

Tax Incentives for Small and Medium-Sized Enterprises – A Misguided Policy Approach?

Inauguraldissertation zur Erlangung des akademischen Grades eines Doktors der Wirtschaftswissenschaften der
Universität Mannheim

vorgelegt von

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Mündliche Prüfung: 28. April 2017

Acknowledgements

First of all, I would like to thank my supervisor Prof. Dr. Christoph Spengel, who gave me the opportunity to write this doctoral thesis and who – on an academic as well as on a personal level – has provided me with the best possible support during the last four years. I am particularly grateful for the special working environment he has created, which was immensely conducive to the development of my ideas and at the same time made it a pleasure to come to work. I would also like to thank Prof. Dr. Johannes Voget for the second revision of the thesis and for the valuable help and advice he has provided.

Next, I would like to thank my co-authors Rainer Bräutigam, Maria Theresia Evers, Prof. Dr. Jost Heckemeyer, Prof. Dr. Christoph Spengel and Heiko Vay for their invaluable contributions to this thesis. In particular, I cherish the common work with Jost Heckemeyer, whose ideas and advice were crucial for the success of my dissertation. Special thanks also go to Matthias Backes who proofread this impudently long thesis and who helped me a lot with his remarks. Even more importantly, he showed me that anything can happen on a Thursday and made my dissertation time a blast. In this regard, I would also like to thank Hannah Nusser, Christoph Schober and all other colleagues for the pleasant yet productive years. However, it would not have been the same experience without my four-year office mate Ina Meier who endured all my moods and who laughed about the good as well as the bad jokes. Expectedly, she was the best office mate imaginable and has become a dear friend that I do not want to miss.

Finally, I want to thank my parents Elke and Martin Bergner and my brother Daniel, who are the most important part of my life. Through all my life, they have supported me in any possible way and I know that they will always and under all circumstances be there for me. I cannot express with words how much this means to me and how grateful I am to have them.

Sören Bergner

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List of Abbreviations

a.F.	-	alte Fassung (old version)
Abs.	-	Absatz (paragraph)
AKES	-	closed-end venture capital mutual fund under Greek law
AUT	-	Austria
Balance sh. tot	-	balance sheet total
Bal. sh. tot.	-	balance sheet total
BEL	-	Belgium
BGR	-	Bulgaria
BIS	-	Department for Business, Innovation and Skills
BLG	-	Belgium
CFC	-	controlled foreign companies
CIT	-	corporate income tax
CoC	-	cost of capital
cont.	-	continued
CSES	-	Centre for Strategy & Evaluation Services
ctd.	-	continued
CVAE	-	French corporate tax assessment
CYP	-	Cyprus
CZK	-	Czech crown
CZR	-	Czech Republic
DEN	-	Denmark
DF	-	debt financing
DKK	-	Danish crown
D&B	-	Dun and Bradstreet
EATR	-	effective average tax rate
EBITDA	-	earnings before interest, taxes, depreciation, and amortization
EC	-	European Commission
ed.	-	edition
EEA	-	European Economic Area
EF	-	equity financing
EFI	-	Commission of Experts for Innovation and Research
e.g.	-	exempli gratia
EMTR	-	effective marginal tax rate
ESP	-	Spain

EST	-	Estonia
ESTG	-	Einkommensteuergesetz (German personal income tax code)
et al.	-	and others
EU	-	European Union
EU 13	-	13 EU Member States that joined the European Union between 2004 and 2013
EU 15	-	15 EU Member States that joined the European Union before 2004
EU 28	-	28 EU Member States that joined the European Union before 2013
EVCA	-	European Private Equity & Venture Capital Association
excl.	-	exclusive
f.	-	and the following page
ff.	-	and the following pages
FCPR	-	venture capital fund under French law
FIFO	-	first in, first out
FIN	-	Finland
FRA	-	France
GBP	-	Great Britain Pound
GDP	-	gross domestic product
GER	-	Germany
GewStG	-	German Trade Tax Act
GmbH	-	German limited liability company
GRE	-	Greece
HM	-	Her Majesty's
HMRC	-	Her Majesty's Revenue and Customs
HRK	-	Croatian kuna
HRV	-	Croatia
HUF	-	Hungarian forint
HUN	-	Hungary
IAE	-	Impuesto sobre Actividades Economicas (Spanish business activity tax)
IBFD	-	International Bureau of Fiscal Documentation
i.e.	-	id est
IES	-	Institute for Employment Studies
IFS	-	Institute for Fiscal Studies
IMF	-	International Monetary Fund

Inc.	-	Incorporated
incl.	-	including
IP	-	intellectual property
IRAP	-	Imposta regionale sulle attività produttive (Italian regional production tax)
IRE	-	Ireland
IRS	-	Internal Revenue Service
ITA	-	Italy
KfW	-	Kreditanstalt für Wiederaufbau (German bank)
KG	-	Kommanditgesellschaft (German partnership)
KStG	-	Körperschaftsteuergesetz (German corporate income tax code)
LIFO	-	last in, first out
LIT	-	Lithuania
LTL	-	Lithuanian litas
LTV	-	Latvia
m.	-	million
MAL	-	Malta
M&A	-	mergers and acquisitions
max.	-	maximum
MDAX	-	Mid-Cap DAX (German stock index for mid caps)
MFI	-	monetary financial institutions
NED	-	Netherlands
NESTA	-	National Endowment for Science, Technology and the Arts
no.	-	number
NPV	-	Net Present Value
OECD	-	Organization for Economic Cooperation and Development
p.	-	page
pp.	-	pages
PLN	-	Polish zloty
POL	-	Poland
POR	-	Portugal
PIT	-	personal income tax
R&D	-	research and development
ROM	-	Romania
SA	-	société anonyme (French corporation)
SASU	-	société par actions simplifiée unipersonnelle (French single-person corporation)

SBA	-	Small Business Administration
SCR	-	venture capital company under French law
SDAX	-	Small-Cap DAX (German stock index for small caps)
SE	-	Societas Europaea
SEK	-	Swedish krona
SF	-	self-financing
SICAR	-	société d'investissement en capital à risqué investment (French company for risk capital, private equity and venture capital investments)
SLV	-	Slovenia
SME	-	small and medium-sized enterprise
SUIR	-	société unipersonnelles d'investissement à risques (French single-person investment company for risk capital, private equity and venture capital investments)
SVK	-	Slovak koruny
SWE	-	Sweden
thsd.	-	thousand
TSO	-	The Stationary Office
UK	-	United Kingdom
UKD	-	United Kingdom
U.S.	-	United States
U.S.C.	-	Code of Laws of the United States of America
VAT	-	value-added tax
VC	-	venture capital
VCC	-	venture capital company
VCF	-	venture capital fund
VCT	-	venture capital trust
Vol.	-	volume
vs.	-	versus
ZEW	-	Centre for European Economic Research

1. Introduction

1.1 Subject and Purpose of the Thesis

Recently, public discussions on tax policy have mainly centered around profit shifting activities by large, multinational firms.¹ The majority of businesses, however, is made up of small and medium-sized enterprises (SMEs). In the European Union, they account for 99.8% of all businesses and 67% of total employment.² Moreover, SMEs are widely perceived to be the engine of growth and innovation for the economy.³ Accordingly, the European Commission (EC) regards the “capacity to build on the growth and innovation potential of small and medium-sized enterprises” to be incremental for the future prosperity of the European Union (EU).⁴ The creation of a “world-class environment for SMEs” has thus become a major goal of the European Commission.⁵

While the need of an attractive business environment for SMEs is widely agreed upon, it is less apparent how to create it. SMEs face disadvantages with regard to financing, competition failures and disproportionate regulatory burdens compared to large enterprises. An attractive business environment minimizes the impact of these obstacles and aims at providing a level playing field for firms of all sizes, industries and legal forms.⁶ Taxation is an important component of the regulatory framework in which businesses operate. It constitutes a major, inevitable cost factor for all businesses. For policy-makers, taxation is a particularly interesting feature of the business environment as it can be directly influenced and controlled through legislation.⁷ Occasionally, however, tax legislation⁷ is excessively and inappropriately utilized to compensate for problems not related to taxation and the creation of a neutral and efficient tax system takes a back seat.⁸

¹ See Fuest/Spengel/Finke/Heckemeyer/Nusser (2013) pp. 307 ff.; OECD (2013a) pp. 9 ff.

² See European Commission (2015a) p. 7.

³ See Bundesministerium für Wirtschaft und Energie (2014) p. 2; European Commission (2013) pp. 3 f.; OECD (2009a) p. 22.

⁴ See European Commission (2008) p. 2.

⁵ See European Commission (2008) p. 2. SMEs were again prominently featured in the Commission’s *2020 Strategy* as a key driver of smart, sustainable and inclusive economic growth. The special focus of some of the EC’s flagship initiatives on SMEs as well the *Annual Reports on the Performance of SMEs* constitute further indicators for SMEs’ perceived significance in the European Union. See European Commission (2010a) pp. 10 ff.; European Commission (2015a) pp. 7 ff.

⁶ See European Commission (2013) pp. 8 ff.; Lee (2014) pp. 183 ff.; BIS (2015) pp. 74 ff.

⁷ See OECD (2009a) pp. 31 ff.; European Commission (2015b) pp. 75 ff.

⁸ See OECD (2001a) pp. 87 ff.

The use of tax incentives specifically targeted at SMEs may be one of these occasions. Preferential treatment for certain groups of taxpayers generally interferes with the neutrality and the efficiency of the tax system and the social benefits of any tax incentive have to be carefully weighed against the related costs.⁹ The adequacy of SME tax incentives thus hinges on the desirable traits of small and medium-sized enterprises and incentives' effectiveness in fostering these traits to the benefit of society as a whole. Policy-makers across Europe apparently consider these two prerequisites to be given as SME tax incentives have become a commonly used policy instrument in Europe as well as the rest of the world.

The thesis at hand analyzes and evaluates the current use of SME tax incentives in the European Union. In this endeavor, three major questions are addressed:

- 1) Which countries do currently employ SME tax incentives and how do they implement them?
- 2) What are the effects of SME tax incentives on eligible enterprises as well as on the economy as a whole?
- 3) Should SME tax incentives be used and if so, how can they be designed adequately?

The overall goal of the thesis is to provide policy-makers with clear-cut advice on the usage of special tax treatments for micro, small and medium-sized enterprises. At best, the analysis reinforces the role of scientific evidence in the public debate on SME tax incentives and helps to base future actions on economic rationale rather than heuristics and public misconceptions.

1.2 *Outline of the Thesis*

The following analysis starts in Chapter 2 by discussing different approaches to defining and identifying the group of small and medium-sized enterprises. An uncomplicated and inexpensive identification of SMEs is especially relevant in the context of taxation as eligibility needs to be monitored by tax administrations for a large number of taxpayers. Section 2.2 continues with a brief description of the main design dimensions along which the different forms of SME tax incentives need to be distinguished. This distinction is the foundation of an adequate evaluation of SME tax incentives as the different types vary significantly

⁹ See Klemm (2010) p. 324.

in their merits and their shortcomings. Closing the second chapter, the most important requirements for well-designed tax incentives are presented. These properties constitute the assessment criteria for the following analysis and provide a framework for the systematic evaluation of the pros and cons of SME incentives.

Chapter 3 comprises an overview of currently available tax incentives in the EU as well as a quantitative analysis of their impact on effective tax burdens. The qualitative analysis aims in particular at identifying and evaluating common practices with regard to the types of available incentives and the ways in which taxpayers are targeted. The quantitative analysis builds hereon and provides further insight on the actual size of the reliefs. For this purpose, effective tax burdens are calculated with the help of the European Tax Analyzer, a widely acknowledged program that permits the detailed simulation of the development of a model company and its tax burden.

In Chapters 4 and 5, the general appropriateness of SME tax incentives as a policy tool is assessed by reviewing the arguments presented in their favor and by examining the costs of SME-specific regimes. Among the narratives supporting the use of tax incentives, two lines of argumentation need to be distinguished: The SME sector is either argued to make particularly valuable contributions to the economy that need to be reinforced (mostly due to market failure) or tax incentives are considered to be a compensation for disadvantages faced by SMEs as a consequence of their size, especially with regard to regulatory requirements. The costs of SME tax incentives, on the other hand, arise as eligibility for preferential tax treatment is restricted to businesses of a certain size or a certain legal form. These restrictions incentivize firms to choose into the respective size classes or legal forms in order to gain access to tax benefits. Sections 5.1 and 5.2 empirically test, if and to what extent these distortions really occur before Section 5.3 summarizes the results of the empirical analyses and provides a brief overview of other potential costs arising from SME tax incentives.

Chapter 6 concludes the main part and shifts the focus from tax incentives specifically targeted at SMEs to the design of an investment-friendly tax system for the entirety of enterprises including SMEs. The development of the German tax code is taken as a case study that exemplifies how recent trends in business taxation have affected the investment environment for large as well as for small and medium-sized entities. The case study centers around two reforms in 2001 and 2008 whose goals explicitly included improved investment condi-

tions for the so-called *Mittelstand*.¹⁰ The main changes of these reforms are presented and their impact is measured with the help of effective tax rates based on the neoclassical model by Devereux and Griffith.¹¹ Based on the findings, recommendations for the development of a neutral, investment friendly tax system are provided. These recommendations focus on the specific needs of SMEs but – in contrast to the majority of currently available SME tax incentives – do not pursue a partitioning of taxpayers that inevitably introduces distortions to the tax system.

Lastly, Chapter 7 concludes and summarizes the main findings of the thesis.

1.3 Co-Authors and Publication Status of Projects

Parts of this monograph have originally been written for publication in journals and other outlets. They are the work of multiple authors. Table 1 informs about the different co-authors and the publication status for each paper. In addition, the key contributions of the author of this monograph are highlighted.

¹⁰ See Deutscher Bundestag (2000) p. 92; Deutscher Bundestag (2007) pp 1 ff.

¹¹ For a detailed description of the model, see Sections 6.3 and 6.4.3.1 as well as Devereux/Griffith (1999) pp. 7 ff. and Devereux/Griffith (2003) pp. 109 ff.

Table 1: Co-authors and publication status of projects

Project	Section	Co-authors	Publication status	Own key contributions
Tax Incentives for Small and Medium-Sized Enterprises in the European Union	1, 3 & 4	Rainer Bräutigam Maria Theresia Evers Christoph Spengel	Discussion Paper	<ul style="list-style-type: none"> • introduction and positioning of the paper • analysis of effective tax burdens • analysis of policy rationale for SME tax incentives • summarizing assessment of SME tax incentives as a policy instrument
Taxpayer Bunching Around Thresholds for SME Tax Incentives	5.1	Heiko Vay	Discussion Paper (in preparation)	<ul style="list-style-type: none"> • introduction and positioning of the paper • research and description of institutional background • empirical analysis including bunching estimates and matching analysis • analysis and summarizing assessment of economic implications of taxpayer bunching
Simplified Tax Accounting and the Choice of Legal Form	5.2	Jost H. Heckemeyer	Accepted in <i>European Accounting Review</i>	<ul style="list-style-type: none"> • introduction and positioning of the paper • research and description of institutional background • empirical analysis including difference-in-difference analysis, panel analysis and robustness checks • interpretation of results and derivation of economic implications
Investitionswirkungen der deutschen Unternehmensbesteuerung im internationalen Vergleich: eine Analyse vor dem Hintergrund der Steuerreformen 2001 und 2008 unter Berücksichtigung grenzüberschreitender Investitionen	6	Christoph Spengel	Published in <i>Zukunftsfähigkeit in den Mittelpunkt – Jahresgutachten 2015/16</i> (Sachverständigenrat zur Begutachtung der gesamtwirtschaftlichen Entwicklung)	<ul style="list-style-type: none"> • introduction and positioning of the study • research and presentation of institutional background • description of Devereux/Griffith model • analysis and interpretation of effective tax rates

2. Design of Tax Incentives for Small and Medium-Sized Enterprises

2.1 Definition of Small and Medium-Sized Enterprises

As a first step in the design of SME tax incentives as well as in the discussion of their appropriateness, it needs to be defined what an SME is. Perceptions of the terms SME or small business vary significantly. While some may only consider the very smallest businesses with an owner-manager and no or very few employees to be small, others could also view the companies listed in the SDAX or even the MDAX as part of this group. Which businesses are considered small (or medium-sized) is highly dependent on the specific context and the purpose of the definition.¹²

With regard to the design of SME tax incentives, precise, clear-cut definition criteria for targeted businesses need to be formulated in order to provide taxpayers as well as tax administrations with legal certainty.¹³ In this respect, either qualitative or quantitative indicators can be referred to in order to distinguish SMEs from their larger counterparts. Given the structural differences in firm characteristics across industries and countries, quantitative criteria bear the risk of introducing substantial arbitrariness to the size classification of enterprises, in particular around the respective thresholds on employment, turnover and other measures.¹⁴ Moreover, quantitative indicators are susceptible to accounting policies and tax planning.¹⁵ Qualitative or “economic” criteria may thus be the more adequate and versatile instrument for distinguishing small from large entities.¹⁶

The existence of actively managing owners is a qualitative feature of many small businesses that is especially important for business taxation. It determines the nature of the business owner’s income as well as her opportunities for shifting income between different tax bases.¹⁷ Hence, it may be sensible to refer to active and passive owners when differentiat-

¹² See Crawford/Freedman (2010) p. 1029; Gale/Brown (2013) p. 872.

¹³ See Crawford/Freedman (2010) p. 1035.

¹⁴ An enterprise with a certain turnover, for example, may be considered large in the personal service sector but rather small for a manufacturer. For a detailed discussion of the relation between industry characteristics and firm size, see Kumar/Rajan/Zingales (2001) pp. 11 ff.

¹⁵ Several studies have recently shown taxpayers to bunch below thresholds at which eligibility for tax benefits expires. See, for example, Saez (2010) pp. 180 ff.; Chetty/Saez (2013) pp. 1 ff.; Kleven/Waseem (2013) pp. 669 ff.

¹⁶ See Bolton (1971) p. 1.

¹⁷ In contrast to passive owners of enterprises, an owner-manager derives business and labor income from the business which can have implications for applicable tax rates and allowances. As a consequence, he can design contracts in ways that allow him to minimize his personal tax liability. By means of legal form choice, for example, business profits can be assigned to either corporate or personal income taxation. Owner-managers can also

ing between small and large businesses in taxation. While appealing in theory, this approach raises difficulties in practice as tax administrations will have trouble to separate actively managing owners from those owners only pretending to do so.¹⁸ Moreover, owner-managed firms are not necessarily small in terms of employment, market power and other relevant indicators.¹⁹ Since tax incentives mostly aim at compensating for market failures and disadvantages arising from being small,²⁰ they would be misdirected in many situations if solely based on the distinction of active and passive owners.

Legal form is another proxy for firm size that is discussed in the literature and referred to in tax codes. Evidentially, firm size and the propensity to incorporate are positively correlated.²¹ Similarly to active ownership, however, legal form is not an accurate indicator to target small businesses when designing tax incentives. Despite the proven correlation, there are numerous examples of large non-corporate entities as well as small businesses being corporations.²² In addition, taxpayers who can hardly be considered business owners regularly take the legal form of a sole proprietorship or a partnership.²³ SME tax incentives building exclusively on legal form to restrict eligibility for tax incentives would inadvertently benefit these taxpayers, too.

Apparently, easy-to-track qualitative indicators do not provide the required accuracy in identifying small businesses as neither the owner's involvement in management nor legal form are properties that can be exclusively attributed to small businesses. The same problem occurs for other indicators such as being listed on a stock exchange or being part of a corporate group.²⁴ On the other hand, qualitative proxies offering a more precise identification (e.g.,

more easily reclassify business income to be either labor income or capital income in the form of interest payments, dividends or capital gains. See Jacobs/Scheffler/Spengel (2015) pp. 99 f.

¹⁸ See Crawford/Freedman (2010) pp. 1035 f.

¹⁹ Some of Germany's largest enterprises, for example the *Dr. August Oetker KG* and the *Schwarz Beteiligungs*, are managed or were managed by their (co-)owners.

²⁰ See Holtz-Eakin (1995) pp. 390 ff.

²¹ This pattern is caused by the non-tax benefits connected to incorporation that become increasingly important as an enterprise expands, e.g., limited liability, facilitated risk diversification and formalized governance structures. See Fama/Jensen (1983a) pp. 304 ff.; Fama/Jensen (1985) pp. 109 ff.; MacKie-Mason/Gordon (1997) pp. 484 ff.

²² The largest non-corporate entities in Germany, for example, include the *Dr. August Oetker KG*, the *Tengelmann Warenhandels-gesellschaft KG* and the *Miele & Cie. KG*.

²³ Such taxpayers may be people pursuing their hobbies or certain kinds of consultants not really conducting an independent business. See Gale/Brown (2013) p. 873.

²⁴ See Bolton (1971) pp. 1 f.; Crawford/Freedman (2010) pp. 1035 f.; Guenther (2009) p. 1 ff.

market share²⁵ or market power²⁶) are not reliably observable and verifiable at reasonable costs for taxpayers and tax administrations. There is a trade-off between accuracy and feasibility when identifying small (and medium-sized) businesses. This trade-off cannot be solved adequately by qualitative criteria alone. Hence, in terms of legal certainty, it seems inevitable to use quantitative indicators when defining and verifying eligibility for size-related tax incentives for a large number of taxpayers.

The most prominent and widely used SME definition in Europe has been established by the European Commission.²⁷ It employs three quantitative criteria to distinguish four different size classes. Enterprises are classified as either micro, small, medium-sized or large according to their number of employees, annual turnover and balance sheet totals (see Table 2). According to the SME definition by the European Commission, enterprises need to meet the employment threshold and either the turnover threshold or the maximum balance sheet total to be assigned to the respective size category.²⁸ Tying the classification to turnover *or* balance sheet total accounts – at least partly – for industry-specific characteristics. Retailers, for example, can still be classified in the same category as comparable service providers despite having a higher average turnover.²⁹ Arbitrariness is introduced by the use of absolute thresholds, though. Deeming an enterprise to be large just because turnover amounts to € 50.1 million instead of € 50 million appears questionable, especially as accounting numbers can be managed by businesses. On the other hand, referring to relative thresholds (i.e., defining certain percentiles of the business population to be small) does not seem to be a feasible option either due to restrictions in data availability. In addition, relative thresholds introduce arbitrariness as well as a firm’s size classification would depend on the size and the development of the market it operates in. Given these drawbacks, relative measures would also impair the transparency of the classification because enterprises can neither estimate their “ranking” *ex ante* nor *ex post*.

²⁵ See Bolton (1971) p. 1.

²⁶ See 15 U.S.C. § 632 (a) (1).

²⁷ The European Commission first published a Commission recommendation on the definition of small and medium-sized enterprises in 1996. Since then the recommendation has been followed by several updates. The following discussion is based on the most recent definition provided by the Commission recommendation of May 6, 2003. Furthermore, the Commission has issued an updated user guide to the SME definition in 2015 that is also drawn upon. See European Commission (1996) pp. 4 ff.; European Commission (2003) pp. 36 ff.; European Commission (2015c) pp. 1 f.

²⁸ See European Commission (2003) p. 39.

²⁹ Retailers usually incur lower profit margins than other sectors such as the service sector and the manufacturing sector. Data on average net margins for the U.S. as well as Europe, Japan and emerging markets can be accessed through the Damodaran Online database that is provided by Aswath Damodaran: http://pages.stern.nyu.edu/~adamodar/New_Home_Page/datafile/margin.html (retrieved on May 8, 2016).

Table 2: SME definition by the European Commission

Category	Number of employees	Turnover	Balance sheet total
Micro	< 10	≤ € 2 million	≤ € 2 million
Small	< 50	≤ € 10 million	≤ € 10 million
Medium	< 250	≤ € 50 million	≤ € 43 million

Besides the abovementioned quantitative criteria, the SME definition by the European Commission also includes provisions on related parties. An enterprise must not own 25% or more of the capital or the voting rights of potentially related parties to be considered independent. Furthermore, no external party must hold 25% or more of the capital or the voting rights of the enterprise.³⁰ If these requirements are not met, the thresholds for employment, turnover and balance sheet total apply for the whole group of enterprises instead of the stand-alone entity.³¹

In the United States (U.S.), the U.S. Small Business Administration (SBA) uses a different approach to identify so-called small businesses that are eligible for federal government programs. While the standards also refer to annual receipts, the number of employees and total assets³², only one of the indicators applies to each industry. In fact, the industry code of a firm not only determines the relevant indicator but also the applicable threshold. In the manufacturing sector, for example, the number of employees is the primary measure whereas in the service sector annual receipts decide about the small business status. The exact thresholds vary between 100 and 1,500 employees and \$ 0.75 million and \$ 38.5 million, respectively.³³ The U.S. approach is clearly more refined as far as industry-specific firm characteristics are concerned. This, however, increases complexity in the identification of size classes. Moreover, the U.S. standard does not distinguish micro, small and medium-sized enterprises from each other.

³⁰ Exceptions apply to certain kinds of investors such as venture capital investors, business angels, institutional investors or public bodies.

³¹ See European Commission (2015c) pp. 16 f.

³² Total assets are only considered for the banking sector.

³³ See SBA (2016) pp. 2 ff.

The definitions by the European Commission and the SBA are both designed to provide simple, easy-to-verify size classifications for SME-specific policies.³⁴ With regard to tax incentives, employment, turnover and assets are operationally suitable indicators as they are obtained in the ordinary tax assessment process. Their usage thus minimizes the administrative costs related to potential SME tax incentives.³⁵ Nevertheless, international tax codes also employ other criteria such as taxable income, book equity and the number of shareholders to target size-related tax incentives and treatments.³⁶ While these indicators show similar administrative features as the aforementioned indicators, they are likely to introduce even more arbitrariness to the size classification of enterprises. Whether a firm is considered to be small, for example, should rather depend on the absolute amount of capital raised than the mere number of shareholders. Book equity, on the other hand, not only depends on size but also on the forms of financing chosen and the profitability of a firm. The same is true for taxable income as even the largest enterprises may only have minimal or even negative taxable income. Incentives solely based on profits may therefore lead to misdirected incentives. Moreover, taxable income is particularly susceptible to manipulation as it is the calculation base of income taxation and thus the primary target of tax planning and tax avoidance activities by taxpayers.³⁷

Altogether, the indicators chosen by the European Commission and the SBA in their definitions of SMEs – employment, turnover and total assets – appear to be the most reliable measures to identify micro, small and medium-sized enterprises. They can be measured and verified at reasonable costs which also makes them attractive from an administrative point of view. The same combination of an economically sensible classification at comparably low costs can neither be provided by other quantitative indicators nor by qualitative criteria.³⁸ The definition of rigid absolute thresholds naturally comes along with arbitrariness, though. *Small* is a relative, somewhat ambiguous term.³⁹ Consequently, there is no point in arguing for either the EC thresholds or the SBA thresholds. Both sets of thresholds have their pros and

³⁴ See European Commission (1996) p. 4; SBA (2016) p. 1.

³⁵ Minor differences may occur between financial accounts and tax accounts. Tax incentives should therefore explicitly refer to tax accounts.

³⁶ See Section 3.1 for a comprehensive overview of available SME tax incentives and related eligibility criteria.

³⁷ See Allingham/Sandmo (1972) pp. 323 ff. The other quantitative indicators, however, are – at least to a certain degree – also manageable as was shown by several studies on bunching behavior of taxpayers around eligibility thresholds. See Onji (2009) pp. 766 ff.; Almunia/Rodriguez-Lopez (2016) pp. 1 ff. For a comprehensive analysis of bunching behavior at eligibility thresholds for SME tax incentives, also see Section 5.1.

³⁸ See CSES (2012) p. 15.

³⁹ See Crawford/Freedman (2010) p. 1035.

cons. With regard to the European approach, however, legislators should keep in mind that using uniform values across all industries and countries of the European Union is a simplification. Depending on the respective industry dynamics and domestic price levels, the given thresholds have different implications for different sectors and countries.⁴⁰ Moreover, it needs to be pointed out that the adequacy of the European Commission's SME definition for sorting and categorizing enterprises does not imply or confirm the general desirability of a size-based partitioning of taxpayers.

Still, the remainder of this thesis will take the European Commission's definition as a starting point. The analysis will focus on the group of enterprises that are deemed SMEs by this definition and the tax incentives targeted at them. Consequently, the terms micro, small and medium-sized enterprise as well as SME as a collective term will be used in accordance with the European Commission's definition if not stated otherwise. It is also important to note that the term SME only relates to the size of a business. It is not a synonym for entrepreneurial firms or family businesses although the latter two groups of enterprises primarily consist of small and medium-sized businesses.⁴¹

2.2 *Typology of SME Tax Incentives*

Tax incentives are special provisions of the tax code granting preferential treatment to certain activities, investments or taxpayers.⁴² With regard to SME tax incentives, the preferential treatment takes many forms and available options for policy-makers can be broadly categorized along the lines of three key dimensions:

- 1) *Level of taxation*: Does the incentive apply on the level of the enterprise or does it benefit the business owner upon extracting income from the business? This distinction primarily applies to businesses that are not taxed transparently (i.e., corporations, limited liability companies and – in some countries – certain forms of partnerships). In the case of transparently taxed entities (i.e., sole proprietors and partnerships), the two levels cannot be distinguished.

⁴⁰ The European Commission, being the responsible standard-maker, should also adjust the thresholds on a regular basis for productivity growth and inflation. See CSES (2012) p. 1.

⁴¹ See Hurst/Pugsley (2011) pp. 84 ff.; Kachaner/Stalk/Bloch (2012) pp. 103 f.

⁴² See Zee/Stotsky/Ley (2002) p. 1498; Klemm (2010) pp. 315 f.

- 2) *Tax liability vs. compliance costs*: Does the incentive address the actual tax liability or does it address the compliance costs that are related to the process of determining and settling the tax liability?
- 3) *Input vs. output-based incentives*: Does the size of the relief depend on the amount and/or the kind of inputs invested within the enterprise or does it depend on the outcome the investment generates (i.e., taxable income)? Input-based tax incentives include special depreciation schemes, investment allowances and tax credits while special tax rates, exemptions and tax holidays constitute the most common output-based measures.

In addition to the abovementioned three dimensions, further options arise in the design of SME tax incentives with regard to the specific design of the respective incentive types⁴³ or with regard to additional eligibility restrictions not relating to firm size. Such restrictions refer to firm age (i.e., only new or young firms), location (i.e., only enterprises in certain regions), time (i.e., incentives only available for a certain period) and the sort of activity performed by the taxpayer (i.e., only businesses in a certain industry). Most importantly, however, incentives differ with regard to their way of targeting SMEs. They can either *explicitly* or *implicitly* target firms of a certain size. Explicit SME incentives use clear-cut thresholds on quantitative size criteria (e.g., turnover) whereas implicit measures achieve a preferential treatment of SMEs in other ways. For example, limiting the absolute amount of available reliefs can induce disproportional advantages for SMEs without explicitly excluding large entities. If the caps are chosen appropriately, the relief only makes up a small amount of large businesses' overall tax liability whereas small enterprises benefit more in relative terms.⁴⁴

For the purpose of this analysis, the term SME tax incentive is defined very broadly as any kind of special tax treatment that is particularly beneficial for enterprises within the SME spectrum given by the European Commission.⁴⁵ This includes all benefits either emanating from schemes that are exclusively applicable to SMEs (explicit incentives) as well as those provisions that are especially advantageous for SMEs despite being generally applicable to all enterprises (implicit incentives).

⁴³ Input-based incentives, for example, may be incremental or volume-based, i.e., they only apply to investments exceeding a certain base amount or to the investment amount as a whole. Such features relating to specific incentive types are discussed in more detail in Section 3.1.

⁴⁴ For a more detailed discussion of implemented designs, eligibility criteria and practical examples from the EU Member States, see Section 3.

⁴⁵ See European Commission (2003) pp. 36 ff.

2.3 *Requirements for Adequate Tax Incentives*

The design of the tax system is crucial for attaining the maximum level of social welfare while also generating sufficient revenues to cover the public budget. In this balancing act, equity, simplicity, efficiency and neutrality are the most important guiding principles.⁴⁶ Obviously, the provision of tax incentives for particular groups of taxpayers per se violates these principles.⁴⁷ Their implementation makes tax codes more complex and impacts on economic decision-making.⁴⁸ Moreover, an exclusive group of taxpayers is favored over other, ineligible individuals and businesses. This is contradictory to the principles of horizontal as well as vertical equity.⁴⁹

Mostly, the correction of market failure is drawn on to justify such violations.⁵⁰ According to this rationale, the benefits of removing or alleviating the effects of dysfunctions in the market outweigh the abovementioned disadvantages.⁵¹ In order to actually achieve and maximize a net benefit, tax incentives should generally exhibit four essential characteristics:

- 1) *Effectiveness*: Above all, tax incentives need to effectively eliminate or at least alleviate the effects of the friction they are intended to address and achieve the economic betterment expected from the removal of the friction.⁵² In order to ensure the effectiveness of an incentive, it is especially important to document why the incentive is implemented and how it is thought to address the underlying friction. Furthermore, the attainment of the goals needs to be monitored once the incentive is implemented so that adjustments can be made if necessary.⁵³ With regard to SMEs, proponents bring forward a multitude of reasons for the use of tax incentives. They can be boiled down to two main arguments, though. First, there is not as much investment in SMEs as would be optimal for overall social welfare. Second, SMEs are put at a structural competitive disadvantage by the legal and institutional framework that would not oc-

⁴⁶ See Arginelli (2015) pp. 10 ff.; Hansson/Brokelind (2014) pp. 170 ff.

⁴⁷ See Klemm (2010) p. 324.

⁴⁸ See Van Parys/James (2010) p. 401; Klemm/Van Parys (2012) p. 394.

⁴⁹ See Shah (1995) p. 6; Hansson/Brokelind (2014) pp. 183 f.

⁵⁰ Tax incentives for research and development (R&D) and related spillover effects as well as tax incentives supporting environment-friendly investments due to negative externalities are examples of market failures that have induced tax incentives. The attraction of foreign direct investment, regional development and employment creation are further motives for support schemes that have been named by policy-makers and researchers. See Shah (1995) pp. 4 ff.; Holland/Vann (1998) pp. 1004 ff.; Bondonio/Greenbaum (2007) pp. 121 ff.

⁵¹ See Shah (1995) pp. 6 ff.; Zee/Stotsky/Ley (2002) p.1501.

⁵² See Spengel/Müller-Rees/Endres/Harhoff/Heinemann/Hellwig/Hüther/Regierer/Schön/Stein (2009) p. 84.

⁵³ See Storey (2014) pp. 28 ff.

cur in the absence of regulatory requirements.⁵⁴ Adequate SME tax incentives should thus prevent underinvestment in SMEs and help to minimize competitive disadvantages of SMEs emanating from the regulatory framework.

- 2) *Simplicity and transparency*: The minimization of compliance and administrative costs is best achieved through simple provisions that are easy to understand and comply with for taxpayers and easy to verify for tax administrations.⁵⁵ Simplicity is especially important in the context of SME tax incentives as small businesses face disproportionately high compliance burdens.⁵⁶ Transparency is another requirement closely related to simplicity. Taxpayers need to be able to reliably estimate the benefits they receive and to adequately account for them in investment decisions.⁵⁷ As decision-makers are usually risk-averse and incur costs in understanding complex legislation, the effect of an incentive is likely to increase in the certainty about available benefits.⁵⁸ Besides the actual design, transparency is also influenced by the persistence of an incentive over time. Frequent changes in the availability and the magnitude of provided support are therefore detrimental to the transparency and the effectiveness of an incentive.⁵⁹ Transparency also helps the government to reliably account and plan for losses in tax revenues and to adjust accordingly.⁶⁰
- 3) *Neutrality*: The provision of special tax treatment for a certain group of enterprises hurts the neutrality of the overall tax system.⁶¹ Tax incentives, however, should be designed in ways that keep the distortions to a minimum. The choice of legal form and financing, for example, should not be influenced. Hence, the size of the relief for eligible enterprises should not depend on legal form or capital structure.⁶² Moreover,

⁵⁴ See Section 4 for a comprehensive discussion of potential reasons to support SMEs.

⁵⁵ See Holland/Vann (1998) pp. 998 ff.

⁵⁶ The disproportionate compliance burden for small businesses is due to the large share of fixed costs. For an extensive review of the literature on compliance costs, see Eichfelder (2010) pp. 50 ff.

⁵⁷ There are three main dimensions of transparency. First, the legal and regulatory dimension that grants a high degree of certainty about the support to taxpayers. Second, the economic dimension demands a clear economic justification of the incentives, which also needs to be communicated to the public. Last, the administrative dimension of transparency demands the amount of discretion of administrations in the granting of support to be minimal. See Zee/Stotsky/Ley (2002) p. 1502.

⁵⁸ See Derregia/Chittenden (2007) p. 7; Bal (2014) p. 65.

⁵⁹ See Shah (1995) p. 9; Spengel/Müller-Rees/Endres/Harhoff/Heinemann/Hellwig/Hüther/Regierer/Schön/Stein (2009) p. 82.

⁶⁰ See Bal (2014) p. 69; European Commission (2015b) pp. 150 f.

⁶¹ See Klemm (2010) p. 324.

⁶² See Spengel/Müller-Rees/Endres/Harhoff/Heinemann/Hellwig/Hüther/Regierer/Schön/Stein (2009) p. 84; European Commission (2015b) pp. 150 f.

investment decisions of eligible businesses should not be altered but only facilitated. And most importantly with regard to SME tax incentives, businesses must not be prevented from growth as eligibility for an incentive is on the line.⁶³

4) *Efficiency*: This criterion refers to the relationship of the outcomes and the costs of a tax incentive. The benefits do not only have to exceed the costs but the incentive also needs to be the most efficient way to achieve the desired outcome, i.e., there must neither be another instrument to accomplish the same effect at lower costs nor measures attaining better results at the same costs.⁶⁴ In this regard, precise targeting of eligible taxpayers is crucial as it ensures intended businesses to gain access to the incentive while also minimizing unintended benefits for other taxpayers – those who do not require support or already receive it from other sources.⁶⁵ So SME tax incentives need to target the right businesses that exhibit the desired characteristics while also avoiding misuse by other enterprises in order to limit the losses in tax revenue.⁶⁶ Moreover, the implementation costs on the side of the tax administration and the compliance costs of taxpayers need to be kept at a minimum.⁶⁷ The same applies for the social costs emanating from rent-seeking and corruption.⁶⁸ As an incentive's effectiveness determines the outcomes of a regime while the costs are primarily driven by its simplicity and its neutrality, efficiency constitutes a summary measure of the above three criteria.

The above characteristics constitute the basis for the following analysis of SME tax incentives. The criteria and requirements may in part be conflicting, though. Incentives affecting eligible businesses strongly, for example, are also likely to pose a bigger threat to the investment neutrality of the tax system as more generous reliefs come along with more discrimination against ineligible investments. Moreover, the precision of the targeting of eligible enterprises usually increases in the complexity of provisions. Anti-avoidance rules in particular

⁶³ The problem of taxpayers bunching below thresholds beyond which marginal tax rates increase has recently been shown by numerous studies. For SME tax incentives that naturally apply size thresholds, the problem is especially relevant. See Section 5.1 for a detailed analysis of the subject as well as an overview of prior literature.

⁶⁴ Importantly, adequate tax incentives need to be more efficient than other forms of tax incentives and more efficient than other non-tax measures (e.g., direct subsidies). See Thuronyi (1988) pp. 1186 ff.; Busom/Corchuelo/ Martinez-Ros (2014) p. 571 ff.; Hansson/Brokelind (2014) pp.176 f.

⁶⁵ See Zee/Stotsky/Ley (2002) p.1502; Crawford/Freedman (2010) pp. 1075 ff.

⁶⁶ See Holland/Vann (1998) pp. 988 ff.

⁶⁷ See Holland/Vann (1998) pp. 988 ff.; Zee/Stotsky/Ley (2002) p.1502; Holland/Vann (1998) pp. 988 ff.

⁶⁸ See Klemm (2010) p. 322.

make provisions more complicated and have the adverse effect of raising related compliance costs for SMEs, thus reducing the effective relief for eligible businesses.⁶⁹ Well-designed support schemes need to balance the conflicting goals appropriately. If and how preferential tax treatment can do this more adequately than other policy instruments with regard to SMEs is the key question in the evaluation of SME tax incentives.

⁶⁹ See Holland/Vann (1998) p. 989; Crawford/Freedman (2010) p. 1077; Van Parys/James (2010) p. 401.

3. SME Tax Incentives in the European Union

The following section takes a first step in the evaluation of SME tax incentives and discusses currently available regimes in the European Union. Specifically, Section 3.1 starts with the qualitative analysis of the status quo. A comprehensive overview of the incentives as available for taxpayers in 2015 is provided and the main design features and their benefits as well as their disadvantages are discussed. On the firm level, input-based and output-based measures are distinguished before continuing with shareholder-level measures and purely administrative reliefs. Building on the results of the qualitative analysis, the firm-level incentives are examined quantitatively. Using the European Tax Analyzer, a simulation program developed at the Centre for European Economic Research, effective tax burdens for micro, small and medium-sized enterprises are derived. Showing the impact of SME tax incentives as a function of firm size as well as other firm characteristics such as profitability and capital intensity allows important conclusions on the importance of the respective regimes for enterprises as well as on the possibly distortionary effects. Lastly, Section 3.3 summarizes the main findings of the qualitative and the quantitative analysis.

3.1 Overview of Available Regimes

3.1.1 Input-Based Tax Incentives on the Firm Level

3.1.1.1 Accelerated Depreciation

Input-based tax incentives base the preferential tax treatment on the amount and the kind of investments made by eligible taxpayers. They can be offered on the enterprise level as well as on the shareholder level. The latter is less common, though.⁷⁰ The general idea behind these schemes is to reward investment itself rather than privileging the returns derived from the investment. If the incentive applies as intended, the relief is incurred early in the investment cycle and provides taxpayers with a high degree of certainty about the size of the relief as it is granted irrespective of the success of the project. Within the group of input-based incentives, measures relating to the tax base and measures relating to the tax due need to be distinguished. *Accelerated depreciation* schemes belong to the former. They allow taxpayers to deduct acquisition costs of depreciable assets from taxable income earlier than usual during

⁷⁰ All forms of SME incentives being provided on the shareholder level are discussed in Section 3.1.3 while this section focuses on those incentives applying on the firm level.

the assets' useful life. The total amount of allowances, however, does not change and the overall (inter-periodic) income is not reduced either, but only accrues in later years. Businesses incur a pure interest advantage and improved liquidity in the early investment stages.⁷¹

The effect of accelerated depreciation increases in the level of interest rates as well as the level of the applicable tax rate. This leads to two major disadvantages. First, loss-making firms do not benefit, at least not immediately when the relief is granted (unless they can offset additional losses). Accelerated depreciation therefore tends to favor profitable, high-performance enterprises while neglecting the weakest, least profitable businesses.⁷² Second, schemes of accelerated depreciation provide heterogeneous support among profitable businesses due to differences in marginal tax rates. Such differences may occur between entities subject to the personal and the corporate income tax and between businesses of the same legal form being subject to different progressive rates.⁷³ As a consequence, depreciation schemes are not neutral with regard to legal form and they discriminate against the least profitable businesses.⁷⁴ The heterogeneity in effects is also detrimental to the transparency of the respective tax incentives, thereby making it more difficult to adequately account for the incentives in investment decisions as well as in public budget planning.

Notwithstanding these disadvantages, six EU countries use special depreciation schemes in 2015 (see Table 3⁷⁵). Belgium and Spain even offer two separate regimes. The available regimes differ with respect to the affected depreciable assets, the generosity of the scheme and applicable eligibility criteria:

⁷¹ See Zee/Stotsky/Ley (2002) p. 1505.

⁷² See Klemm (2010) p. 326.

⁷³ Progressive tax rates apply to transparently taxed businesses in most European countries. Moreover, several countries feature progressive elements in the tax rate schedule of the corporate income tax rate. See Section 3.1.2.1 for an overview of tax rates on personal and corporate business income in the European Union.

⁷⁴ See Holtz-Eakin (1995) p. 389.

⁷⁵ All eligibility thresholds given in Tables 3 to 10 are reported as stated in the respective national tax codes (not necessarily in €). For corresponding amounts in €, see the country reports in Annex 1.

Table 3: Special depreciation schemes for SMEs in the EU (2015)

Country	Eligible assets	Depreciation scheme	Eligibility (firm/investment size)	Other related provisions
Belgium	<ul style="list-style-type: none"> depreciable assets acquired additional costs related to the acquisition of depreciable assets 	<ul style="list-style-type: none"> full-year depreciation in year of acquisition (irrespective of exact acquisition date) 100% in year of acquisition 	<ul style="list-style-type: none"> no. of employees ≤ 50; turnover \leq € 7.3 million; balance sh. tot \leq € 5 million; profits \leq € 322,500 no. of employees ≤ 50; turnover \leq € 7.3 million; balance sh. tot \leq € 3.65 million; profits \leq € 322,500 	<ul style="list-style-type: none"> none none
Germany	<ul style="list-style-type: none"> depreciable movable assets acquired 	<ul style="list-style-type: none"> 20% of acquisition costs in year of acquisition (additional to usual depreciation; depreciation in following years adjusted accordingly) 	<ul style="list-style-type: none"> net assets \leq €235,000 	<ul style="list-style-type: none"> none
Hungary	<ul style="list-style-type: none"> machinery, equipment and certain vehicles (no cars) 	<ul style="list-style-type: none"> 100% of acquisition costs in year of acquisition 	<ul style="list-style-type: none"> no. of employees ≤ 250; turnover \leq € 50 million; balance sh. tot \leq € 43 million 	<ul style="list-style-type: none"> only in certain disadvantaged regions
Lithuania	<ul style="list-style-type: none"> depreciable assets acquired except for buildings 	<ul style="list-style-type: none"> free depreciation 	<ul style="list-style-type: none"> no. of employees ≤ 10; taxable income \leq € 150,000 	<ul style="list-style-type: none"> further restrictions on ownership structure in place
Poland	<ul style="list-style-type: none"> depreciable assets acquired except for land, buildings and passenger cars 	<ul style="list-style-type: none"> 100% of acquisition costs in year of acquisition 	<ul style="list-style-type: none"> turnover (incl. VAT) \leq € 1,2 million 	<ul style="list-style-type: none"> maximum eligible acquisition costs: €50,000
Spain	<ul style="list-style-type: none"> depreciable tangible fixed assets and intangible assets acquired depreciable tangible assets acquired if unitary value \leq € 601.01 	<ul style="list-style-type: none"> twice the normal rate free depreciation 	<ul style="list-style-type: none"> turnover \leq € 10 million turnover \leq € 10 million 	<ul style="list-style-type: none"> none only if increase in personnel in the 24 months following the acquisition maximum free depreciation per year: € 12,020.24 maximum eligible assets per year: € 120,000

- *Eligible assets*: In each country implementing accelerated depreciation, machinery and equipment are eligible for the regimes whereas buildings, for which accelerated depreciation would be particularly advantageous due to high acquisition costs and low ordinary rates of depreciation, are excluded in four out of six countries. Further exclusions include intangible assets and cars. One of the regimes in Spain only applies to small-scale acquisitions with a unitary value below € 601. The generosity of the incentives as well as losses in tax revenue are thereby limited. The exclusion of cars probably refers to the concern of supporting private acquisitions of the entrepreneur.
- *Depreciation scheme*: Four regimes grant either immediate or free depreciation. One regime doubles the annual depreciation rate while in Germany eligible businesses can deduct an additional 20 percent of acquisition costs in the year of the acquisition. Belgium merely grants immediate expensing of incidental acquisition costs and the full-year allowance in the year of acquisition irrespective of the exact date of acquisition.
- *Eligible enterprises*: Three regimes are only accessible for micro enterprises. The two Spanish regimes only include micro and small enterprises and three regimes support all SMEs. The latter, however, are either negligible with respect to the relief granted (Belgium) or restricted to so-called disadvantaged areas (Hungary).

All in all, Spain is the only country to provide depreciation-based relief for a broad range of assets to other firms than the very smallest micro businesses. The regimes in Germany, Lithuania and Poland seem to address established micro enterprises with a need for expansion or replacement investments.⁷⁶ It is questionable, however, in how far they help in overcoming liquidity constraints given the low tax rates for micro companies (e.g., 5% in Lithuania) and the limited acceleration of depreciation (an additional 20% of acquisition cost in Germany). The regime in Belgium should be considered more of a simplification than a substantial tax cut while the Hungarian regime is a generous but purely regional incentive that is unlikely to address the actual needs of less developed regions (e.g., adequate infrastructure, skilled labor).

⁷⁶ Start-ups often do not have positive taxable income to be offset by increased depreciation. Hence, they are probably not the primary focus of accelerated depreciation.

In general, the regimes of accelerated depreciation as implemented throughout Europe do not show very favorable properties with regard to simplicity and efficiency. Their complexity causes considerable compliance and administrative costs while the relief provided seems limited for most firms.⁷⁷ The usefulness of the regimes appears especially doubtful as they overlap with other incentives (e.g., the special SME tax rate in Lithuania, the investment allowance in Germany), which adds additional complexity. Furthermore, it remains unclear why Spain needs a scheme for small-scale investments when the respective assets are already covered by a more broadly applicable regime.⁷⁸ The additional relief provided by the second depreciation scheme can hardly be expected to incentivize businesses to hire additional personnel as it seems to be intended. Lastly, the effectiveness of the depreciation schemes is questionable as the businesses facing the most severe financing constraints benefit the least. Instead, the schemes tend to promote those companies which are not in need of additional funds as they generate sufficient profits.

3.1.1.2 Investment Allowances

Investment allowances (also called super-deductions), in contrast to special depreciation schemes, allow the deduction of a fixed percentage of eligible expenditures (e.g., personnel costs, costs of newly acquired assets) or balance sheet positions (e.g., shareholders' equity, special investment reserves) on top of the general allowances provided by the tax code.⁷⁹ Unlike the schemes of accelerated depreciation, they decrease overall inter-periodic taxable income and induce a true reduction of tax payments instead of a pure interest advantage.⁸⁰ As for depreciation schemes, however, the reduction of the tax burden depends on the profitability and the marginal tax rate of eligible taxpayers. As a consequence, loss-making firms do not benefit if no refunds are available and if there are no opportunities to offset additional losses. Moreover, the extent of the relief again depends on the legal form and applicable marginal tax rates, which is detrimental to the predictability of expected reliefs (and also tax rev-

⁷⁷ In Germany, for example, the amount of additional liquid funds induced by the tax savings in the year of acquisition equals 6% of the acquisition costs of the underlying asset, given the maximum additional depreciation of 20% is deducted at an applicable tax rate of 30% ($0.2 * 0.3 = 0.06$).

⁷⁸ In Spain, a scheme of accelerated depreciation applies for all depreciable assets. The second regime allowing free depreciation for small-scale investments only applies under additional conditions demanding an increase in the number of employees over the previous two years (see Table 3).

⁷⁹ See Zee/Stotsky/Ley (2002) p. 1504.

⁸⁰ See Klemm (2010) p. 317.

venues on the side of tax administrations).⁸¹ All in all, investment allowances therefore show similar negative properties with regard to neutrality, simplicity and transparency as depreciation schemes.

Nonetheless, investment allowances for SMEs are offered in eight countries of the EU in 2015 (see Table 4). Notably, Belgium and Hungary have implemented several allowances, which results in a total of 13 regimes. The schemes differ substantially with regard to the firms being eligible as well as the calculation bases and the generosity of the relief. Five out of 13 regimes privilege all SMEs whereas the other schemes exclusively refer to micro and small companies.⁸² In Croatia, Poland and the United Kingdom (UK), large enterprises incur similar allowances as SMEs but can only deduct a smaller share of eligible expenditure. The Netherlands, in contrast, do not tie eligibility to firm size but to the volume of eligible investments in so-called small-scale fixed assets. Hence, large entities are not generally excluded but effectively benefit less due to the regressive nature of the scheme.⁸³ Germany, Hungary and the UK use caps on maximum deductible expenditures in addition to explicit size criteria. From an administrative point of view, these complementary restrictions cause additional compliance effort without having a substantial effect.⁸⁴ Comparing the Dutch regime that only restricts eligibility by limiting the amount of eligible expenditures with the other schemes, the approach used in the Netherlands appears superior. Firms are not as much discouraged from outgrowing some size category as large businesses are not explicitly excluded. Instead, the relative advantageousness of the scheme only vanishes gradually as the investment volume increases.⁸⁵ On the other hand, caps on maximum annual reliefs may introduce distortions between investments below and beyond the respective thresholds. Enterprises could, for example, delay or elongate investments.⁸⁶

⁸¹ Progressive tax rates apply to transparently taxed businesses in most European countries. Moreover, several countries feature progressive elements in the tax rate schedule of the corporate income tax rate. See Section 3.1.2.1 for an overview of tax rates on personal and corporate business income in the European Union.

⁸² The size criteria of the UK R&D allowance even correspond to 200% of the thresholds given by the European Commission to define medium-sized enterprises.

⁸³ Full relief is only granted for eligible investments up to € 55,248; no relief is offered if investments exceed € 306,931.

⁸⁴ In Germany, for example, very few enterprises with less than € 235,000 of net assets can be expected to make investments of more than € 200,000.

⁸⁵ The Dutch regime creates a so-called kink where only the marginal treatment takes a jump. The other regimes create notches at the thresholds as the average treatment is discontinuous. Empirical evidence has proven that taxpayers react much stronger to notches than to kinks. See Saez (2010) pp. 180 ff.; Chetty/Saez (2013) pp. 1 ff.; Kleven/Waseem (2013) pp. 669 ff.

⁸⁶ As an alternative, some regimes may therefore feature regressive schedules, for which the marginal relief only decreases beyond a certain threshold instead of completely ceasing to apply. Potential distortions in the timing of

Among the available allowances, all but one scheme are volume-based.⁸⁷ The volume-based approach is conducive to the amount of additional investments induced⁸⁸ and the simplicity of the incentives. In view of SMEs' disproportionate compliance burden and the high number of potentially eligible businesses, this seems to be the appropriate choice from an administrative point of view. The approach, however, also causes significantly higher losses in tax revenue and does not differentiate between growth firms and SMEs remaining small. Substantially more heterogeneity among the 13 SME investment allowances exists with regard to eligible expenditures. Six of them generally refer to investments in fixed assets (Belgium (2), Germany, Hungary, Netherlands, Poland). The seven allowances not relating to investments in fixed assets are based on very heterogeneous calculation bases. Two of them support equity financing (Belgium, Portugal) and two grant relief when additional employees are hired. Other targeted expenditures or activities include the hiring of disabled people (Hungary), cost for education and training (Croatia), investments in safety measures (Belgium) and expenditures on R&D (UK). The actual reliefs provided by the regimes and the scope of application are usually subject to significant limitations, though (e.g., due to regional restrictions, low percentages of deductible expenditure, low absolute thresholds on maximum allowances, restriction to the very smallest firms). Most firms therefore do not or only marginally benefit from the regimes. The basic problems relating to the effectiveness and the efficiency of the allowances are therefore similar to those of the abovementioned depreciation schemes: The available incentives appear to have a limited impact while causing a substantial amount of complexity and administrative effort for taxpayers as well as tax administrations. Moreover, the size of the relief depends on the marginal tax rate of a taxpayer, which leads to discrimination between enterprises of different legal forms. Loss-making firms usually do not benefit at all, as refunds are generally denied (applies to all regimes except for the UK R&D allowance). In Belgium, even carry-forwards of unused allowances are limited.

investments would thus be alleviated but not fully removed. Such regimes can be found for R&D tax incentives, e.g., in Finland, France, Italy, the Netherlands and Portugal. These incentives are not included in Table 4, though, because the thresholds on eligible expenditures are too high for the incentives to be clearly targeted at SMEs. The incentives, however, are described in the country reports in Annex 1.

⁸⁷ Volume-based schemes determine the size of the allowance as a percentage of the total amount of expenditures meeting the given definition of eligible expenditures. As an alternative, incremental designs only consider the amount of eligible expenses as far as a certain base amount, mostly the average from previous years, is exceeded. The latter approach targets marginal investments more precisely and is less costly with regard to forgone tax revenues. Compliance and administrative costs, though, increase significantly. See Hansson/Brokelind (2014) pp. 177 f.; Arginaelli (2015) pp. 27 f.

⁸⁸ See Castellacci/Lie (2015) p. 827.

Table 4: Special investment allowances for SMEs in the EU (2015)

Country	Calculation basis	%	Eligibility (firm/investment size)	Eligibility (other criteria)	Other related provisions
Belgium	• depreciation of newly acquired fixed assets	10.5%	• no. of employees < 20	• only non-corporate entities	• limited carry forward (€ 946,800 or 25% if unused part > € 3,787,210)
	• share capital + retained earnings	0.5%	• no. of employees ≤ 50; turnover ≤ € 7.3 million; balance sh. tot ≤ € 3.65 million; profits ≤ € 322,500	• none	• no carry forward
	• investments in safety measures	20.5%	• no. of employees ≤ 50; turnover ≤ € 7.3 million; balance sh. tot ≤ € 3.65 million; profits ≤ € 322,500	• none	• limited carry forward (€ 946,800)
	• acquisition costs of assets acquired or produced in 2015	4%	• no. of employees ≤ 50; turnover ≤ € 7.3 million; balance sh. tot ≤ € 3.65 million; profits ≤ € 322,500	• none	• no combination with notional interest deduction
Croatia	• costs for education and training	20%/10%	• no. of employees ≤ 250; turnover ≤ € 50 million; balance sh. tot ≤ € 43 million	• none	• allowances (20% for small and 10% for medium-sized companies) granted on top of investment allowance (60%) for large enterprises
Germany	• future acquisition costs of depreciable fixed assets	40%	• net assets ≤ € 235,000	• purchase of asset within 3 years	• allowance lowers future depreciations on acquired assets • maximum allowance: € 200,000
Hungary	• annual increase in number of employees * minimum wage * 12	100%	• micro enterprises with no. of employees < 5	• no outstanding tax liability at year end	• none
	• investment expenses for putting certain business assets to use		• SMEs owned by individuals	• none	• max. deduction HUF 30 million

Country	Calculation basis	%	Eligibility (firm/investment size)	Eligibility (other criteria)	Other related provisions
Hungary (cont.)	<ul style="list-style-type: none"> wages to employees with disability (at least 50% disabled) up to statutory minimum wage 	200%	<ul style="list-style-type: none"> number of employees < 20 	<ul style="list-style-type: none"> none 	<ul style="list-style-type: none"> none
Netherlands	<ul style="list-style-type: none"> acquisition costs of small-scale fixed assets lump-sum deduction 	28.0% € 18,467	<ul style="list-style-type: none"> sum of eligible investments ≤ € 55,248 only individual entrepreneurs 	<ul style="list-style-type: none"> exclusion of certain assets (land, dwelling houses, private cars) pre-approval of tax authorities required 	<ul style="list-style-type: none"> allowance phases out beyond threshold of € 55,745 (0% if eligible investments > € 306,931) carry back for 3 years and carry forward for 9 years
Poland	<ul style="list-style-type: none"> max {investment costs; two-year personnel costs of employees newly hired for purpose of investment} 	20%/10%	<ul style="list-style-type: none"> no. of employees ≤ 250; turnover ≤ € 50 million; balance sh. tot ≤ € 43 million 	<ul style="list-style-type: none"> only in special economic zones assets / new jobs must be maintained for 3 years 	<ul style="list-style-type: none"> allowances (20% for small, 10% for medium-sized companies) granted on top of investment allowance (50%) for large enterprises
Portugal	<ul style="list-style-type: none"> capital contributions upon incorporation / capital increases 	5%	<ul style="list-style-type: none"> no. of employees ≤ 250; turnover ≤ € 50 million; balance sh. tot ≤ € 43 million 	<ul style="list-style-type: none"> only companies owned by individuals and venture capital investors 	<ul style="list-style-type: none"> none
UK	<ul style="list-style-type: none"> R&D expenditures 	100%	<ul style="list-style-type: none"> no. of employees ≤ 500; turnover ≤ € 100 million; balance sh. tot ≤ € 86 million 	<ul style="list-style-type: none"> none 	<ul style="list-style-type: none"> allowance granted on top of investment allowance (30%) for large enterprises cash refund for loss-making companies (14.5% of the loss caused by deduction) and for SMEs as far as allowance exceeds taxable income maximum relief: £ 7.5 million

Still, investment allowances are a popular policy tool in supporting SME investments. Concerns about losses in tax revenue, however, seem to prevent the use of allowances for a wide range of investments and enterprises. Instead, the schemes are mostly tied to numerous restrictions making the incentives overly complex but negligible with regard to the relief provided and the scope of application. The heterogeneity in SME allowances across Europe also indicates the lack of a generally accepted, well-founded rationale behind the regimes. And even if some of the underlying policy goals are legitimate, it appears questionable why the hiring of disabled persons or investments in safety, education and training measures should be supported only in SMEs.

3.1.1.3 Tax Credits

Tax credits (or investment tax credits) represent an alternative form of input-based incentive that circumvents some of the problems related to tax allowances. Tax credits are also calculated as a fixed percentage of eligible expenditures or balance sheet positions. They are directly subtracted from the tax liability, though. Hence, tax credits are more generous if the same percentage of the same calculation basis is deducted.⁸⁹ The size of the relief does not depend on the tax rate and even loss-making taxpayers can benefit if refunds are granted or deductions from other taxes than the income tax are permitted.⁹⁰ This makes tax credits a more transparent and neutral instrument than tax allowances and depreciation schemes.⁹¹ Given that SMEs occur in a wide variety of legal forms and are more likely to incur losses than large firms, tax credits should therefore be considered the most suitable form of input-based tax incentive for supporting small and medium-sized enterprises.

⁸⁹ See Zee/Stotsky/Ley (2002) pp. 1504 f.

⁹⁰ The creditable amount could, for example, be subtracted from the payroll tax which needs to be paid by loss-making businesses (with employees) as well. See Spengel (2009) p. 272; Netherlands Enterprise Agency (2016) p. 2.

⁹¹ See Spengel/Müller-Rees/Endres/Harhoff/Heinemann/Hellwig/Hüther/Regierer/Schön/Stein (2009) pp. 96 f.

Table 5: Special tax credits for SMEs in the EU (2015)

Country	Calculation basis	%	Eligibility (firm/investment size)	Eligibility (other criteria)	Other related provisions
France	<ul style="list-style-type: none"> depreciation of newly acquired fixed assets 	20%	<ul style="list-style-type: none"> no. of employees ≤ 250; turnover \leq € 50 million; balance sh. tot \leq € 43 million 	<ul style="list-style-type: none"> none 	<ul style="list-style-type: none"> maximum eligible expenditure: € 400,000 immediate refund available
	<ul style="list-style-type: none"> acquisition costs of depreciable assets (e.g., machinery and equipment used for manufacturing) 	20%	<ul style="list-style-type: none"> no. of employees ≤ 250; turnover \leq € 40 million 	<ul style="list-style-type: none"> only in Corsica owned by at least 75% by individual shareholders or other SMEs 	<ul style="list-style-type: none"> carryforward for 9 years; 50% refund available after 9 years (35% after 5 years); immediate refund for new companies
	<ul style="list-style-type: none"> income tax payable (eligible share depends on increase in personnel expenses and the company's average effective tax rate of last year)⁹² 	0%-100%	<ul style="list-style-type: none"> $20 \leq$ no. of employees ≤ 250; turnover \leq € 50 million; balance sh. tot \leq € 43 million no. of employees \geq no. of employees in each of previous 2 years * 1.15 	<ul style="list-style-type: none"> none 	<ul style="list-style-type: none"> none
Hungary	<ul style="list-style-type: none"> interest paid on loans from financial institutions 	60%	<ul style="list-style-type: none"> no. of employees ≤ 250; turnover \leq € 50 million; balance sh. tot \leq € 43 million investments \geq HUF 500 million 	<ul style="list-style-type: none"> not available for companies in transportation sector and agriculture 	<ul style="list-style-type: none"> maximum credit HUF 6 million
Latvia	<ul style="list-style-type: none"> investment costs for newly founded companies 	20%/10%	<ul style="list-style-type: none"> 20%: no. of employees ≤ 50; turnover \leq € 10 million; balance sh. tot \leq € 10 million 10%: no. of employees ≤ 250; turnover \leq € 50 million; balance sh. tot \leq € 43 million 	<ul style="list-style-type: none"> none 	<ul style="list-style-type: none"> credit granted on top of credit for large enterprises (35%) maximum overall credit: 80% of actual tax liability

⁹² The eligible share of the income tax payable is calculated as follows: eligible percentage = [min {15%; (increase in personnel expenses / 15%)} – average CIT paid in previous year].

Country	Calculation basis	%	Eligibility (firm/investment size)	Eligibility (other criteria)	Other related provisions
Malta	<ul style="list-style-type: none"> capital expenditure or wages of eligible employees for 24 months 	20% / 10%	<ul style="list-style-type: none"> 20%: no. of employees ≤ 50; turnover ≤ € 10 million; balance sh. tot ≤ € 10 million 10%: no. of employees ≤ 250; turnover ≤ € 50 million; balance sh. tot ≤ € 43 million 	<ul style="list-style-type: none"> newly founded companies and major extensions of establishment only certain activities (e.g., manufacturing, R&D, software) investment needs to stay in Malta for 3 years 	<ul style="list-style-type: none"> maximum eligible investment: € 50 million credit granted on top of credit for large enterprises (15%) unlimited carry forward but no refund alternative cash grant possible for business extensions (not for new ventures)
	<ul style="list-style-type: none"> deductible costs (e.g., personnel costs, current costs, overhead, capital expenditure/depreciation) 	20%/10%	<ul style="list-style-type: none"> 20%: no. of employees ≤ 50; turnover ≤ € 10 million; balance sh. tot ≤ € 10 million 10%: no. of employees ≤ 250; turnover ≤ € 50 million; balance sh. tot ≤ € 43 million 	<ul style="list-style-type: none"> costs must be incurred for research projects 	<ul style="list-style-type: none"> credit granted on top of credit for large enterprises (25-65%) maximum credit: actual tax liability; but: indefinite carryforward (with inflation adjustment)
	<ul style="list-style-type: none"> certain costs (e.g., wages of new employees, refurbishing costs, expenditure for machinery and equipment) 	45%	<ul style="list-style-type: none"> 1 ≤ no. of employees ≤ 30; turnover ≤ € 10 million 	<ul style="list-style-type: none"> companies must not be part of a group and be registered for VAT 	<ul style="list-style-type: none"> maximum eligible expenses: € 30,000 (€ 50,000 for start-ups) increased credit (65%) for companies in the region of Gozo
Poland	<ul style="list-style-type: none"> acquisition costs of innovative technology 	75%	<ul style="list-style-type: none"> no. of employees ≤ 250; turnover ≤ € 50 million; balance sh. tot ≤ € 43 million investment ≤ € 50 million 	<ul style="list-style-type: none"> none 	<ul style="list-style-type: none"> maximum credit: PLN 4 million; further regional aid limits (up to 70% of tax liability; depends on company size)
Portugal	<ul style="list-style-type: none"> expenditure for R&D (capital expenditure other than land and buildings, operating costs, personnel costs) 	15%	<ul style="list-style-type: none"> no. of employees ≤ 250; turnover ≤ € 50 million; balance sh. tot ≤ € 43 million 	<ul style="list-style-type: none"> only new SMEs (less than 2 years of operation) 	<ul style="list-style-type: none"> credit granted on top of credit for large enterprises (32.5%) carry forward for 6 years
	<ul style="list-style-type: none"> retained earnings 	10%	<ul style="list-style-type: none"> no. of employees ≤ 250; turnover ≤ € 50 million; balance sh. tot ≤ € 43 million 	<ul style="list-style-type: none"> credited amount needs to be reinvested within 2 years 	<ul style="list-style-type: none"> maximum credit: the lower € 5 million and 25% of income tax liability

Country	Calculation basis	%	Eligibility (firm/investment size)	Eligibility (other criteria)	Other related provisions
Spain	<ul style="list-style-type: none"> no. of new employees under 30 years of age with indefinite employment contract 	€ 3,000 per employee	<ul style="list-style-type: none"> no. of employees ≤ 50; turnover ≤ € 10 million 	<ul style="list-style-type: none"> none 	<ul style="list-style-type: none"> none
	<ul style="list-style-type: none"> outstanding unemployment payments of newly and indefinitely hired employees (max. 1 year) 	50%	<ul style="list-style-type: none"> no. of employees ≤ 50; turnover ≤ € 10 million 	<ul style="list-style-type: none"> none 	<ul style="list-style-type: none"> none

In 2015, six Member States of the European Union provide tax credits targeted at SMEs (see Table 5). France, Malta, Portugal and Spain have multiple regimes in place.⁹³ In contrast to special depreciation schemes and tax allowances, the available tax credits are mostly applicable to micro, small *and* medium-sized enterprises (9 out of 12).⁹⁴ Three of the regimes are even accessible for large enterprises at lower creditable rates. With regard to the purpose of the schemes, four tax credits are tied to SME investments in fixed assets. Further tax credits are granted for hiring new personnel (5 regimes), which suggests that policy-makers expect employment in SMEs to be particularly sensitive to tax incentives. Alternatively, jobs in SMEs may be considered superior to those in large enterprises or the restriction of employment tax credits to SMEs is simply due to budget-related constraints and EU provisions on state aid.⁹⁵ Further areas addressed by tax credits in the EU include R&D, innovation and financing. Interestingly, one regime credits the costs of debt financing (Hungary) whereas another one supports self-financing by granting a credit on reinvested retained earnings (Portugal).

In general, similar design patterns as for investment allowances are noticeable among tax credits. Provisions are volume-based except for two schemes basing benefits on increased employment (France, Spain). With regard to low-profit and loss-making firms, only France grants refunds. The size criteria used to identify eligible SMEs for input-based incentives mostly correspond to the criteria given in the SME definition by the European Commission (i.e., number of employees, turnover, balance sheet total).⁹⁶ The specific thresholds may differ, though. In addition to size restrictions, most tax credits also feature further eligibility criteria. Three regimes, for example, are exclusively for new ventures and major business extensions (Latvia, Malta, Portugal) while others are limited to certain industries or types of investment (R&D, innovative technology). Moreover, available reliefs are capped for half of the schemes in addition to the explicit firm size criteria already restricting eligibility.

Altogether, tax credits appear to be the type of input-based measure that can best satisfy the requirements for adequate tax incentives. In particular, they show superior properties

⁹³ One of the French tax credits is limited to SMEs on Corsica, though.

⁹⁴ One regime in France even explicitly excludes micro and very small firms.

⁹⁵ EU regulation prohibits the provision of targeted support for certain enterprises or groups of enterprises that would give them an advantage over their competitors unless they are justifiable by reasons of general economic development. SMEs are considered to be of special importance for the economy and can therefore be granted certain forms of support that would not be permitted for large entities. See European Commission (2009) pp. 3 ff.

⁹⁶ See European Commission (2003) p. 39.

with regard to transparency and neutrality. In practice, the potential advantages of tax credits are not fully taken advantage of, though. Refunds are mostly denied and carry forwards are restricted. The enterprises requiring the most support, i.e., those with losses and low profits, therefore benefit the least from actually available tax credits. Moreover, investment allowances – despite their disadvantages – are still common practice in Europe, which can only be explained by fiscal and administrative considerations. In addition, several other trends in the design of current input-based tax incentives for SMEs appear questionable. Almost all measures refer to explicit size criteria, mostly the number of employees, turnover and total assets. While providing easy-to-track eligibility criteria, such thresholds provide strong incentives to remain small or at least to appear small with the help of tax planning. An indirect targeting by restricting maximum available reliefs would create fewer distortions. Lastly, many regimes introduce a disproportionate amount of complexity. This is due to the numerous restrictions and anti-misuse provisions that come along with most regimes. The multitude of available regimes in some countries further enhances the overall complexity even further.

3.1.2 Output-Based Tax Incentives on the Firm Level

3.1.2.1 Special Tax Rates

In contrast to tax allowances and tax credits, output-based tax incentives tie the provision of a relief to the output generated by an investment rather than the investment itself, i.e., the profits derived from the business's sale of goods and services.⁹⁷ Special tax rates imposed on SME income are the most common type of output-based SME incentives. Exemptions and tax holidays represent alternative forms.

Depending on their legal form, enterprises are subject to different tax rates. While incorporated businesses adhere to the schedule of the corporate income tax (CIT), sole proprietors apply personal income tax (PIT) rates to their business income.⁹⁸ Differences between corporate and personal income tax rates exist in 26 out of 28 countries in the European Union. Such a tax wedge already constitutes an advantage for small businesses as they can choose

⁹⁷ See Arginelli (2015) p. 29.

⁹⁸ The taxation of partnerships depends on the particular form of partnership and their treatment in the respective country. Mostly, they are taxed transparently and subject to the personal income tax rate. See Spengel/Schaden/Wehrße (2010) pp. 44 ff.

their legal form in a way that minimizes applicable tax rates.⁹⁹ Non-tax costs and benefits of incorporation, of course, need to be considered as well, but small entities can be assumed to be comparatively flexible in their legal form decision. Large businesses, in contrast, usually have no choice but to become a corporation.¹⁰⁰

In 22 out of 28 EU countries, progressive personal income tax rates apply to the business income of sole proprietors and owners of other transparently taxed entities (see Table 6). Although progressive PIT rates are usually not intended to support SMEs, they are disproportionately beneficial for owners of small-scale undertakings compared to larger entities (given that there is a positive correlation between firm size and absolute profits). CIT rates, in contrast, are mostly proportional.¹⁰¹ For the provision of SME tax incentives by means of special tax rates, differences in PIT and CIT rate schedules represent an obstacle as policymakers can hardly address businesses of all legal forms equally. Even if the special rates are offered to corporate and non-corporate businesses alike, the incentive effect differs as the relative advantage is not the same.¹⁰² The neutrality of such measures with regard to homogeneous treatment among eligible businesses is therefore not ideal. Moreover, business income of individuals is taxed jointly with other types of income such as employment income or income from professional services in many countries. Special tax rates for transparently taxed entities, i.e., benefits beyond the usually progressive rates, would thus require far-reaching adjustments to personal income taxation.¹⁰³

⁹⁹ Croatia and Poland even grant non-corporate businesses the option to be taxed like a corporate entity. Denmark and Germany provide the opportunity to apply a reduced rate on retained profits in order to align the taxation of corporate and non-corporate businesses (see Table 6).

¹⁰⁰ See Jacobs/Scheffler/Spengel (2015) p. 6.

¹⁰¹ All countries not applying strictly proportional CIT rates are displayed in Table 7.

¹⁰² See European Commission (2015b) p. 61.

¹⁰³ In fact, a separate taxation of business income would have to be introduced. This would entail tax planning opportunities through the re-declaration of other income types as business income. Complex anti-avoidance provisions as well as significantly increased administrative costs would most likely be inevitable. Moreover, a potentially preferential taxation of business income may be subject to intense public scrutiny. See Sachverständigenrat zur Begutachtung der gesamtwirtschaftlichen Entwicklung [Sachverständigenrat] (2003) pp. 333 ff.; Crawford/ Freedman (2010) pp. 1039 ff.

Table 6: Personal income tax rates on business income in the EU (2015)

Country	PIT rate on business income	Options for alternative treatment of (non-corporate) business income	Other taxes on (non-corporate) business income	Top rate
Austria	<ul style="list-style-type: none"> – up to € 11,000: 0% – € 11,000 to € 25,000: 36.5% – € 25,000 to € 60,000: 43.2143% – over € 60,000: 50% 			50%
Belgium (Brussels)	<ul style="list-style-type: none"> – up to € 8,710: 25% – € 8,710 to € 12,400: 30% – € 12,400 to € 20,660: 40% – € 20,660 to € 37,870: 45% – over € 37,870: 50% – basic allowance: € 7,090 to € 7,380 		<ul style="list-style-type: none"> • municipal surcharge: 0% to 10% (+ 1% in Brussels region) on PIT payable 	53.5%
Bulgaria	– 15%			15%
Croatia (Zagreb)	<ul style="list-style-type: none"> – up to € 26,400: 12% – € 26,401 to € 158,400: 25% – over € 158,400: 40% 	<ul style="list-style-type: none"> • option for CIT (20%) if: turnover > HRK 3 million and two of the three following conditions met: <ul style="list-style-type: none"> – net income > HRK 400,000 – nr. of employees > 15% – depreciable assets > HRK 200,000 	<ul style="list-style-type: none"> • city surtax: 10% to 18% on PIT liability (depending on size of the municipality) • local business tax: HRK 0 to HRK 2,000 per business unit (HRK 180 to HRK 530 in Zagreb; deductible for PIT) 	47.2%
Cyprus	<ul style="list-style-type: none"> – up to € 19,500: 0% – € 19,501 to € 28,000: 20% – € 28,001 to € 36,300: 25% – € 36,301 to € 60,000: 30% – over € 60,001: 35% 		<ul style="list-style-type: none"> • special contribution on gross monthly earnings (split between employer and employee) <ul style="list-style-type: none"> – up to € 1,500: 0% – € 1,501 to € 2,500: 2.5% – € 2,501 to € 3,500: 3.0% – over € 3,501: 3.5% 	38.5%
Czech Republic	– 15%		<ul style="list-style-type: none"> • surcharge: 7% if income over CZK 1,277,328 	16.05%
Denmark (Copenhagen)	<p>personal income plus net income from capital:</p> <ul style="list-style-type: none"> – up to DKK 43,400: 0% – DKK 43,400 to DKK 459,200: 8.08% – over DKK 459,200: 23.08% 	<ul style="list-style-type: none"> • reduced (preliminary) taxation of retained profits replacing PIT and municipal tax (23.5%) 	<ul style="list-style-type: none"> • health contribution: 4% • municipal income tax on personal income plus capital income less general deductions: 24.9% (average) 	50%

Country	PIT rate on business income	Options for alternative treatment of (non-corporate) business income	Other taxes on (non-corporate) business income	Top rate
Estonia	– 20%			20%
Finland (Helsinki)	– up to € 16,500: 0% – € 16,500 to € 24,700: 6.5% – € 24,700 to € 41,300: 17.5% – € 41,300 to € 71,400: 21.5% – € 71,400 to € 90,000: 29.75% – over € 90,000: 31.75%	<ul style="list-style-type: none"> • 20% of net capital can be deemed to be income from capital 	<ul style="list-style-type: none"> • local income tax: 16.5% to 22.5% (depending on municipality; 18.5% in Helsinki) 	50.25%
France	– up to € 9,690: 0% – € 9,691 to € 26,764: 14% – € 26,765 to € 71,754: 30% – € 71,755 to € 151,956: 41% – over € 151,957: 45% – max. combined rate of PIT, wealth tax, property tax, dwelling tax and additional social contributions: 50%		<ul style="list-style-type: none"> • exceptional contribution on high income: € 250,000 to € 500,000: 3% over € 500,000: 4% 	49%
Germany (Berlin)	– up to € 8,354: 0% – € 8,355 to € 13,469: 14% to 23.97% – € 13,470 to € 52,881: 23.97% to 42% – € 52,882 to € 250,730: 42% – over € 250,730: 45%	<ul style="list-style-type: none"> • reduced (preliminary) taxation of retained profits (28.25%; 25% upon distribution) 	<ul style="list-style-type: none"> • solidarity surcharge: 5.5% on PIT payable • business tax: 7% to over 20% (depending on municipality; 14.35% in Berlin; deductible up to 13.3% for PIT purposes) 	47.79%
Greece	– up to € 50,000: 26% – (up to € 10,000 for start-ups in first 3 years: 13%) – over € 50,000: 33%			33%
Hungary	entrepreneurial income subject to CIT rates and entrepreneurial dividend tax: – up to HUF 500 million: 24.4% (= 10% + 16% * (1 - 0.1)) – over HUF 500 million: 31.96% (= 19% + 16% * (1 - 0.19))	<ul style="list-style-type: none"> • lump-sum deductions • simplified entrepreneurial regime • itemized tax for small businesses 		31.96%
Ireland	– up to € 33,800: 20% – over € 33,800: 40%			40%

Country	PIT rate on business income	Options for alternative treatment of (non-corporate) business income	Other taxes on (non-corporate) business income	Top rate
Italy (Rome)	<ul style="list-style-type: none"> – up to € 15,000: 23% – € 15,001 to € 28,000: 27% – € 28,001 to € 55,000: 38% – € 55,001 to € 75,000: 41% – over € 75,000: 43% 		<ul style="list-style-type: none"> • regional surcharge: 1.23% to 3.33% on income • municipal surcharge: up to 0.9% on income • solidarity contribution: 3% on PIT payable if income over € 300,000 • IRAP: 3.5% on production value (\approx income + interest - net income from shareholdings) 	48.52% (+3.5%)
Latvia	– 23%	<ul style="list-style-type: none"> • taxation on turnover for sole proprietors with less than € 100,000 of turnover and not more than 5 employees: <ul style="list-style-type: none"> – up to € 7,000: 9% – € 7,000 to € 100,000: 12% (9% in first 3 years) – over € 100,000: 20% • special regime for sole proprietors with less than € 50,000 of turnover and no employees: monthly payments of € 43 to € 100 (depending on activity) 		23%
Lithuania	– 15%			15%

Country	PIT rate on business income	Options for alternative treatment of (non-corporate) business income	Other taxes on (non-corporate) business income	Top rate
Luxembourg (City of Luxembourg)	<ul style="list-style-type: none"> – up to € 11,265: 0% – € 11,265 – € 13,173: 8% – € 13,173 – € 15,081: 10% – € 15,081 – € 16,989: 12% – € 16,989 – € 18,897: 14% – € 18,897 – € 20,805: 16% – € 20,805 – € 22,713: 18% – € 22,713 – € 24,621: 20% – € 24,621 – € 26,529: 22% – € 26,529 – € 28,437: 24% – € 28,437 – € 30,345: 26% – € 30,345 – € 32,253: 28% – € 32,253 – € 34,161: 30% – € 34,161 – € 36,069: 32% – € 36,069 – € 37,977: 34% – € 37,977 – € 39,885: 36% – € 39,885 – € 41,793: 38% – € 41,793 – € 100,000: 39% – over € 100,000: 40% 		<ul style="list-style-type: none"> • employment fund contribution: <ul style="list-style-type: none"> – if income below € 150,000: 7% – if income over € 150,000: 9% • temporary tax: 0.5% • municipal business tax: 6.75% on adjusted business profits over € 40,000 (depending on municipality) 	44.1% (+6.75%)
Malta	<ul style="list-style-type: none"> – up to € 8,500: 0% – € 8,501 to € 14,500: 15% – € 14,501 to € 60,000: 25% – over € 60,000: 35% 			35%
Netherlands	<ul style="list-style-type: none"> – up to € 19,822: 36.55% – 19,822 to € 33,589: 42% – 33,589 to € 57,585: 42% – over € 57,585: 52% 			52%
Poland	<ul style="list-style-type: none"> – up to € 3,091: 0% – € 3,091 to € 85,528: 18% – over € 85,528: 32% 	<ul style="list-style-type: none"> • flat rate tax (19%) • tax on turnover at rates from 3% to 20% (depending on activities performed) if turnover < € 150,000 		32%

Country	PIT rate on business income	Options for alternative treatment of (non-corporate) business income	Other taxes on (non-corporate) business income	Top rate
Portugal	<ul style="list-style-type: none"> – up to € 7,000: 14.5% – € 7,000 to € 20,000: 28.5% – € 20,000 to € 40,000: 37% – € 40,000 to € 80,000: 45% – over € 80,000: 48% 	<ul style="list-style-type: none"> • simplified regime: income as a fixed percentage of turnover (15% for most kinds of revenues) for certain activities (e.g., hospitality sector, leisure sector) 	<ul style="list-style-type: none"> • solidarity tax: <ul style="list-style-type: none"> – € 80,000 to € 250,000: 2.5% – over € 250,000: 5% • extraordinary surtax: 3.5% on all income 	56.5%
Romania	– 16%			16%
Slovakia	<ul style="list-style-type: none"> – up to € 35,022.31: 19% – over € 35,022.31: 25% 			25%
Slovenia	<ul style="list-style-type: none"> – up to € 8,021.34: 16% – € 8,021.34 to € 18,960.28: 27% – € 18,960.28 to € 70,907.20: 41% – over € 70,907.20: 50% 	<ul style="list-style-type: none"> • flat rate tax (20%) on notional income (turnover less 80% notional deduction) if turnover < € 50,000 (€ 100,000 with at least one full-time employee for 5 months or more) 		50%
Spain	<ul style="list-style-type: none"> – up to € 12,450: 19% – € 12,450 to € 20,200: 24% – € 20,200 to € 35,200: 30% – € 35,200 to € 60,000: 37% – over € 60,000: 45% 	<ul style="list-style-type: none"> • presumptive taxation based on physical parameters for some activities (e.g., restaurants) 		45%
Sweden (Stockholm)	<ul style="list-style-type: none"> – up to SEK 430,200: 0% – SEK 430,200 to SEK 616,100: 20% – over SEK 616,100: 25% 	<ul style="list-style-type: none"> • reduced (preliminary) taxation of retained profits (22%; taxed as personal earned income when used within business) 	<ul style="list-style-type: none"> • municipal income tax: 29.32% and 35.19% (average 31.99%; 29.86% in Stockholm) 	54.86%
UK	<ul style="list-style-type: none"> – up to GBP 31,785: 20% – GBP 31,786 to GBP 150,000: 40% – over GBP 150,000: 45% 			45%

Tax-rate incentives for SMEs are therefore restricted to corporate taxation for the most part. Currently, eleven out of 28 countries in the European Union use corporate income tax rates favoring small entities over large ones (see Table 7). Three of these countries (Belgium, Hungary, Netherlands) use generally applicable progressive schedules whereas the other seven countries restrict preferential progressive (five regimes) or proportional rates (five regimes) to SMEs.¹⁰⁴ Most of the regimes explicitly excluding large enterprises are limited to either micro (four regimes) or micro and small companies (four regimes). Only two countries include medium-sized entities. Belgium does not exclude large companies explicitly but has implemented a phase out of the progression advantage under which high-profit companies with income over € 322,500 do not benefit at all. In general, preferential tax rates appear to be targeted at the very smallest businesses.

The size of the relief varies widely. While Luxembourg, for example, only grants a relief of 1 percentage point for the first € 15,000 of income, Lithuania reduces the burden to a third of the standard tax rate (5% instead of 15%) for income up to € 300,000. In addition to the reduction of the general corporate income tax rate, France and Portugal apply progressive surcharges. The advantageousness of the micro business regime in Romania depends on businesses' profit margin as the proportional rate of 3% is incurred on turnover instead of net income. Interestingly, businesses cannot opt out of the regime.¹⁰⁵ Hungary is another country providing simplified regimes for micro companies. If their turnover does not exceed HUF 30 million (\approx € 100,000), eligible enterprises can opt for a comprehensive proportional tax of 37% on turnover that replaces all income taxes, the value-added tax (VAT) and the company car tax. If turnover does not even exceed HUF 6 million (\approx € 20,000), lump-sum payments based on the number of employees may be chosen to replace several taxes. Another regime featuring lump-sum payments instead of tax rates can be found in Latvia.¹⁰⁶ In contrast to many input-based tax incentives, preferential tax rates in the EU are only rarely tied to other eligibility criteria than size. Most notably, most regimes require businesses not to be part of a group in order to prevent taxpayers from gaining eligibility through split-ups. Belgium and

¹⁰⁴ Depending on firm size parameters, preferential progressive and proportional schedules can apply for SMEs in Hungary and Spain. The total number of regimes (13) therefore exceeds the number of applying countries (11).

¹⁰⁵ Similar flat-rate taxes on turnover are available in other countries but only for non-corporate entities, e.g., in Poland and Slovenia.

¹⁰⁶ In the European Union, further simplified regimes are available for non-corporate business income. These regimes, however, refer exclusively to the determination of the tax base and do not alter applicable tax rates. They are therefore discussed in Section 3.1.4.

Romania exclude certain activities (e.g., the financial sector) and the UK restricts progressive rates for small corporations to the oil and gas industry. In general, preferential tax rates are tailored to support a broad range of micro and small enterprises, though. It seems, input-based measures are predominantly used to incentivize investments in specific assets, industries and regions whereas preferential tax rates are perceived to be more of a general SME incentive. So why do policy-makers not use the same instruments for general investment incentives and incentives only promoting certain regions or sectors? Most likely, the simplicity of tax-rate incentives becomes increasingly important as the number of targeted taxpayers rises and potential administrative challenges grow.

Summing up, special tax rates for SMEs are a simple, easy-to-track type of incentive that causes only very little additional compliance and administrative costs compared to input-based measures. In the EU, they are currently the primary instrument to provide preferential tax treatment to a broad range of micro and small enterprises. Given the huge number of businesses in these size classes, special tax rates come along with substantial revenue losses, though.¹⁰⁷ Moreover, they are a kind of incentive not showing particularly desirable properties with respect to investment and legal form neutrality¹⁰⁸ – especially given the way in which most schemes in the EU are currently designed. The regimes only support corporate entities and they discriminate against risky investments as particularly successful (high income brackets) and particularly unsuccessful ventures (loss-making) benefit the least from progressive CIT rates.¹⁰⁹ The timing of the relief is not ideal either. Taxpayers can only take advantage when profits are incurred, i.e., when they are likely to have access to sufficient funds for investments anyway. In addition, using taxable income as the nexus of special tax rates does not tie preferential treatment to additional investments and growth (as it is the case for input-based measures) but rather to rent-seeking.¹¹⁰ Preferential tax rates therefore appear inappropriate to foster investments. Eligibility criteria explicitly relating to firm size – as applied for the vast majority of regimes – further discourage growth. In Lithuania, for example, a special tax rate of 5% for enterprises with less than € 300,000 in turnover is unlikely to encourage investments if turnover is thereby raised over the threshold with the consequence of applying a 15% tax rate.

¹⁰⁷ See Zee/Stotsky/Ley (2002) pp. 1503 f.; Hansson/Brokelind (2014) p. 178.

¹⁰⁸ See European Commission (2015b) p. 61.

¹⁰⁹ See Cullen/Gordon (2007) pp. 1479 ff.; Gentry/Hubbard (2005) pp. 87 ff.

¹¹⁰ See Dischinger/Riedel (2011) pp. 691 ff.; Arginelli (2015) pp. 42 f.

Table 7: Special corporate income tax rates for SMEs in the EU (2015)

Country	Standard tax rate	Special tax rate	Eligibility (firm size)	Eligibility (other criteria)
Belgium	<ul style="list-style-type: none"> flat rate: 33% 	<ul style="list-style-type: none"> progressive schedule: <ul style="list-style-type: none"> – 24.25% (€ 0 - € 25,000) – 31% (€ 25,001 - € 90,000) – 34.5% (€ 90,001 - € 322,500) – 33% (income over € 322,500) 	<ul style="list-style-type: none"> none 	<ul style="list-style-type: none"> exclusion of <ul style="list-style-type: none"> – financial companies – collective investment companies – companies owned by other companies by 50% or more – companies whose distributions exceed 13% of paid-in capital – members of groups with a coordination center – companies not paying at least € 36,000 to a director or active partner
France	<ul style="list-style-type: none"> flat rate: 33.33% surcharge: 3.3% (on income tax liability) extra surcharge: 10.7% (on income tax liability before tax credits) flat rate for local business tax on value added (sales – purchases): <ul style="list-style-type: none"> – 1.5% (turnover over € 50 million) 	<ul style="list-style-type: none"> income tax rate: 15% (on first € 38,120 of income) surcharge: 0% extra surcharge: 0% flat rates for local business tax on value added (sales – purchases): <ul style="list-style-type: none"> – 0% (turnover € 0 - € 500,000) – 0-0.5% (turnover € 500,000 - € 3 million) – 0.5-1.4% (turnover € 3 million - € 10 million) – 1.4-1.5% (turnover € 10 million - € 50 million) 	<ul style="list-style-type: none"> turnover \leq € 7,630,000 income tax liability \leq € 763,000 (only for exemption from surcharge) turnover \leq € 250 million see turnover thresholds in column on special tax rates 	<ul style="list-style-type: none"> company must be owned (75%) by individuals or other eligible SMEs none none

Country	Standard tax rate	Special tax rate	Eligibility (firm size)	Eligibility (other criteria)
Hungary	<ul style="list-style-type: none"> progressive schedule: <ul style="list-style-type: none"> – 10% (HUF 0 - HUF 500 million) – 19% (income over HUF 500 million) 	<ul style="list-style-type: none"> flat rate: 37% on turnover incl. VAT (voluntary; replaces income taxes, VAT and company car tax) HUF 50,000 per full-time employee and HUF 25,000 per part-time employee (replaces corporate income tax, social security tax, health care charge and vocational training contribution) flat rate: 16% on accrual income (voluntary; replaces corporate income tax, social security tax and training contribution) 	<ul style="list-style-type: none"> none turnover incl. VAT < HUF 30 million turnover ≤ HUF 6 million (40% tax levied on excess) no. of employees ≤ 25; turnover ≤ HUF 500 million; balance sh. tot ≤ HUF 500 million 	<ul style="list-style-type: none"> none only individuals as shareholders who do not own shares in other companies only companies not subject to excise duties and not selling waste products company must have Hungarian bank account only limited and general partnerships no companies with enforceable tax debt ≥ HUF 1 million
Latvia	<ul style="list-style-type: none"> flat rate: 15% 	<ul style="list-style-type: none"> progressive schedule: <ul style="list-style-type: none"> – 9% (€ 0 - € 7,000) – 12% (€ 7,001 - € 100,000) – 20% (income over € 100,000) 	<ul style="list-style-type: none"> turnover ≤ € 100,000; no. of employees ≤ 5 	<ul style="list-style-type: none"> company must be fully owned by individuals employees must not earn more than € 720 per month
Lithuania	<ul style="list-style-type: none"> flat rate: 15% 	<ul style="list-style-type: none"> flat rate: 5% 	<ul style="list-style-type: none"> taxable income ≤ € 300,000; no. of employees < 10 	<ul style="list-style-type: none"> company must not be owned (50% or more) by shareholders also owning a sole proprietorship or other companies

Country	Standard tax rate	Special tax rate	Eligibility (firm size)	Eligibility (other criteria)
Luxembourg	<ul style="list-style-type: none"> flat rate: 21% (22.47% incl. surcharge) 	<ul style="list-style-type: none"> flat rate: 20% (21.4% incl. surcharge) 	<ul style="list-style-type: none"> taxable income \leq € 15,000 	<ul style="list-style-type: none"> none
Netherlands	<ul style="list-style-type: none"> progressive schedule: <ul style="list-style-type: none"> -20% (€ 0 - € 200,000) -25% (income over € 200,000) 		<ul style="list-style-type: none"> none 	<ul style="list-style-type: none"> none
Portugal	<ul style="list-style-type: none"> flat rate: 23% progressive surcharge: <ul style="list-style-type: none"> -0% (€ 0 - € 1.5 million) -3% (€ 1.5 million - € 7.5 million) -5% (€ 7.5 million - € 35 million) -7% (income over € 35 million) 	<ul style="list-style-type: none"> progressive rate: <ul style="list-style-type: none"> -17% (€ 0 - € 15,000) -23% (income over € 15,000) 	<ul style="list-style-type: none"> no. of employees \leq 250; turnover \leq € 50 million; balance sh. tot \leq € 43 million none 	<ul style="list-style-type: none"> none none
Romania	<ul style="list-style-type: none"> flat rate: 16% 	<ul style="list-style-type: none"> flat rate: 3% on turnover (mandatory) 	<ul style="list-style-type: none"> turnover \leq € 65,000 	<ul style="list-style-type: none"> privately owned exclusion of certain sectors (e.g., banks, insurance, consultancy)
Spain	<ul style="list-style-type: none"> flat rate: 28% 	<ul style="list-style-type: none"> flat rate: 25% progressive rate: <ul style="list-style-type: none"> -25% (€ 0 - € 300,000) -28% (income over € 300,000) flat rate: 24% 	<ul style="list-style-type: none"> no. of employees \leq 25; turnover \leq € 5 million turnover \leq € 10 million turnover \leq € 10 million 	<ul style="list-style-type: none"> no. of employees must not be smaller than in 2009 none only in the Basque regions of Alava, Vizcaya and Guipúzcoa
United Kingdom	<ul style="list-style-type: none"> flat rate: 30% (for oil & gas companies) 	<ul style="list-style-type: none"> progressive rate: <ul style="list-style-type: none"> -19% (£ 0 - £ 300,000) -marginal relief (between £ 300,001 and £ 3 million) -30% (if income over £3 million) 	<ul style="list-style-type: none"> none 	<ul style="list-style-type: none"> only for oil and gas companies

3.1.2.2 Exemptions

Tax exemptions are another form of output-based incentive offered to SMEs in Europe. For owners of transparently taxed entities, they are a regular occurrence in the personal income tax (see Table 6), either as a part of the progressive schedule or in the form of so-called basic allowances.¹¹¹ Moreover, small businesses are at least partly exempt from local business taxes and other minor levies in seven countries of the EU in 2015 (see Table 8). The impact of these exemptions as well as their specific designs and targeted size classes vary significantly. A comparison of the regimes, however, reveals a pattern that confirms previous observations from the other incentive types: The exemptions either provide a rather modest relief for a broad spectrum of businesses or they provide more generous relief but only for the very smallest enterprises. Hungary, for example, exempts all businesses with less than € 10 million of turnover from the so-called innovation tax that only amounts to 0.3% of adjusted net income. Spanish firms, in contrast, may be exempt from the local business tax (IAE) of up to 15% but eligibility requires turnover to be below € 1 million.

Effectively, exemptions are a form of special tax rates as eligible income is taxed at a rate of 0%. Hence, the regimes show the same advantages and disadvantages¹¹² and can be expected to be motivated by a similar rationale as preferential tax rates. Most importantly, policy-makers probably aim at administrative relief by exempting the very smallest businesses from certain taxes. This is similar to the value-added tax where the collection costs exceed actual tax revenues if the business' turnover does not reach a certain minimum.¹¹³ Exemptions, however, also represent a substantial incentive to stay below eligibility thresholds, either by remaining small, by tax planning or by evasion, as taxes can be completely avoided (instead of “merely” incurring a reduced rate). Regimes creating notches in the tax schedule, i.e., jumps in the average tax rate such as the Spanish exemption from the local business tax, are especially prone to creating those barriers to growth.¹¹⁴

¹¹¹ As mentioned before, progressive schedules and basic allowances in the personal income tax are not primarily intended to serve as tax incentives for small businesses, though. They are rather driven by social considerations to not overburden low-income individuals. See Blum/Kalven (1952) pp. 417 ff.; Mirrlees (1971) pp. 175 ff.; Diamond Saez (2011) pp. 165 ff.

¹¹² See Zee/Stotsky/Ley (2002) p. 1504.

¹¹³ See Keen/Mintz (2004) pp. 562 ff.

¹¹⁴ See Kleven/Waseem (2013) pp. 672 ff.; Slemrod (2013) pp. 259 ff.

Table 8: Special tax exemptions for SMEs in the EU (2015)

Country	Description of exemption	Eligibility criteria
Belgium	<ul style="list-style-type: none"> exemption from tax on capital gains derived from shares of other companies (0.412%) 	<ul style="list-style-type: none"> no. of employees \leq 50; turnover \leq € 7.3 million; balance sh. tot \leq € 3.65 million
France	<ul style="list-style-type: none"> exemption from local business tax (CVAE) on value added (sales minus purchases) 	<ul style="list-style-type: none"> turnover \leq € 152,500
Germany	<ul style="list-style-type: none"> exemption of first € 24,500 of income from business tax 	<ul style="list-style-type: none"> only non-corporate businesses
Hungary	<ul style="list-style-type: none"> municipalities may exempt small businesses from local business tax (2% on sales minus attributable costs) exemption from innovation tax (0.3% of local business tax base) 	<ul style="list-style-type: none"> no fixed thresholds no. of employees \leq 50; turnover \leq € 10 million; balance sh. tot \leq € 10 million)
Luxembourg	<ul style="list-style-type: none"> exemption of first € 17,500 of income from local business tax (5.4%-9%) 	<ul style="list-style-type: none"> none
Portugal	<ul style="list-style-type: none"> 50% of taxable income in first year of activity / 25% in second year 	<ul style="list-style-type: none"> only companies that apply optional simplified regime for micro companies: CIT rates levied on <ul style="list-style-type: none"> – 4% of sales and services in hotel and restaurant sectors – 75% of income from specific professional services – 10% of remaining income from services – 95% of royalty income – 100% of other gains accrued eligible companies for regime: <ul style="list-style-type: none"> – turnover \leq € 200,000 – bal. sh. tot. \leq € 500,000 – adoption of micro company accounting regime – no mandatory audit – 80% of share capital owned by individuals or other eligible entities
Spain	<ul style="list-style-type: none"> exemption from local business tax (IAE) 	<ul style="list-style-type: none"> turnover \leq € 1 million

3.1.3 Tax Incentives for Shareholders of SMEs

For corporate entities, there are two levels of taxation: the firm level and the shareholder level. Tax incentives can thus also be provided for the shareholders of SMEs. Obviously, such incentives primarily aim at enhancing investments in the SME sector and at improving the supply of capital for the respective enterprises. The basic idea is to increase the after-tax rate of return on SME investments, thereby enhancing the relative attractiveness of such investments. As for firm-level incentives, this can be done with the help of input- as well as output-based incentives. Either deductions are directly granted upon investing in an SME (input-based) or the proceeds derived from SME investments, i.e., dividends or capital gains, are taxed favorably (output-based). With regard to the investors, incentives can target institutional investors such as investment funds or non-institutional investors. The latter may be individuals as well as enterprises holding participations in other firms.

Table 9 displays the shareholder-level incentives for SME investments that are offered for non-institutional investors in the European Union in 2015.¹¹⁵ There are five countries providing substantial reliefs. Under most regimes, dividends and capital gains are (partly) exempt from taxation if the underlying shareholding relates to a company that qualifies as an SME. Alternatively, investments in SMEs may be depreciable (France) or induce immediate allowances (Ireland, Italy). Belgium and Italy only consider investments in small enterprises whereas Austria, France and Ireland target medium-sized entities as well. Mostly, the regimes apply additional eligibility criteria relating to minimum holding periods (Belgium, France) or firm characteristics such as firm age (France, Italy) and the engagement in innovative activities (France, Italy). In Austria and Ireland target companies must be unquoted. Furthermore, some regimes restrict the size of the investment to maximum absolute amounts or to maximum equity shares in the respective companies.

¹¹⁵ With regard to investor-level incentives, it needs to be pointed out that a country without specific incentives for SME investments does not necessarily provide unfavorable tax treatment for these ventures. The dividends and capital gains may, for example, be exempt due to a participation exemption or due to a general exemption of capital gains for individual shareholders (e.g., in Croatia, Malta, Slovakia). Table 9, however, focuses on regulations specifically targeting SMEs and favoring them over investments in large enterprises in the respective country. Moreover, the table excludes provisions providing preferential treatment to capital gains upon retirement or death (e.g., in Belgium, Germany and Ireland) as well as any reliefs granted with regard to the inheritance tax (e.g., in Germany, Ireland and Spain). See OECD (2009a) p. 94. For a more detailed discussion of shareholder level taxes and an overview of currently applicable tax rates, see Section 4.2.3.

Table 9: Tax incentives for shareholders of SMEs in the EU (2015)

Country	Description of relief	Eligibility criteria
Austria	<ul style="list-style-type: none"> • full exemption of income from participations in SMEs (dividends, capital gains, interest payments) by so-called intermediary investors • exemption of dividend payments by intermediaries to individuals for shareholdings up to € 25,000 	<ul style="list-style-type: none"> • no. of employees ≤ 250; turnover ≤ € 50 million; balance sh. tot ≤ € 43 million • investor must be corporate entity and be financed by equity • SMEs must be non-listed and European
Belgium	<ul style="list-style-type: none"> • reduced PIT rate on dividends from SMEs if shares issued in 2013 or after are held for 3 years or longer (20% instead of 25% after 3 years and 15% after 4 years) • possibility to create liquidation reserve that is subject to 10% tax rate instead of 25% withholding tax at time of liquidation • exemption of corporate distributions made in spite of losses from fairness tax (5.15%) 	<ul style="list-style-type: none"> • no. of employees ≤ 50; turnover ≤ € 7.3 million; balance sh. tot ≤ € 5 million; profits ≤ € 322,500 • no. of employees ≤ 50; turnover ≤ € 7.3 million; balance sh. tot ≤ € 5 million; profits ≤ € 322,500 • no. of employees ≤ 50; turnover ≤ € 7.3 million; balance sh. tot ≤ € 5 million; profits ≤ € 322,500
France	<ul style="list-style-type: none"> • exemption from capital gains taxation (PIT) depending on holding period: <ul style="list-style-type: none"> – 1-4 years: 50% – 4-8 years: 65% – over 8 years: 85% • capital contributions to innovative SMEs can be depreciated over 5 years by individual shareholders • allowance (18%) for investments in SMEs can be deducted from personal income tax base • allowance for individual business owners on capital gains upon retirement (max. € 500,000) • allowance (50%) on investments in SMEs for wealth tax purposes 	<ul style="list-style-type: none"> • no. of employees ≤ 250; turnover ≤ € 50 million; balance sh. tot ≤ € 43 million • SME subject to CIT, less than 10 years old when shares acquired • no. of employees ≤ 250; turnover ≤ € 50 million; balance sh. tot ≤ € 43 million • SME not older than 8 years • 15% of expenses spent on R&D • 50% owned by individuals • no. of employees ≤ 250; turnover ≤ € 50 million; balance sh. tot ≤ € 43 million • maximum allowance: € 50,000 (small companies) or € 20,000 (medium-sized companies) • no. of employees ≤ 250; turnover ≤ € 50 million; balance sh. tot ≤ € 43 million • no. of employees ≤ 250; turnover ≤ € 50 million; balance sh. tot ≤ € 43 million • maximum allowance: € 45,000

Country	Description of relief	Eligibility criteria
Ireland	<ul style="list-style-type: none"> • allowance (30% + 11%) for investments in unquoted SMEs by individuals (max. € 150,000; excess can be carried forward) • extended relief of € 100,000 in each of the previous 6 tax years for people investing in newly-incorporated, unquoted companies who work full-time or as a director for the company and derived the bulk of their income from employment prior to the investment 	<ul style="list-style-type: none"> • no. of employees \leq 250; turnover \leq € 50 million; balance sh. tot \leq € 43 million • SME must not raise more than € 15 million of capital in total and € 5 million in any 12-month period • SME must be resident/incorporated in EEA • capital must serve the creation or expansion of qualifying activities (no land-dealing, financial services, film production, hotels, nursing homes) with increase or maintenance of employment • additional allowance of 11% requires additional employment criteria to be fulfilled • investor must not own more than 30% of shares unless the capital of the company does not exceed € 500,000 • no preferential rights to dividends, redemption or assets upon liquidation • extended relief requires government certificate as potentially creating new jobs; certificate subject to extremely detailed conditions
Italy	<ul style="list-style-type: none"> • allowance for companies investing in innovative SMEs (20%; max. € 1.8 million; excess can be carried forward) 	<ul style="list-style-type: none"> • SME with production \leq € 5 million, not older than 7 years and active in innovative sectors • equity share \leq € 2.5 million and held for at least 2 years

Evaluating the regimes, input-based measures, i.e., allowances upon investment, appear more appealing than exemptions of dividends and capital gains. The latter may in fact rather incentivize divestiture as relief is only granted upon the withdrawal of capital.¹¹⁶ Allowances, in contrast, provide additional liquidity for taxpayers upfront (given the existence of positive income to be offset) and possibly enable more capital to be invested. Moreover, allowances limit losses in tax revenue if they are accounted for in the deduction of acquisition costs upon the sale. On the other hand, lock-in effects may thereby be reinforced as the taxable gain upon disposal is magnified.¹¹⁷

¹¹⁶ See Auerbach (1992) pp. 263 ff.; Seida/Wempe (2000) pp. 33 ff.

¹¹⁷ See Stiglitz (1983) pp. 259 ff.; Auerbach/Burman/Siegel (2000) pp. 355 ff.; Chari/Golosov/Tsyvinski (2005) pp. 2 ff.; Ivkovic/Poterba/Weisbenner (2005) pp. 1605 ff.

Irrespective of the specific form of relief, the above provisions on shareholder-level reliefs are comparatively complex. Hence, they are likely to cause substantial additional compliance and administrative costs, which casts doubts on their general usefulness in the SME sector. Moreover, the requirement of minimum holding periods may induce lock-in effects, i.e., investors may not withdraw and reinvest their capital in order to ensure eligibility for favorable taxation. The relief of capital gains from SME investments in France, for example, increases in the holding period from 0% (less than one year) to 85% (over eight years). Belgium instead exempts distributions from loss-making SMEs from the fairness tax, which clearly incentivizes the withdrawal of capital from those enterprises which are most likely to feature insufficient liquidity due to losses. This seems detrimental to the provision of more capital for SMEs, the actual goal of shareholder-level incentives. The same is true for limitations on the amount of capital to be invested that apply for several regimes. Obviously, these restrictions cap the flow of capital that is actually intended to be fostered. The provisions may be necessary to avoid misuse and overly large losses in tax revenue, though.

Apart from specific design issues, the general effectiveness of shareholder-level incentives in attracting additional capital to the SME sector is questionable as well. The number of non-institutional investors (apart from owner-managers) who are willing and able to invest significant amounts in small, unquoted companies is deemed to be rather limited.¹¹⁸ Even fewer of them are likely to have superior know-how on the evaluation of SME investments than specialized institutional investors¹¹⁹ – and those who have the expertise, e.g., business angels, probably do not need to be incentivized by some sort of tax incentive.

¹¹⁸ See Barber/Odean (2008) pp. 785 ff.

¹¹⁹ See Puri/Zarutskie (1998) pp. 2247 ff.; Shapira/Venezia (2001) pp. 1575 ff.

Table 10: Tax incentives for venture capital investors in the EU (2015)

Country	Reliefs for venture capital (VC)	
	Description of relief	Eligibility criteria
Belgium	<ul style="list-style-type: none"> reduced tax base for investment companies designed for venture capital investments (PRICAF): notional basis that usually leads to negligible tax liability (composed of disallowed expenses, abnormal or benevolent advantages received and indemnities paid for “missing coupons” in case of stock lending); annual option to apply usual regime private PRICAFs exempt from tax on investment institutions dividends paid by PRICAF that relate to capital gains realized on shares and capital gains upon the liquidation or redemption of shares in PRIFACs are exempt from withholding taxes capital gains on shares in PRICAFs exempt from PIT for individuals 	<ul style="list-style-type: none"> PRICAF = closed ended investment fund in corporate form with a maximum lifetime of 12 years that invests directly in non-listed and expanding companies; investors must be “private” (individuals or companies) who invest at least € 50,000 for shares of 4% to 16%; PRICAF must be managed by management company that is fully taxable for CIT purposes
Denmark	<ul style="list-style-type: none"> venture funds are exempt from being classified as non-transparent entities in contrast to other fund vehicles 	<ul style="list-style-type: none"> venture fund only invests in securities of SMEs with <ul style="list-style-type: none"> – balance sheet total ≤ DKK 125 million (≈ € 16.8 million) – no. of employees ≤ 250 – gross profits ≤ DKK 250 million (≈ € 33.6 million)
France	<ul style="list-style-type: none"> venture capital companies (SCRs) and venture capital funds (FCPRs) are exempt from CIT with income from securities favorable treatment of capital gains from shareholdings in SCRs and FCPRs <ul style="list-style-type: none"> – exemption for individual shareholders – reduced tax rate of 15% (instead of progressive PIT rates of 0-45%) for corporate shareholders capital contributions to SCRs and FCPRs can be depreciated over 5 years by shareholders 	<ul style="list-style-type: none"> SCR = corporate entity (SA) with at least 50% of assets invested in shares, convertible bonds and similar securities of French or EU non-listed companies (no participations over 40%); maximum participation in SCR is 30% minimum holding period of 5 years individual shareholders must reinvest proceeds to be exempt

Country	Reliefs for venture capital (VC)	
	Description of relief	Eligibility criteria
France (cont.)	<ul style="list-style-type: none"> individual venture capital companies (SUIRs) are exempt from CIT and annual minimum tax for 10 years dividends by SUIRs exempt from PIT; social taxes (13.5%) apply capital gains from SUIRs subject to progressive exemption from PIT as 10-year exemption of SUIR expires (otherwise fully taxable) 	<ul style="list-style-type: none"> SUIR = simplified stock corporation with only one shareholder and at least 95% of assets being shares in commercial, industrial or hand-craft unlisted companies from EU/EEA that are subject to CIT; target companies not older than 5 years and owned by at least 50% by individuals; maximum participation in target companies as well as SUIR is 30% minimum holding period of 5 years for progressive exemption of capital gains
Greece	<ul style="list-style-type: none"> closed-end venture capital mutual funds (AKES) deemed transparent for domestic and non-domestic investors AKES' exempt from VAT on management fees; further exemption of establishment, management contract and payment of unit holders' participation from any kind of tax, fee, stamp duty or charge 	<ul style="list-style-type: none"> AKES = partnership exclusively investing in securities of unlisted Greek firms; minimum assets upon establishment = € 3 million and maximum lifetime is 15 years; minimum investment per shareholder is € 150,000
Hungary	<ul style="list-style-type: none"> VC funds exempt from CIT and local tax; taxation on the level of the shareholders (no matter if individual or corporate; no participation exemptions apply) 	<ul style="list-style-type: none"> VC fund = legal entity under supervision of Hungarian Financial Services Authority that issues public or private investment units and is managed by an investment fund manager
Italy	<ul style="list-style-type: none"> proceeds of investors of VC funds are fully exempt from income taxation (fund itself is also exempt from income taxes) 	<ul style="list-style-type: none"> VC fund must <ul style="list-style-type: none"> – be mainly controlled by individuals – be incorporated for not more than 36 months – invest at least 75% of capital in small, non-listed, Italian companies (turnover ≤ € 50 million) that are subject to taxation and mainly controlled by individual shareholders
Luxembourg	<ul style="list-style-type: none"> dividends, capital gains and interest income of venture capital companies (SICARs) exempt from CIT and municipal tax SICARs exempt from net worth tax 	<ul style="list-style-type: none"> SICAR = venture capital company with a minimum capital of € 1 million that is managed from Luxembourg; status requires pre-approval by financial services authority

Country	Reliefs for venture capital (VC)	
	Description of relief	Eligibility criteria
Luxembourg (cont.)	<ul style="list-style-type: none"> dividends paid by venture capital companies are not subject to withholding taxes capital gains of non-resident individual shareholders from venture capital companies are always tax exempt (otherwise capital gains from qualified shareholdings taxable if sold within 6 months after acquisition) allowance for VC investments by corporate income taxpayers (100% of investments; max. €5 million per investment or 30% of taxable income) 	<ul style="list-style-type: none"> SICAR = venture capital company with a minimum capital of € 1 million that is managed from Luxembourg; status requires pre-approval by financial services authority target enterprises must use funds to develop new technologies / fabrications; certificate for eligible investments required
Portugal	<ul style="list-style-type: none"> venture capital funds are exempt from CIT (most income derived by investment funds is exempt beginning 2015 whereas special tax treatment of venture capital companies has been revoked) dividends derived from venture capital funds are subject to a withholding tax of 10% (instead of 28%) if the taxpayer is not otherwise exempt; additional option to aggregate dividends with other income and exclude 50% of the proceeds capital gains derived from venture capital funds are subject to a withholding tax of 10% (instead of 28%) for individual shareholders and to the normal CIT rate for corporate shareholders if the taxpayer is not otherwise exempt 	<ul style="list-style-type: none"> disciplinary provisions on the constitution and activities performed (investment in companies with high growth potential and contribution to their development)
Spain	<ul style="list-style-type: none"> exemption of capital gains (99%) and dividends received (100%) for venture capital companies (VCC) and venture capital funds (VCF) exemption (100%) of dividends paid by VCCs and VCFs tax credit available for capital gains from transfer of interests in VCCs and VCFs (maximum = gain realized) 	<ul style="list-style-type: none"> eligible capital gains must stem from shareholdings in non-financial and non-real-estate, non-listed companies that are held between one and 15 years

Country	Reliefs for venture capital (VC)	
	Description of relief	Eligibility criteria
United Kingdom	<ul style="list-style-type: none"> • venture capital trusts (VCT) exempt from CIT on capital gains • for subscriptions in VCT of up to £ 200,000 individual investors are <ul style="list-style-type: none"> – exempt from PIT on dividends – exempt from capital gains taxation – eligible for tax allowance equal to subscription 	<ul style="list-style-type: none"> • venture capital trust (VCT) = company approved by HMRC that invests in and lends money to small, unquoted companies (70% must be qualifying investments) <ul style="list-style-type: none"> – gross assets ≤ £ 15 million (pre-investment) / £ 16 million (post-investment) – no. of employees ≤ 250 (500 for knowledge intensive companies) – annual investment by VCT companies ≤ £ 5 million – lifetime risk finance total ≤ £ 12 million (≤ £ 20 million for knowledge intensive companies) – exclusion of certain activities (e.g., low-risk activities, financing, shipping, farming) – less than 7 years old when first benefiting from state aid (10 years for knowledge intensive companies) • minimum holding periods <ul style="list-style-type: none"> – 3 years for exemption from capital gains tax – 5 years for tax allowance

Altogether, shareholder-level incentives for non-institutional investors appear as an inefficient way of enhancing the capital supply for SMEs. Presumably, the plus in investments is rather modest¹²⁰ while the costs due to the complexity of the provisions and the impairment of investment neutrality are considerable. As a consequence, several countries provide incentives for venture capital (VC) companies and funds instead of shareholder-level measures for individual investors. VC funds and companies specialize in collecting and investing capital in young, up-coming firms that bear great risks but also great potential. Naturally, these firms are in the early stages of development and part of the SME spectrum.¹²¹ In the European Union, ten countries provide tax reliefs specifically aiming at venture capital entities in 2015 (see Table 10).¹²² They either exempt income on the level of the VC fund (nine countries) or they exempt the taxpayers who derive income from the VC fund (seven countries). Some Member States even exempt income on both levels. Most incentives tie the relief to certain requirements with respect to the targeted firms of the VC fund (e.g., firm size, firm age, legal form, activity performed) as well as to maximum participation quotas and holding periods. Most of the exemptions are full exemptions.

Given the number of available regimes, VC incentives are more popular with policy-makers than other SME incentives on the shareholder level. In comparison with the reliefs granted to individuals, they provide several advantages. First of all, a broader group of potential investors can be addressed by VC incentives as the number of individuals who are able to appropriately evaluate the risks and the growth potential of small, unquoted companies is deemed to be substantially lower than the number of individuals who are willing to invest in a VC fund.¹²³ In addition, funds improve the level of risk diversification and may be better suited to attract foreign investors.¹²⁴ The administrative costs also decrease if the incentive is only granted to a limited number of investment funds instead of thousands of individual investors. Overall, VC incentives should thus be more effective and more efficient in enhancing the

¹²⁰ So far, existing empirical evidence suggests only a weak relationship between preferential shareholder taxation and the amount of investments in SMEs. See Poterba (1989) pp. 47 ff.; Gompers/Lerner (1998) pp. 156 ff.; Cowling/Bates/Jagger/Murray (2008) pp. 8 ff.

¹²¹ Obviously, not all SMEs are eligible for venture capital incentives and some of the targeted companies of VC funds and companies may not be SMEs. Nonetheless, the overlap of SMEs and enterprises targeted by venture capital should justify the classification as SME incentive, though.

¹²² Table 10 only lists those regimes favoring venture capital investments over comparable investment funds and companies. Even in the absence of incentives for venture capital, however, tax systems may be very favorable for such investments as investment funds and investment companies are generally exempt.

¹²³ See Puri/Zarutskie (1998) pp. 2247 ff.; Shapira/Venezia (2001) pp. 1575 ff.

¹²⁴ See Norton/Tenenbaum (1993) pp. 432 ff.; Ruhnka/Young (1991) pp. 120 ff.

supply of capital for SMEs than shareholder-level incentives targeting non-institutional investors.

3.1.4 *Administrative Reliefs*

Besides input and output-based incentives for SMEs and their owners, the Member States of the European Union also offer several administrative reliefs for small businesses (see Table 11). Administrative reliefs do not aim at reducing the amount of actual tax payments but seek a reduction of businesses' compliance costs, which make up a significant part of the overall tax burden.¹²⁵ This is especially true for small businesses due to the large portion of fixed-cost components not growing proportionally in firm size.¹²⁶ Being small therefore constitutes a structural competitive disadvantage that is sought to be reduced by simplified procedures in determining enterprises' tax liability and the collection of tax payments.¹²⁷

One of the most important administrative reliefs for small businesses is simplified accounting. A large share of the compliance burden of most businesses is made up by the costs of determining taxable income. Book-keeping and the preparation of tax accounts on an accrual basis often require substantial effort and external expertise in firms without an in-house tax department.¹²⁸ 23 of 28 EU countries therefore provide the smallest, mostly non-corporate businesses with the opportunity of simplified tax accounting, mostly on a cash basis.¹²⁹ The effect of cash-based accounts on actual tax payments should be limited as the regimes mostly include adjustments to pure cash accounting with regard to the depreciation of fixed assets and prepayments. Otherwise, simplified regimes would have similar effects as a very comprehensive scheme of immediate depreciation. Numerous countries, however, do not only provide the option for cash accounting but even more extensive accounting simplifications in income taxation. Under so-called presumptive regimes, income is not determined on the basis of comprehensive accounts of revenues and expenses. Instead, the tax assessment is based on only a few easy-to-track indicators. In general, four kinds of regimes can be distinguished:

¹²⁵ For a comprehensive review of the existing literature on the size and the composition of tax compliance costs, see Eichfelder (2010) pp. 50 ff.

¹²⁶ See Sandford/Godwin/Hardwick (1989) pp. 191 ff.; DeLuca/Stilmar/Guyton/Lee/O'Hare (2007) pp. 170 ff.; Eichfelder (2011) pp. 63 ff.

¹²⁷ See Section 3.1.4 for an overview of notable administrative reliefs for SMEs in the European Union and selected other countries.

¹²⁸ See Allers (1994) pp. 125 f.; OECD (2001b) p. 60.

¹²⁹ For a detailed description and analysis of simplified regimes of tax accounting in the EU, see Section 5.2.

- *Lump-sum deductions*: Taxpayers only record and report turnover while all expenses are estimated as a fixed percentage of turnover. (Percentages may vary according to the specific activities of the taxpayers.)
- *Turnover taxes*: Taxpayer only record and report turnover. No expenses are deductible but a decreased tax rate is imposed on (gross) income.
- *Taxation based on physical indicators*: No accounts (or only reduced accounts) are kept that the normal tax assessment is based on. Instead, the tax payable is derived from physical indicators such as the number of restaurant seats, the size of business facilities or the area of cultivable land.
- *Lump-sum payments*: No taxable income is determined. Instead, taxpayers are subject to a one-off payment that replaces the usual tax assessment.

Lump-sum deductions and turnover taxes are usually available for a wide range of micro businesses not exceeding a certain size (e.g., in Austria, Poland and the Slovak Republic) whereas methods based on physical indicators and lump-sum payments are restricted to specific sectors such as the agricultural sector or the hospitality sector. As taxpayers have to record and report fewer information, their compliance burden is likely to decrease significantly. The deviations from standard income, however, also increase when fewer accounting numbers enter the determination of the tax liability. Cost-efficient, highly profitable firms do thus not only benefit from presumptive regimes because of reduced compliance costs but also because of reduced tax payments. If the regimes are too beneficial, the danger of discouraging growth naturally increases as businesses may want to avoid becoming ineligible. A direct disadvantage stemming from simplified approaches can be neglected because the regimes are generally rebuttable, i.e., taxpayers can opt for a normal tax assessment if this is better for them.¹³⁰ Nonetheless, the usage of presumptive regimes generally appears questionable as every business owner should at least record her revenues and expenses and hence be able to determine her tax liability on the basis of cash accounts. The proper recording of all business transactions is also conducive for obtaining outside capital and improving the efficiency of an enterprise's operations.¹³¹ Presumptive regimes should thus be seen more as an administrative measure to cope with a large number of micro businesses rather than an appropriate relief for micro businesses.

¹³⁰ The turnover tax in Romania is the only mandatory regime where enterprises (corporate and non-corporate) are inevitable taxed on turnover if their revenues do not exceed € 100,000. In some other countries, however, enterprises need to choose the accounting regime for multiple years (e.g., in Austria, France and Portugal).

¹³¹ See Sandford/Godwin/Hardwick (1989) pp. 13 f.; Carter (2007) pp. 74 f.

Table 11: Administrative tax reliefs for SMEs in the EU (2015)

Country	Exemption from VAT (threshold in €)	Tax accounting			Tax returns and payments	
		Simplified accounting	Presumption	Lump-sum payments	Waiver of prepayments	Less frequent returns/payments
Austria	35.000	✓	✓			✓
Belgium	15.000	✓	✓		✓	
Bulgaria	25.565	✓	✓		✓	✓
Croatia	30.000	✓				✓
Cyprus	none					
Czech Republic	37.000	✓	✓			
Denmark	7.000					
Estonia	16.000	✓				
Finland	8.500	✓				
France	80.000 / 32.000*	✓	✓			✓
Germany	17.500	✓			✓	✓
Greece	10.000 / 5.000*	✓	✓			✓
Hungary	20.000	✓	✓	✓		✓
Ireland	37.500					✓
Italy	30.000	✓	✓		✓	✓
Latvia	50.000	✓	✓	✓		✓
Lithuania	45.000	✓	✓	✓	✓	✓
Luxembourg	25.000	✓			✓	✓
Malta	35.000 / 24.000*					
Netherlands	9.000					
Poland	35.000	✓	✓	✓		✓
Portugal	9.976	✓	✓			✓
Romania	65.000	✓	✓			
Slovak Republic	49.790	✓	✓			
Slovenia	50.000	✓	✓			
Spain	none	✓	✓			✓
Sweden	none	✓				✓
United Kingdom	100.000	✓				

* Different thresholds apply for the provision of services and goods.

Among the 23 countries implementing some form of simplified tax accounting, only a few do not restrict eligibility to micro companies.¹³² Moreover, the regimes are generally only open to non-corporate businesses, which adds another violation of legal form neutrality to the tax code.¹³³ This restriction, however, is economically justifiable as taxpayers can only be expected to incur significant savings in compliance costs from simplified regimes if they do not have to keep full accrual accounts for financial accounting. Corporate entities are usually subject to local commercial codes and financial accounting standards requiring accrual accounts. Their benefit from simplified tax accounting is thus likely to be limited.

The exemption from the value-added tax is another commonly used administrative relief for the very smallest businesses in Europe. Cyprus, Spain and Sweden are the only countries where no exemption is available. Exemption thresholds in the rest of Europe range from € 5,000 in Greece to about € 100,000 in the UK. Once again, efficiency considerations on the side of the tax administrations are likely to be the main reason for this exemption as the collection costs for the exempt businesses would be higher than the tax revenues generated.¹³⁴ With regard to neutrality and the provision of a level-playing field, a VAT exemption rather represents a distortion as some enterprises can offer their products and services to customers at lower prices just because they do not have to pay VAT. In fact, the exemption may enable inefficient, uncompetitive businesses to stay in the market and cannibalize other businesses paying VAT. Exemption thresholds should therefore be kept at an administratively acceptable minimum in order to prevent unnecessary market distortions.¹³⁵ Further commonly used administrative reliefs for small businesses with regard to income taxes and VAT include reduced regulations on the documentation of transfer prices, less frequent tax payments and the exemption from prepayments. The latter two reliefs apparently address potential liquidity constraints of small and especially new businesses.

Evidently, there is a multitude of possible facilitations in the process of taxation for small enterprises. These measures are generally well-suited to create a level playing field for SMEs as one of their structural competitive disadvantages is directly addressed. At the same

¹³² For a detailed discussion of eligibility for simplified tax accounting as well as potential effects of restrictions to eligibility, see Section 5.2.

¹³³ The only countries allowing simplified tax accounting in the corporate income tax are Hungary, Lithuania, Portugal and Romania.

¹³⁴ See Keen/Mintz (2004) pp. 559 ff.; Brashares/Knittel/Silverstein/Yuskavage (2014) pp. 290 ff.

¹³⁵ See Keen/Mintz (2004) pp. 559 ff.; OECD (2011) p. 49.

time, simplified procedures also reduce administrative costs on the side of tax agencies.¹³⁶ Too generous reliefs, however, entail the danger of holding back enterprises from growth as they want to remain eligible for the simplifications.¹³⁷ Such problems are especially likely to arise if incentives not only reduce compliance costs but also affect the actual tax liability. When the determination of income is based on presumptive methods, for example, or when enterprises are exempt from the value-added tax (VAT), the tax liability can be affected substantially. Similarly, significant interest advantages can emerge as a consequence of cash accounting or preferential modalities with regard to prepayments. Altogether, administrative reliefs may provide a useful policy tool to reduce the compliance burden, but they need to be designed and targeted carefully to prevent unintended, overly generous double-reliefs. Otherwise, the costs of newly induced distortions could outweigh the benefits from reduced compliance efforts.

¹³⁶ See OECD (2011) p. 49; Brashares/Knittel/Silverstein/Yuskavage (2014) pp. 301 f.

¹³⁷ Firms in Spain, for example, have been found to bunch at the turnover threshold beyond which they would become subject to the scrutiny of the large taxpayer unit of the tax administration. Similar effects have been found at thresholds exempting businesses from VAT registration. See Onji (2009) pp. 766 ff.; Almunia/Rodriguez-Lopez (2016) pp. 16 ff. A further discussion of firms remaining small to remain eligible for SME incentives is provided in Section 5.1.

3.2 *Impact of SME Tax Incentives on Effective Tax Levels in the EU*

3.2.1 *Introduction*

The qualitative overview of available regimes shows that SME tax incentives are common practice in the EU. The incentives, however, differ significantly in their design and in their scope of application. The actual impact of available incentives on the majority of micro, small and medium-sized enterprises may therefore be limited for many regimes. If, however, the effects on effective tax burdens were negligible, it would be hard to make a case for tax incentives given the additional compliance and administrative costs. This consideration is particularly relevant in the context of SMEs for whom compliance costs make up a larger share of the tax burden than for large companies.¹³⁸ The quantitative analysis also allows further conclusions about the proper targeting of SME tax incentives as it helps to unveil the relationship between the size of reliefs and firm characteristics such as profitability, capital intensity and capital structure. Lastly, the effective reduction of tax burdens also hints at potential distortions of investment and financing decisions introduced by size-dependent tax treatment (large firms versus SMEs but also micro versus small and medium-sized companies). In particular, businesses could be incentivized to not outgrow their current size class, which would, of course, be the opposite of the intended effect of SME tax incentives.

In the following quantitative analysis¹³⁹, effective tax burdens are derived using the European Tax Analyzer.¹⁴⁰ Section 3.2.2 first introduces the European Tax Analyzer and the model specifics underlying the calculation of the effective tax burdens. Next, Section 3.2.3 describes the quantification of the country-specific incentives before Section 3.2.4 compares the tax burdens for all size classes. Sections 3.2.5 and 3.2.6 follow up by providing comparisons of the different incentive types and several sensitivity checks, respectively.

¹³⁸ See Sandford/Godwin/Hardwick (1989) pp. 191 ff.; DeLuca/Stilmar/Guyton/Lee/O'Hare (2007) pp. 170 ff.; Eichfelder (2011) pp. 63 ff.

¹³⁹ The quantitative analysis is joint work with Rainer Bräutigam, Maria Theresia Evers and Christoph Spengel and will be published as a ZEW Discussion Paper. See Bergner/Bräutigam/Evers/Spengel (forthcoming).

¹⁴⁰ The European Tax Analyzer is a widely acknowledged tool for the calculation of effective tax burdens that has been applied in numerous studies for European Commission. See, for example, European Commission (2001); European Commission (2008); European Commission (2015b).

3.2.2 *European Tax Analyzer*

The European Tax Analyzer is a simulation program to calculate effective average tax burdens for model enterprises in different jurisdictions. For this study, four different model enterprises are considered: a large, a medium-sized, a small and a micro company. In order to sample the model firms, each company in the 28 Member States of the European Union as reported by the AMADEUS database by Bureau von Dijk (see Figure 1) is assigned to one of the four size classes.¹⁴¹ Building on this classification, averages of all relevant financial indicators are taken over the companies in each category. Finally, the averages define the respective model enterprises and their characteristics. Put differently, the model companies represent the average European companies in the four size classes.

The basic idea of the European Tax Analyzer is to simulate the development of the model companies twice: once in a world without taxes and once in a world with taxes. The difference in firm values between both scenarios ultimately represents the tax burden. The development of balance sheet positions, sales, costs and other financial indicators therefore needs to be simulated over a period of ten years in the next step. The estimates also include macroeconomic data such as interest rates (short- and long-term rates for debtor and creditor) and price increases (primary products, general inflation, wages, real estate and investment goods)¹⁴² as well as data on the structure and the costs for employees and R&D. For depreciable assets, it is generally assumed that they are disposed of at the end of their useful lives and replaced by an identical asset. The replacement costs are adjusted for inflation. The initial financial endowments consist of debt and equity. Dividends are distributed annually to shareholders whereas undistributed after-tax profits become retained earnings and can also serve as a further source for acquiring new assets or financing the corporation in general. Due to deriving average European model enterprises from the AMADEUS database, companies have identical pre-tax figures (balance sheet, profit- & loss-statement and liquidity) and are subject to equal macroeconomic parameters in all countries. As a consequence, differences at the end of the simulation period are exclusively induced by differences in tax codes.

¹⁴¹ A two-step approach is used to generate the model companies: First, each EU company in the AMADEUS database is classified as either micro, small, medium-sized or large according to the definition by the European Commission. In a second step, average financial indicators (i.e., balance sheet, profit and loss statement, etc.) are determined for each category and form the financial framework of the respective model enterprises.

¹⁴² Interest rates are determined by the average of the monthly short-term and long-term interest rates as provided by the European Central Bank (MFI interest rate statistics). Assumed price increases are determined by the average of monthly or quarterly price indices provided by Eurostat and the Statistical Office of Germany for 2012.

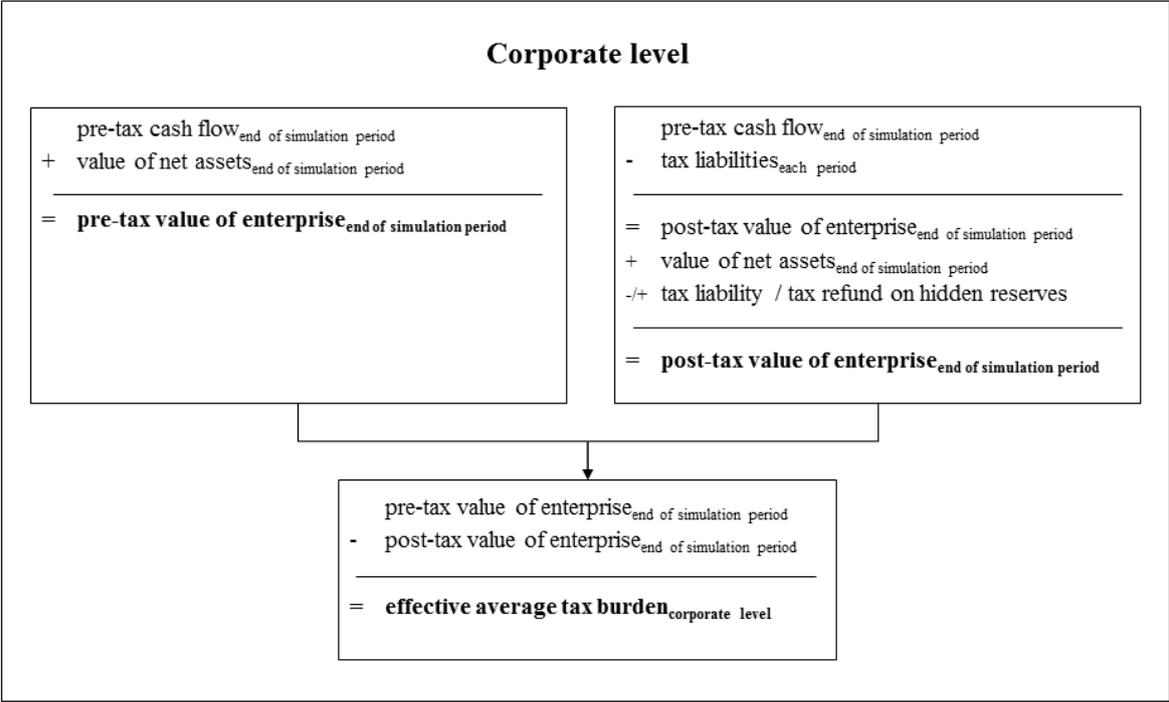
Figure 1: Model companies (European Tax Analyzer)

Balance Sheet ('000 €)	Micro	Small	Medium	Large
Total assets	1,074	4,442	15,857	171,949
Fixed assets	340	1,385	5,215	58,759
Intangible fixed assets	21	88	340	5,199
Tangible fixed assets	284	1,139	4,111	41,151
Other fixed assets	36	158	764	12,408
Current assets	734	3,057	10,642	113,190
Stock	175	816	2,978	27,362
Debtors	154	993	2,911	41,938
Other current assets	405	1,248	4,753	43,891
Equity & liabilities	1,074	4,442	15,857	171,949
Equity	509	2,268	7,035	73,194
Common stock	151	659	1,694	21,306
Other equity	358	1,609	5,341	51,888
Non-current liabilities	156	601	2,558	28,000
Long-term debt	127	416	1,796	19,937
Other non-current liabilities	28	185	762	8,063
Current liabilities	410	1,572	6,264	70,755
Loans	77	344	1,920	22,661
Creditors	246	963	3,265	32,385
Other current liabilities	87	265	1,079	15,709
Profit & Loss Statement ('000 €)				
Sales	659	4,764	19,404	209,689
Operating profit (loss)	72	381	1,348	14,278
Profit (loss) before tax	62	342	1,237	13,369
Profit (loss) after tax	48	264	957	10,384
Employment				
Employees	3	21	90	628
Costs of employees ('000 €)	84	634	2,703	21,939
Financial Ratios				
Return on equity	10.45%	13.15%	15.74%	16.53%
Profit to turnover ratio after tax	7.30%	5.30%	4.93%	4.95%
Equity ratio	47.35%	51.06%	44.37%	42.57%
Personnel intensity	14.18%	14.80%	14.97%	11.42%
Intensity of machinery	26.43%	25.64%	23.63%	23.93%
Stock intensity	16.29%	18.38%	18.78%	15.91%

Each model enterprise is a corporate entity. Hence, the relevant tax codes applied in the taxation of the model company throughout the calculation period are those applying to corporations in the EU Member States in 2015. Importantly, the multi-period approach combined with the modelling of an actual company allows the consideration of a multitude of tax rules that would not be possible otherwise. Above all, tax bases and tax codes' impact thereon

can be accounted for.¹⁴³ This is of particular importance for examining SME-specific tax incentives that often modify tax bases and restrict eligibility by thresholds referring to balance sheet totals, turnover or the number of employees.

Figure 2: Calculation of effective tax burden (European Tax Analyzer)



The actual tax burden on the corporate level is calculated by subtracting the post-tax value of the company at the end of the simulation period from the pre-tax value (see Figure 2). The former equals the sum of the pre-tax cash flows and the value of the net assets of the company at the end of the simulation period. The post-tax value of the enterprise is based on the pre-tax cash flow less the tax liabilities from each period. Moreover, the value of the net assets at the end of the simulation period reduced by potential tax liabilities on hidden reserves needs to be added to arrive at the post-tax value of the company. The effective tax burden is given as an absolute number.¹⁴⁴

¹⁴³ The following provisions relating to the tax base are considered: depreciation schemes (pool vs. individual depreciation schemes; depreciation periods), inventory valuation (LIFO, FIFO or weighted average cost method), capitalization of R&D costs, employee pension schemes (i.e., deductibility of pension costs, contributions to pension funds), thin capitalization rules, earnings stripping rules, notional interest deductions, provisions for bad debt and guarantee accruals, avoidance mechanisms for double taxation on foreign-source income (i.e., exemption method, tax credit, deduction of foreign taxes), non-deductible items and loss relief rules (carry-back, carry-forward). Additionally, non-profit taxes with special bases can be included (e.g., real estate tax, payroll tax).

¹⁴⁴ In the current version of the European Tax Analyzer, the approach of simulating the development of a model company over multiple periods does not allow the derivation of meaningful, annual effective tax rates that are

3.2.3 *Implementation of SME Tax Incentives*

Table 12 displays the currently available SME tax incentives that are included in the determination of effective tax burdens with the European Tax Analyzer. Calculations are made for all 28 Member States of the European Union. Due to the model assumptions and the characteristics of the model companies, not all regimes can be modelled. Since effective tax burdens are given as absolute numbers, the values calculated for the four model enterprises (micro, small medium-sized and large) cannot directly be compared with each other. Instead, the effective tax burden is calculated twice for each SME category: once according to the provisions applying to large enterprises and once allowing for SME tax incentives. The difference between both values represents the reduction induced by SME tax incentives. Comparing the relative reliefs for different size classes then enables a comparison of effect sizes.

Further SME incentives such as preferential loss offset rules and special provisions on carry forwards and refunds of excess reliefs provided by tax incentives usually do not show in the effective tax burdens due to the underlying assumptions about the model companies' economic development. Moreover, purely administrative reliefs cannot be captured and shareholder-level incentives are neglected.¹⁴⁵ SME incentives limited to overly specific assets, activities or regions (e.g., for energy rationalization, education and training expenses or investments in special economic zones) are not considered either because they do not apply to the majority of SMEs or their implementation would require a more detailed specification of the model company that is not feasible with the AMADEUS data at hand.

comparable to nominal tax rates and can be used for an ordinal ranking of investment alternatives. See Niemann/Bachmann/Knirsch (2003) pp. 125 ff.

¹⁴⁵ Shareholder taxation and the effect of incentives on this level of taxation are generally difficult to capture adequately because of the heterogeneity of shareholders. While investment funds and corporate investors are oftentimes exempt from the taxation of their proceeds, individuals are mostly not. However, even among them, taxation may vary significantly depending on the classification of proceeds as either capital income or business income. In addition, the vast majority of incentives are provided on the corporate level and previous analyses have found only small effects of incentives on the shareholder level. See European Commission (2015b) pp. 84 ff.

Table 12: Implementation of available SME tax incentives (European Tax Analyzer)

Country	Incentive	Implementation	
		Yes/no	Notes
Austria	-	-	-
Belgium	progressive CIT rate exemption from fairness tax exemption from capital gains tax increased notional interest deduction investment allowance (10.5%) investment allowance (4%) investment allowance for safety measures accelerated depreciation	yes no no yes no no no no	applies to each model SME does not apply to model companies (only corporate level considered) does not apply to model companies (no capital gains) applies to micro and small model companies does not apply to model companies (only for non-corporate entities) not applicable in combination with notional interest deduction not implemented due to limited application (only safety measures) not implemented due to model restrictions and immateriality
Bulgaria	-	-	-
Croatia	reduced CIT rate for new investments investment allowance for costs of education and training	no no	not implemented due to limited application (only new ventures and major business extensions; similar regime for all companies in place) not implemented due to model restrictions and immateriality
Cyprus	-	-	-
Czech Republic	-	-	-
Denmark	-	-	-
Estonia	-	-	-
Finland	-	-	-
France	reduced CIT rate exemption from surcharge on income tax liability (3.3%) exemption from surcharge on income tax liability (10.7%) progressive local business tax exemption from local business tax progressive minimum taxation tax credit for newly acquired assets (based on depreciation) tax credit for newly acquired assets (based on acquisition costs) tax credit for newly hired employees	yes yes yes yes no no yes no no	applies to micro and small model companies applies to micro and small model companies applies to each model SME effect not displayed because scheme is part of the general tax code does not apply to model companies (exceed eligibility threshold) does not apply to model companies (exceed eligibility threshold) applies to each model SME not implemented due to limited application (regional) not implemented due to model restrictions
Germany	accelerated depreciation investment allowance exemption from local business tax (€ 24,500)	yes no no	applies to micro model company not implemented due to model restrictions does not apply to model companies
Greece	-	-	-

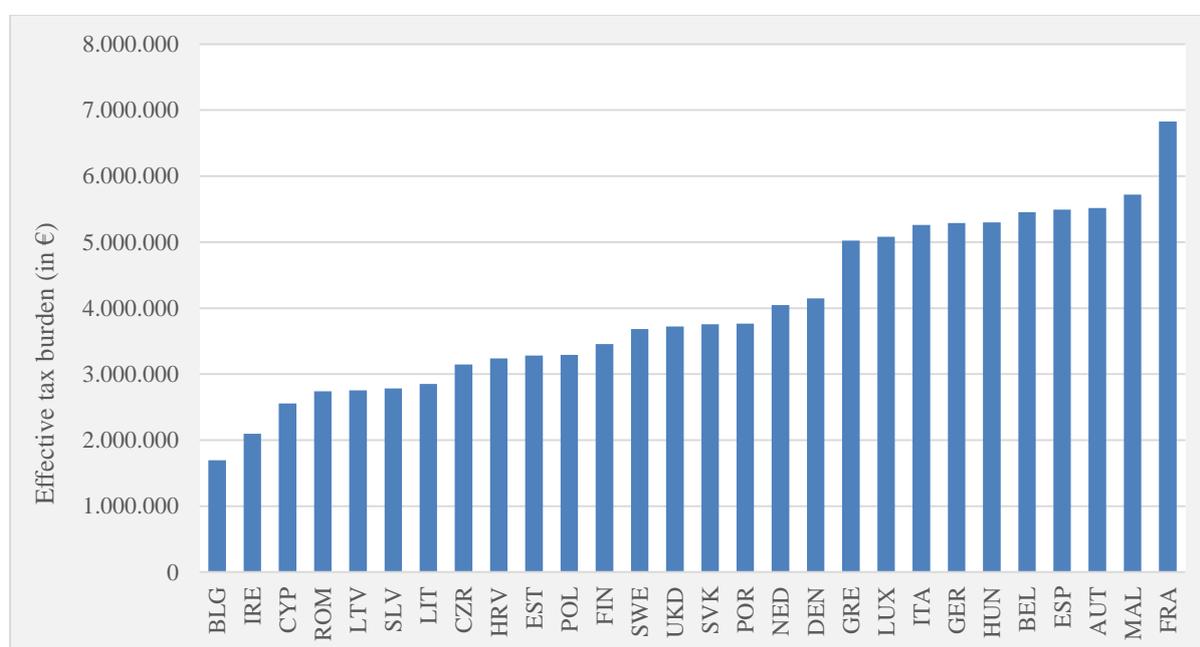
Country	Incentive	Implementation	
		Yes/no	Notes
Hungary	progressive CIT rate	yes	effect not displayed because scheme is part of the general tax code
	exemption from local business tax	yes	applies to micro and small model companies (municipalities determine eligibility)
	exemption from innovation tax	yes	applies to micro and small model companies
	tax credit for interest payments	yes	applies to each model SME
	investment allowances for new employees and disabled employees	no	not implemented due to model restrictions
	investment allowance for certain business assets	no	not implemented due to model restrictions
	accelerated depreciation	no	not implemented due to limited application (regional)
	alternative regimes (simplified entrepreneurial tax, small business tax, itemized tax on small businesses)	no	not implemented due to model restrictions
Ireland	reduced CIT rate for new companies	no	not implemented due to limited application (only new companies)
Italy	-	-	-
Latvia	progressive CIT rate	no	does not apply to model companies (exceed eligibility threshold)
	tax credit	no	not implemented due to limited application (regional)
Lithuania	reduced CIT rate	yes	applies to micro model company
	free depreciation	yes	applies to micro model company
	unrestricted loss carry forward	no	does not apply to model companies (no losses)
Luxembourg	reduced CIT rate	no	does not apply to model companies (exceed eligibility threshold)
	exemption from local business tax (€ 17,500)	yes	effect not displayed because scheme is part of the general tax code
Malta	tax credit (general)	yes	applies to micro and small model companies
	tax credit for R&D	no	not implemented due to limited application (only R&D)
	tax credit for new ventures and major business extensions	no	not implemented due to limited application (only new ventures and major business extensions and only certain activities)
Netherlands	progressive CIT rate	yes	effect not displayed because scheme is part of the general tax code
	investment allowance	yes	effect not displayed because scheme is part of the general tax code
	lump-sum deduction for R&D	no	does not apply to model companies (only for individual entrepreneurs)
Poland	immediate depreciation	yes	applies to micro model company
	tax credit for innovative technology	no	not implemented due to model restrictions
	investment allowance for new assets / new employees	no	not implemented due to limited application (regional)
Portugal	reduced CIT rate	yes	applies to each model SME
	progressive surcharge	yes	effect not displayed because scheme is part of the general tax code
	exemption from corporate income tax for new companies	no	does not apply to model companies (only if simplified regime applied)
	tax credit for R&D	no	not implemented due to limited application (only R&D)

Country	Incentive	Implementation	
		Yes/no	Notes
Portugal (ctd.)	tax credit for reinvested retained earnings	no	not implemented due to model restrictions
	notional interest deduction	yes	applies to all model SMEs but only to initial deposits and capital increases
Romania	turnover tax	no	does not apply to model companies (exceed eligibility threshold)
Slovakia	-	-	-
Slovenia	-	-	-
Spain	reduced CIT rates	yes	applies to each model SME (more generous for micro and small companies)
	reduced CIT rate (Basque regions)	no	not implemented due to limited application (regional)
	exemption from local business tax	yes	applies to micro model company
	tax credit for newly hired employees (€ 3,000 per employee)	yes	applies to micro and small model companies; only applies for new employees (model assumes employees to be eligible in first year)
	tax credit for newly hired employees (50% of outstanding unemployment payments)	no	not implemented due to model restrictions
	accelerated depreciation	yes	applies to micro and small model companies
Sweden	-	-	-
United Kingdom	progressive CIT rate	no	not implemented due to limited application (only oil and gas companies)
	investment allowance for R&D	no	not implemented due to limited application (only R&D)

3.2.4 Effective Tax Burdens by Size Class

Table 13 shows the effective tax burdens for micro, small, medium-sized and large companies as well as the reduction of the tax burden induced by SME tax incentives. First, the lack of significant reliefs for medium-sized entities in all but three countries (France, Hungary, and Portugal) is noticeable. The reduction of their tax burden does not exceed 2% anywhere. The average relief amounts to 0.1% (0.86% if only considering the countries providing incentives for medium-sized entities). Whatever arguments justify the use of SME tax incentives for policy-makers, they do not seem to apply to medium-sized enterprises, i.e., firms with 50 to 250 employees and an annual turnover between € 10 million and € 50 million.¹⁴⁶ As there are no significant reliefs for medium-sized companies, the ranking of the respective tax burdens is also a good estimate of the general levels of company taxation in the sample countries (see Figure 3). Clearly, substantial differences occur. France, for example, features a tax burden that is more than four times as high as the burden imposed on Bulgarian firms. In general, enterprises in Eastern European countries are subject to relatively low levels of taxation whereas the Western and the Southern European countries can mostly be found at the other end of the spectrum.

Figure 3: Effective tax burden of medium-sized companies (European Tax Analyzer)



¹⁴⁶ The definition of medium-sized enterprises given by the European Commission also demands a balance sheet total between € 10 million and € 43 million. The balance sheet total is rarely used as an eligibility criterion for SME tax incentives, though. See European Commission (2015c) pp. 10 f.

For small enterprises, the number of countries providing reliefs increases to eight (only taking into account those considered in the European Tax Analyzer). While half of them provide substantial reliefs (France, Hungary, Spain), incentives in the other half feature very modest effects (Belgium, Malta, Portugal). The average relief amounts to 3.50% of the tax liability as determined for the rules applying for large taxpayers (15.17% if only considering countries effectively providing incentives for small companies).

By far the most generous regime exists in Hungary where the tax burden is reduced by more than 60% compared to large enterprise rules. The reduction is mainly driven by exemptions from the local business tax and the so-called innovation tax which are only available for small and micro companies.¹⁴⁷ Municipalities, however, can decide against granting the exemption. Hence, businesses do not benefit everywhere in Hungary. In addition to the exemptions, small and micro companies may also be eligible for three alternative regimes that completely replace ordinary income taxation based on accrual accounts (the simplified entrepreneurial tax, the small business tax and the itemized tax on small businesses). These regimes may induce even larger reliefs. The case of Hungary exemplifies two major concerns with SME tax incentives. Firstly, if companies are not eligible for lucrative incentives as soon as they outgrow the small business category, generous reliefs provide a huge discouragement from growth or a huge encouragement of misreporting taxable income and business size. Total exemptions from certain taxes are especially prone to this problem. They create notches at which not only the marginal but also the average tax rate jumps. This creates stronger distortions of economic decision-making than so-called kinks where only the marginal tax treatment changes.¹⁴⁸ The availability of a multitude of regimes and incentives¹⁴⁹ is the second concern with Hungary. In the face of several options, entrepreneurs may experience difficulties in predicting the overall available relief and choosing the regime actually minimizing the tax burden. A substantial part of the tax savings may thus be offset by the additional costs of tax planning and tax compliance. As mentioned above, the imbalance of the relief and the costs of planning and complying becomes even more of a concern for less generous regimes, e.g., in Belgium.

¹⁴⁷ Both taxes are levied on the difference of sales and certain costs directly attributable to sales.

¹⁴⁸ See Slemrod (2013) pp. 259 ff., for a detailed differentiation of kinks and notches in the tax system. Section 5.1 also includes a detailed discussion of problems emanating from jumps in the tax system.

¹⁴⁹ Besides the alternative regimes, Hungary also offers several tax credits, allowances and depreciation schemes. See the country report in Annex 1.

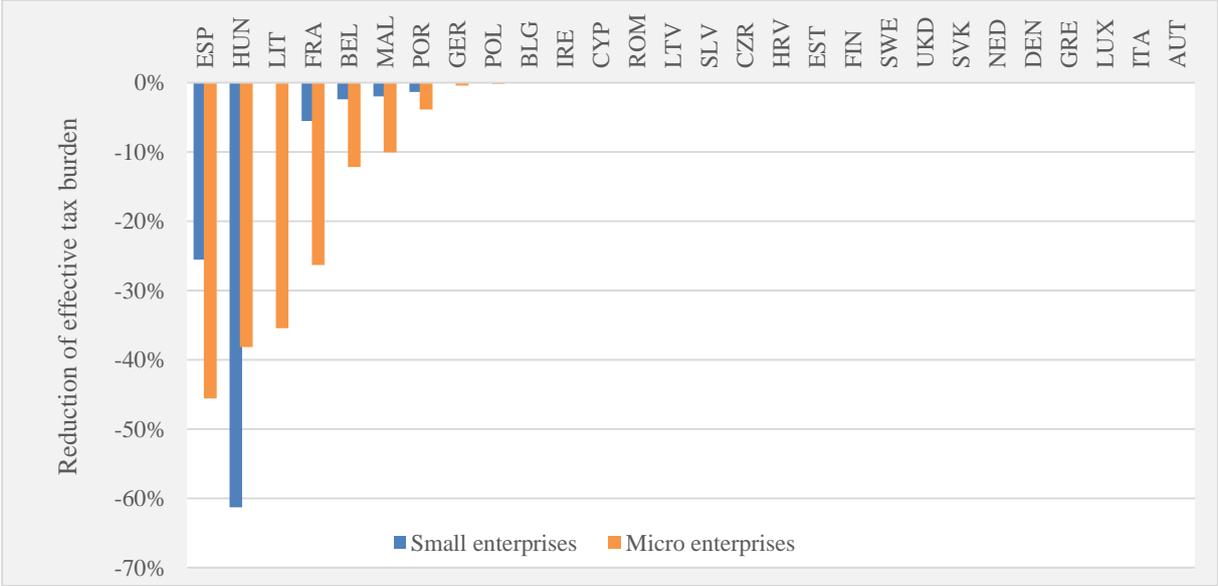
Table 13: Effective tax burden by size class in the EU in thsd. € (European Tax Analyzer)

Country	Large enterprise	Medium-sized enterprise			Small enterprise			Micro enterprise		
		No incentive	Incentives	Reduction	No incentive	Incentives	Reduction	No incentive	Incentives	Reduction
AUT	51,091.3	5,519.0	5,519.0	0.00%	1,506.9	1,506.9	0.00%	275.9	275.9	0.00%
BEL	54,151.9	5,451.7	5,451.7	0.00%	1,533.6	1,497.3	-2.37%	298.8	262.5	-12.15%
BLG	16,996.3	1,693.0	1,693.0	0.00%	485.4	485.4	0.00%	94.2	94.2	0.00%
HRV	32,459.7	3,240.3	3,240.3	0.00%	933.7	933.7	0.00%	178.6	178.6	0.00%
CYP	24,595.5	2,554.2	2,554.2	0.00%	697.2	697.2	0.00%	127.5	127.5	0.00%
CZR	31,522.9	3,145.3	3,145.3	0.00%	900.3	900.3	0.00%	174.1	174.1	0.00%
DEN	41,355.1	4,149.9	4,149.9	0.00%	1,185.9	1,185.9	0.00%	234.0	234.0	0.00%
EST	32,964.6	3,281.5	3,281.5	0.00%	936.3	936.3	0.00%	182.4	182.4	0.00%
FIN	34,494.8	3,455.9	3,455.9	0.00%	988.4	988.4	0.00%	192.9	192.9	0.00%
FRA	75,909.9	6,935.9	6,828.8	-1.54%	1,736.9	1,641.4	-5.50%	310.4	228.7	-26.31%
GER	53,577.4	5,291.7	5,291.7	0.00%	1,489.3	1,489.3	0.00%	288.7	287.6	-0.40%
GRE	49,627.8	5,023.7	5,023.7	0.00%	1,463.0	1,463.0	0.00%	288.8	288.8	0.00%
HUN	63,671.4	5,322.4	5,301.1	-0.40%	1,335.6	517.0	-61.29%	170.9	105.7	-38.17%
IRE	21,005.3	2,095.3	2,095.3	0.00%	600.2	600.2	0.00%	116.9	116.9	0.00%
ITA	52,459.4	5,261.3	5,261.3	0.00%	1,489.0	1,489.0	0.00%	289.5	289.5	0.00%
LTV	27,372.4	2,755.5	2,755.5	0.00%	786.6	786.6	0.00%	156.3	156.3	0.00%
LIT	28,234.5	2,851.2	2,851.2	0.00%	813.3	813.3	0.00%	163.3	105.4	-35.42%
LUX	50,949.7	5,081.8	5,081.8	0.00%	1,459.5	1,459.5	0.00%	275.1	275.1	0.00%
MAL	57,446.5	5,721.9	5,721.9	0.00%	1,637.6	1,605.7	-1.95%	316.2	284.5	-10.04%
NED	41,482.8	4,046.4	4,046.4	0.00%	1,088.0	1,088.0	0.00%	186.1	186.1	0.00%
POL	32,904.4	3,293.0	3,293.0	0.00%	941.8	941.8	0.00%	185.0	184.6	-0.20%
POR	43,562.7	3,796.6	3,767.1	-0.78%	1,071.6	1,057.4	-1.33%	208.2	200.1	-3.87%
ROM	27,385.8	2,742.0	2,742.0	0.00%	784.9	784.9	0.00%	153.9	153.9	0.00%
SVK	37,577.1	3,758.1	3,758.1	0.00%	1,075.1	1,075.1	0.00%	210.3	210.3	0.00%
SLV	27,954.0	2,782.2	2,782.2	0.00%	797.2	797.2	0.00%	154.2	154.2	0.00%
ESP	55,230.1	5,494.4	5,494.4	0.00%	1,572.0	1,170.5	-25.54%	305.0	166.0	-45.56%

Country	Large enterprise	Medium-sized enterprise			Small enterprise			Micro enterprise		
		No incentive	Incentives	Reduction	No incentive	Incentives	Reduction	No incentive	Incentives	Reduction
SWE	36,867.0	3,681.7	3,681.7	0.00%	1,054.1	1,054.1	0.00%	204.9	204.9	0.00%
UKD	36,942.8	3,720.9	3,720.9	0.00%	1,062.1	1,062.1	0.00%	212.5	212.5	0.00%
Mean	42,137.4	4,005.2	3,999.6	-0.10%	1,122.339	1,072.404	-3,50%	212.665	197.616	-6,15%

For micro companies, available SME tax incentives are even more numerous and more generous than for small entities. 10 out of 28 countries provide measures that are implemented in the calculations and the average relief per country increases from 3.50% to 6.15% of the effective tax burden. Except for Hungary, all countries with SME tax incentives in place offer more generous reliefs to micro than to small enterprises (see Figure 4). Apparently, policy-makers perceive the need for tax incentives to decrease in firm size across all three subcategories of the SME sector. Countries providing especially generous regimes for micro companies include Spain, Hungary, Lithuania, Belgium, France and Malta. Except for Lithuania, each of these countries features a comparatively high tax burden for large corporations. It seems, the higher the general tax burden, the more likely a country is to provide relief for small and micro businesses. Interestingly, this may evoke the problem of severely disadvantaging the enterprises which are just too big to be eligible for SME incentives but not big enough to lower the overall tax burden by engaging in international tax planning.

Figure 4: Effect of SME tax incentives (European Tax Analyzer)



3.2.5 Comparison of Incentive Types

Table 14 displays the reduction in tax burdens induced by three different types of SME tax incentives – incentives relating to the tax base (i.e., special depreciation schemes and investment allowances), tax credits and special tax rates. The comparison shows special tax rates to be the most common as well as the most generous type of tax incentive. The average relief provided by reduced tax rates amounts to 15.17% and 16.60% of the effective tax

burden for small and micro companies, respectively. This is three times as high as the average reduction induced by tax credits (for small entities even five times as high). The relief of measures relating to the tax base appears negligible at less than 1% on average. Altogether, only one input-based tax incentive reduces the tax burden of an average micro company by more than 10% (Malta) whereas special tax rates regularly induce double-digit reliefs.

There are several explanations for these findings. First of all, a number of input-based incentives cannot be implemented into the European Tax Analyzer because they relate to very specific circumstances that are not met by the model companies under consideration. While the omissions may amplify the gap between the effects of the different forms of relief, they are not the main driver as is evidenced by the lower average effect per incentive (4.11% vs. 13.06% for small companies and 5.55% vs. 20% for micro companies, respectively). Instead the basic design and the intentions behind the incentives appear to be crucial. By design, special depreciation schemes such as in Germany and Lithuania do not change the overall tax liability but only the timing of tax payments. The reduction of the tax burden can thus be traced back to a mere interest advantage emanating from deferred tax payments.¹⁵⁰ Tax allowances and tax credits theoretically allow for more generous reliefs as they reduce the overall sum of tax payments, either directly (tax credits) or indirectly (investment allowances). The reliefs, however, are modest as well. Partly, this is caused by the high profitability that is assumed for the model companies. For low-profit enterprises, the actual impact of input-based incentives may be larger than indicated by the European Tax Analyzer because the reduction of taxable income (of the tax liability if tax credits are considered) accounts for a larger share of the overall tax base (tax liability) for them. The modest relief, however, could also indicate other purposes than a mere reduction of the tax burden. The two allowances in Belgium and Portugal, for example, support equity financing. It seems their primary purpose is securing improved financing neutrality. The tax credits in Malta and Spain both relate to job creation and take employment or personnel costs as calculation bases. So the reduction of wage costs apparently is the aim of these regimes. Lastly, the abovementioned depreciation schemes may not substantially reduce the sum of tax payments but they do facilitate the financing of new

¹⁵⁰ The interest advantage naturally increases in the applicable interest rate. The calculations at hand assume an interest rate of 1.1%, which is evidence of the low-interest period financial markets have experienced in the past few years. In times of higher interest rates, special depreciation schemes may thus provide more generous reliefs.

investments, thereby addressing SMEs' problems in obtaining capital in early investment stages.¹⁵¹

Table 14: Effect of SME tax incentives by incentive type (European Tax Analyzer)

Country	Small enterprise				Micro enterprise			
	Tax base	Tax credit	Tax rate	Total	Tax base	Tax credit	Tax rate	Total
BEL	-1.85%	0.00%	-0.47%	-2.37%	-2.03%	0.00%	-10.10%	-12.15%
FRA	0.00%	-0.61%	-4.89%	-5.50%	0.00%	-0.51%	-25.81%	-26.31%
GER	0.00%	0.00%	0.00%	0.00%	-0.40%	0.00%	0.00%	-0.40%
HUN	0.00%	-1.48%	-59.70%	-61.29%	0.00%	0.00%	-38.17%	-38.17%
LIT	0.00%	0.00%	0.00%	0.00%	-1.95%	0.00%	-53.05%	-35.42%
LUX	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
MAL	0.00%	-1.95%	0.00%	-1.95%	0.00%	-10.04%	0.00%	-10.04%
POL	0.00%	0.00%	0.00%	0.00%	-0.20%	0.00%	0.00%	-0.20%
POR	-0.75%	0.00%	-0.58%	-1.33%	-0.88%	0.00%	-2.99%	-3.87%
ESP	-0.24%	-8.28%	-17.56%	-25.54%	-0.38%	-6.10%	-39.15%	-45.56%
Mean	-0,94%	-4,11%	-13,06%	-15,17%	-0,97%	-5,55%	-20,00%	-16,60%

Notes: Table 14 only covers countries providing SME tax incentives that can be implemented with the European Tax Analyzer. The average reduction for each type of incentive is calculated on a per-incentive basis, i.e., it only includes those countries providing the respective type of incentive.

Altogether, it seems that input-based tax incentives address very specific issues and that they focus on SMEs because SMEs are considered to be especially affected by the respective issues (e.g., financing constraints¹⁵²) or because they are perceived to be crucial in solving the issues (e.g., unemployment, insufficient R&D activity¹⁵³). Additionally, EU legislation may force Member States to limit tax incentives to small and medium-sized enterprises.¹⁵⁴ Targeting specific issues, however, oftentimes requires additional eligibility criteria so that a multitude of firms and investments are excluded (e.g., an increase in employment, a restriction to R&D-specific investments or a restriction to newly founded companies). This shows in comparatively small average reliefs in the calculations. Eligibility criteria for preferential SME tax rates, in contrast, usually only include firm size. They appear to be the instrument of choice if SMEs as a whole are intended to be relieved – whatever the motivation behind this kind of incentive may be.

¹⁵¹ For a scheme allowing immediate depreciation, the share of acquisition costs being contributed in the form of reduced tax payments in the acquisition year is (almost) equal to the statutory tax rate. In Spain, for example, immediate depreciation would thus reduce the capital requirements for the acquisition of a new machine by 25%.

¹⁵² See Section 4.1.4 for a comprehensive discussion of SMEs' financing constraints.

¹⁵³ See Section 4.1.2 for a comprehensive discussion of SMEs' role in job creation.

¹⁵⁴ The EC restricts the provision of direct and indirect state aid to selected enterprises to prevent the distortion of competition. SMEs are subject to less restrictive regulation. See European Commission (2009) pp. 9 ff.

The interplay of input-based incentives and special tax rates is another aspect worth examining. Four of the 10 countries with SME tax incentives provide several measures at the same time (only counting the incentives being implemented in the European Tax Analyzer). An especially interesting constellation occurs in Lithuania where the overall reduction of the tax burden for a micro company amounts to 35.42%. If the model company only took advantage of the special tax rate and deferred the option to immediately depreciate newly acquired fixed assets, the tax savings would be much higher (53.05% of the tax burden). The counterintuitive result occurs because immediate expensing of acquisition costs creates hidden reserves that are realized at the end of the sample period of 10 years. As a consequence, the income in the last period exceeds the eligibility threshold for the preferential tax rate and the model company incurs a higher tax burden than a similarly successful company with more consistent taxable earnings. This phenomenon, of course, is at least partly the result of the model assumptions, i.e., the final liquidation. However, it also shows that one incentive can impede the effectiveness of other incentives if the measures are not well-aligned. Moreover, the example highlights the increase in complexity for taxpayers if they are confronted with a multitude of tax incentives. Similar effects may occur when preferential tax rates and investment allowances are provided simultaneously as the value of an allowance increases in the marginal tax rate. Preferential tax rates could thus, for example, impede incentives to invest in R&D activities.

3.2.6 *Sensitivity Checks*

Besides the size of a company, other characteristics may impact the way companies are affected by SME tax incentives. The following sensitivity checks therefore examine the effects of changes in profitability, financial leverage, employment and the amount of machinery used by the model companies. The results not only show which kinds of enterprises benefit the most but also provide valuable insight into the mechanics of the incentives.

The results of the sensitivity check on profitability are displayed in Table 15. The relative size of the reliefs (the share of the overall tax burden that is avoided due to SME-specific provisions) is compared for the base case (micro company) as well as a high-profit and a low-profit scenario. For the high-profit case, the profitability of the model company is raised by 30% with everything else equal (assets, liabilities, number of employees). Accordingly, profitability drops by 30% in the low-profit scenario. The case of a firm with negative pre-tax profitability ratios is not considered. It is obvious, though, that loss-making firms

would only pay non-profit taxes and could not benefit from the implemented tax incentives unless refunds are granted on input-based measures (which is usually not the case).

First of all, the relative size of the reliefs mostly decreases slightly as profitability is raised. This pattern occurs because the size of most reliefs is not affected by a 30%-increase in profitability¹⁵⁵ while the overall tax liability grows in taxable income. Hence, the relief makes up a smaller share of the overall tax burden for more profitable businesses. Especially big differences between the three scenarios occur in France where the additional income induced by the increase in profitability is not subject to preferential tax rates whereas the income in the low-profit scenario is fully eligible. Consequently, the average corporate income tax rate is significantly lower for the low-profit than for the high-profit firm. With regard to input-based incentives, it needs to be highlighted that the absolute size of the relief only stays the same if marginal tax rates are strictly proportional in the considered interval of profitability. If rates are progressive – usually for non-corporate entities – the advantageousness of allowances and depreciation schemes increases in profitability. With progressive tax rates in place, such incentives would thus provide the smallest reliefs to the neediest businesses with the lowest profits (at least in absolute terms).

The example of France also discloses the redundancy of eligibility criteria explicitly relating to size. If companies beyond a certain size ought not to benefit from an incentive, it is usually enough to set the amount of eligible income, assets or expenses (depending on the type of incentive) sufficiently low. Even if large enterprises are eligible, the relief will then make up such a small share of their overall tax liability that it is negligible for them. They benefit much less than small entities while the incentive to remain small in order not to exceed a certain size threshold is eliminated. Additionally, the administrative effort for taxpayers as well as tax administrations is reduced as firm size does not need to be documented. Moreover, the amount of lost tax revenues should be limited given the small number of large enterprises (and even medium-sized ones).¹⁵⁶ A reverse trend, i.e., a regime being increasingly beneficial as profitability is raised, can be found in Lithuania. Lithuanian micro companies

¹⁵⁵ The increase in profitability is induced by an increase in sales. Hence, the calculation basis (acquisition cost of fixed assets, amount of equity, number of employees) of input-based incentives stays the same. As CIT rates are mostly proportional, this results in constant absolute reliefs. The relief provided by preferential tax rates also remains unchanged as long as the amount of preferentially treated income remains constant. The income of the micro model company mostly exceeds the eligible amount of income substantially so that the size of the relief is unaffected for these regimes as well.

¹⁵⁶ The percentage of large enterprises in the population of European businesses is 0.2%. For a detailed description of the distribution of firm sizes, see Section 4.1.1.

are subject to preferential tax rates which apply up to an income threshold so high that even in the high-profit scenario the model company's income is fully eligible. As the share of profit taxes relative to non-profit taxes increases in income, the relative size of the relief also grows.¹⁵⁷

Table 16 shows the results of the sensitivity check on the equity ratio. A direct impact of the amount of equity on the size of the relief can only be noticed in Belgium and Portugal. In these two countries, companies are allowed to deduct a notional interest on equity. Naturally, the interest deduction increases as more equity is obtained and the incentive regimes become more beneficial. Nevertheless, the average relief of all incentives considered decreases as the equity ratio is raised. This trend is not caused by changes in the actual size of the reliefs (measured in total €) but by changes in the income against which the reliefs are measured. As more equity is used, the amount of debt decreases so that interest payments and taxable income become smaller. The change in the equity ratio thus triggers a change in the profitability and results in the same effects already observed in the sensitivity check on profitability.¹⁵⁸ The trend of higher average reliefs for companies that are more levered therefore does not indicate the incentives to be discriminatory against equity financing but rather reflects the debt bias of the overall tax system.

Tables 17 and 18 display further sensitivity checks on the amounts of machinery and employment used by the model company. The schemes of accelerated depreciation in Germany and Lithuania expectedly yield larger reliefs if more machinery is used. Apart from that, the results reinforce the above findings: As machinery and employment are raised, the related expenses, i.e., depreciation and personnel costs, increase and lower the income of the enterprise. In most countries, the absolute size of the relief remains unaffected so that the share of the overall tax liability that is avoided due to SME tax incentives increases. The reverse effect occurs when the amounts of machinery and employment decrease. The mechanism is the same as for the sensitivity check for profitability.¹⁵⁹

¹⁵⁷ In Lithuania, the change in profitability also affects the taxation of the hidden reserves at the end of the sample period. As a consequence, opposing effects occur as profitability is changed. This also explains the increase of the overall relief in the high-profit as well as the low-profit scenario.

¹⁵⁸ The changes in Lithuania deviate from the rest of the sample, i.e., the relative size of the relief increases in the equity ratio. This is due to the high amount of income being eligible to the preferential CIT rates.

¹⁵⁹ Lithuania displays different patterns due to the abovementioned properties of the respective SME incentives.

Table 15: Effect of SME tax incentives by profitability (European Tax Analyzer)

	Profitability -30%					Base case				Profitability +30%				
	Tax base	Tax credit	Tax rate	Total	Δ base case (% points)	Tax base	Tax credit	Tax rate	Total	Tax base	Tax credit	Tax rate	Total	Δ base case (% points)
BEL	-2.17%	0.00%	-11.56%	-13.60%	1.45	-2.03%	0.00%	-10.10%	-12.15%	-1.95%	0.00%	-8.65%	-10.61%	-1.54
FRA	0.00%	-0.68%	-34.48%	-35.16%	8.85	0.00%	-0.51%	-25.81%	-26.31%	0.00%	-0.40%	-20.48%	-20.89%	-5.43
GER	-0.57%	0.00%	0.00%	-0.57%	0.18	-0.40%	0.00%	0.00%	-0.40%	-0.32%	0.00%	0.00%	-0.32%	-0.08
HUN	0.00%	0.00%	-42.33%	-42.33%	4.16	0.00%	0.00%	-38.17%	-38.17%	0.00%	-0.47%	-34.89%	-35.69%	-2.48
LIT	-3.04%	0.00%	-49.43%	-52.24%	16.81	-1.95%	0.00%	-53.05%	-35.42%	-1.65%	0.00%	-55.40%	-39.69%	4.27
MAL	0.00%	-13.49%	0.00%	-13.49%	3.45	0.00%	-10.04%	0.00%	-10.04%	0.00%	-8.02%	0.00%	-8.02%	-2.03
POL	-0.26%	0.00%	0.00%	-0.26%	0.06	-0.20%	0.00%	-0.20%	-0.20%	-0.16%	0.00%	0.00%	-0.16%	-0.04
POR	-1.17%	0.00%	-3.98%	-5.15%	1.28	-0.88%	0.00%	-2.99%	-3.87%	-0.70%	0.00%	-2.40%	-3.10%	-0.77
ESP	-0.44%	-8.13%	-38.96%	-47.50%	1.94	-0.38%	-6.10%	-39.15%	-45.56%	-0.30%	-4.88%	-39.27%	-44.40%	-1.17
Mean	-0,85%	-2,48%	-20,08%	-23,37%	4,24	-0,65%	-1,85%	-18,83%	-19,13%	-0,56%	-1,53%	-17,90%	-18,10%	-1,03

Table 16: Effect of SME tax incentives by equity ratio (European Tax Analyzer)

	Equity -30%					Base case				Equity +30%				
	Tax base	Tax credit	Tax rate	Total	Δ base case (% points)	Tax base	Tax credit	Tax rate	Total	Tax base	Tax credit	Tax rate	Total	Δ base case (% points)
BEL	-1.10%	0.00%	-10.23%	-11.38%	-0.77	-2.03%	0.00%	-10.10%	-12.15%	-2.88%	0.00%	-9.94%	-12.81%	0.66
FRA	0.00%	-0.54%	-27.63%	-28.17%	1.85	0.00%	-0.51%	-25.81%	-26.31%	0.00%	-0.47%	-24.21%	-24.69%	-1.62
GER	-0.42%	0.00%	0.00%	-0.42%	0.03	-0.40%	0.00%	0.00%	-0.40%	-0.37%	0.00%	0.00%	-0.37%	-0.02
HUN	0.00%	0.00%	-39.18%	-39.18%	1.01	0.00%	0.00%	-38.17%	-38.17%	0.00%	0.00%	-36.72%	-36.85%	-1.33
LIT	-2.05%	0.00%	-52.28%	-34.03%	-1.39	-1.95%	0.00%	-53.05%	-35.42%	-1.87%	0.00%	-53.73%	-36.67%	1.25
MAL	0.00%	-10.75%	0.00%	-10.75%	0.71	0.00%	-10.04%	0.00%	-10.04%	0.00%	-9.44%	0.00%	-9.44%	-0.60
POL	-0.21%	0.00%	0.00%	-0.21%	0.01	-0.20%	0.00%	-0.20%	-0.20%	-0.18%	0.00%	0.00%	-0.18%	-0.01
POR	-0.14%	0.00%	-3.20%	-3.34%	-0.53	-0.88%	0.00%	-2.99%	-3.87%	-1.52%	0.00%	-2.82%	-4.34%	0.46
ESP	-0.40%	-6.51%	-39.11%	-45.96%	0.39	-0.38%	-6.10%	-39.15%	-45.56%	-0.35%	-5.73%	-39.18%	-45.21%	-0.35
Mean	-0,46%	-2,47%	-19,11%	-19,13%	0,03	-0,54%	-2,31%	-19,08%	-19,10%	-0,61%	-2,17%	-18,92%	-19,01%	-0,09

Table 17: Effect of SME tax incentives by amount of machinery (European Tax Analyzer)

	Machinery -15%					Base case				Machinery +15%				
	Tax base	Tax credit	Tax rate	Total	Δ base case (% points)	Tax base	Tax credit	Tax rate	Total	Tax base	Tax credit	Tax rate	Total	Δ base case (% points)
BEL	-1.76%	0.00%	-9.56%	-11.35%	-0.80	-2.03%	0.00%	-10.10%	-12.15%	-2.34%	0.00%	-10.56%	-12.78%	0.63
FRA	0.00%	-0.46%	-23.33%	-23.79%	-2.52	0.00%	-0.51%	-25.81%	-26.31%	0.00%	-0.56%	-28.66%	-29.22%	2.91
GER	-0.31%	0.00%	0.00%	-0.31%	-0.09	-0.40%	0.00%	0.00%	-0.40%	-0.51%	0.00%	0.00%	-0.51%	0.11
HUN	0.00%	-1.05%	-36.27%	-37.61%	-0.57	0.00%	0.00%	-38.17%	-38.17%	0.00%	0.00%	-39.89%	-39.89%	1.71
LIT	-1.79%	0.00%	-55.82%	-57.36%	21.94	-1.95%	0.00%	-53.05%	-35.42%	-2.67%	0.00%	-49.94%	-30.05%	-5.38
MAL	0.00%	-9.03%	0.00%	-9.03%	-1.01	0.00%	-10.04%	0.00%	-10.04%	0.00%	-11.25%	0.00%	-11.25%	1.21
POL	-0.15%	0.00%	0.00%	-0.15%	-0.04	-0.20%	0.00%	-0.20%	-0.20%	-0.25%	0.00%	0.00%	-0.25%	0.05
POR	-0.55%	0.00%	-2.70%	-3.25%	-0.62	-0.88%	0.00%	-2.99%	-3.87%	-1.26%	0.00%	-3.34%	-4.60%	0.72
ESP	-0.29%	-5.49%	-39.30%	-45.04%	-0.52	-0.38%	-6.10%	-39.15%	-45.56%	-0.41%	-6.81%	-38.96%	-46.17%	0.60
Mean	-0,44%	-2,22%	-19,16%	-21,82%	2,73	-0,54%	-2,31%	-19,08%	-19,10%	-0,73%	-2,58%	-18,88%	-18,96%	-0,14

Table 18: Effect of SME tax incentives by employment intensity (European Tax Analyzer)

	Employment -30%					Base case				Employment +30%				
	Tax base	Tax credit	Tax rate	Total	Δ base case (% points)	Tax base	Tax credit	Tax rate	Total	Tax base	Tax credit	Tax rate	Total	Δ base case (% points)
BEL	-1.98%	0.00%	-9.56%	-11.56%	-0.59	-2.03%	0.00%	-10.10%	-12.15%	-2.09%	0.00%	-10.70%	-12.81%	0.66
FRA	0.00%	-0.46%	-22.74%	-23.21%	-3.11	0.00%	-0.51%	-25.81%	-26.31%	0.00%	-0.56%	-29.48%	-30.04%	3.72
GER	-0.38%	0.00%	0.00%	-0.38%	-0.02	-0.40%	0.00%	0.00%	-0.40%	-1.02%	0.00%	0.00%	-1.02%	0.62
HUN	0.00%	0.00%	-36.98%	-36.98%	-1.19	0.00%	0.00%	-38.17%	-38.17%	0.00%	0.00%	-39.36%	-39.36%	1.19
LIT	-1.87%	0.00%	-53.66%	-35.55%	0.12	-1.95%	0.00%	-53.05%	-35.42%	-2.04%	0.00%	-52.37%	-54.12%	18.69
MAL	0.00%	-9.50%	0.00%	-9.50%	-0.54	0.00%	-10.04%	0.00%	-10.04%	0.00%	-10.66%	0.00%	-10.66%	0.62
POL	-0.19%	0.00%	0.00%	-0.19%	-0.01	-0.20%	0.00%	-0.20%	-0.20%	-0.21%	0.00%	0.00%	-0.21%	0.01
POR	-0.83%	0.00%	-2.84%	-3.67%	-0.20	-0.88%	0.00%	-2.99%	-3.87%	-0.93%	0.00%	-3.17%	-4.10%	0.23
ESP	-0.36%	-5.77%	-39.19%	-45.26%	-0.30	-0.38%	-6.10%	-39.15%	-45.56%	-0.40%	-6.46%	-39.11%	-45.90%	0.34
Mean	-0,52%	-2,18%	-18,95%	-18,79%	-0,31	-0,54%	-2,31%	-19,08%	-19,10%	-0,66%	-2,45%	-19,14%	-22,20%	3,10

3.3 *Interim Conclusion*

The qualitative as well as the quantitative analysis in this chapter display the broad spectrum of SME tax incentives that are currently offered in the EU. Apparently, there is no consensus among policy-makers about the necessity and the design of SME tax reliefs. Disregarding administrative reliefs and provisions for venture capital funds, 10 of 28 EU Member states do not explicitly target any tax benefits at SMEs.¹⁶⁰ In contrast to that, some other countries such as Belgium, France and Spain have implemented a multitude of incentives for micro, small and medium-sized enterprises. The different approaches also show in the quantitative analysis as effective tax burdens of SMEs are reduced by up to 61%. Geographically, Scandinavian and Eastern European countries mostly refrain from supporting SMEs through the tax code while Southern and Western Europe seem more convinced of the usefulness of such measures. Germany, with two minor reliefs, is in the middle of the spectrum.

Preferential tax rates are the most common instrument to support SMEs. 11 of the 28 EU Member States feature CIT rate schedules favoring small businesses over large ones. Importantly, special tax rates usually apply to a wide range of micro and small enterprises as they are rarely connected to eligibility criteria not related to firm size. As a consequence, special tax rates and exemptions account for the lion's share of the overall tax relief for SMEs in the majority of countries. Output-based incentives, however, come along with significant problems as they only take effect when investments already generate profits. In the early investment stages, in contrast, they are mostly ineffective. Hence, output-based measures exclusively provide relief to profitable firms whereas loss-making enterprises do not benefit at all. Moreover, the currently available progressive CIT rates are detrimental to the neutrality of the tax system. They discriminate against risky investments and they constitute another distortion to the choice of legal form. As special tax rates are mostly tied to income thresholds, they are also prone to misuse by means of profit shifting and accounting policies.

Input-based incentives for SMEs are another commonly used form of tax relief in the European Union. Investment allowances as well as tax credits and accelerated depreciation schemes can each be found in about a quarter of the sample countries. Some of the countries such as Belgium, France and Spain even have several allowances and tax credits in place (see Figure 5). The input-based regimes often come along with extensive eligibility criteria. These

¹⁶⁰ The ten countries include Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, Slovakia, Slovenia and Sweden.

criteria restrict the benefits to certain kinds of companies and investments, e.g., only new companies, only R&D-related investments or only companies in certain regions. In other instances, the incentives are granted under certain conditions such as the creation of additional jobs or the reinvestment of preferentially treated income. As a consequence, the number of affected SMEs as well as the size of average effective reliefs is much lower for tax allowances, tax credits and depreciation schemes than for output-based measures.

The effective tax burdens as determined by the European Tax Analyzer do not take into account the improved liquidity that comes along with some tax incentives, though. Depreciation schemes, for example, only aim at deferring tax payments instead of reducing them. The displayed reliefs may therefore not be a proper indicator of the actual usefulness of the regimes. Similar arguments can be made for other input-based incentives providing support in the early investment stages. The aspect of supporting SMEs in obtaining enough funds for their planned investments is also highlighted by the provision of shareholder-level incentives. Apparently, a financing gap has been identified by policy-makers in several countries (e.g., Austria, Belgium, France) and is sought to be closed by tax incentives. For high-growth, high-risk start-ups, the problem seems to be even more pressing as evidenced by the numerous available venture capital benefits in the EU.

Overall, it appears that preferential tax rates are the primary instrument to support the small business sector as a whole whereas input-based and shareholder-level incentives are mostly designed to serve very specific purposes for which SMEs are considered key contributors. These purposes include the creation of jobs as well as the development of new products and technologies. The small average effect size found for input-based incentives, however, casts doubts on the effectiveness of currently available regimes to actually influence investment decisions, especially in view of the compliance and administrative effort related to the incentives. The widespread reliefs provided by output-based measures, on the other hand, most likely represent an intended compensation for size-related disadvantages of micro and small businesses, e.g., the disproportionate tax compliance burden.

The analysis of currently available SME incentives also shows that policy-makers differentiate between micro, small and medium-sized enterprises. The latter are eligible for not even a third of all SME incentives explicitly referring to size criteria whereas small entities are only excluded from a few regimes. Apparently, the need for tax incentives is perceived to be much stronger for micro and small businesses than for medium-sized enterprises.

The size criteria used in tax codes mostly correspond to the criteria from the SME definition of the European Commission (i.e., the number of employees, sales and total assets). The exact thresholds differ regularly, though. As an exception, eligibility for special tax rates mostly depends on income.

Interestingly, only few countries abstain from explicit size criteria and favor SMEs implicitly by establishing absolute maximum reliefs. In the Netherlands, for example, the investment allowance as well as the progressive tax rate schedule are open to all companies but the effect relative to the overall tax burden is likely to be negligible for medium-sized and large enterprises due to the small absolute amounts of eligible expenditures and income. Such implicit measures offer the advantage that exceeding the respective thresholds does not vacate the whole relief. Instead, it only changes the marginal treatment for excess investments or profits, which is more conducive to the equity and the neutrality of the tax system. In addition, the danger of businesses staying small in order to remain eligible for incentives is significantly lower. The usage of explicit size criteria becomes particularly puzzling when the thresholds refer to assets and employment. The creation of jobs obviously is a major goal of many incentives. In France, for example, a tax credit is granted on the wage taxes incurred for newly hired employees. At the same time, however, a company is in danger of completely forfeiting access to the tax credit if a certain number of employees is exceeded, i.e., if too many people are hired. The same discrepancy occurs if asset thresholds are implemented for regimes supporting investments in new machinery and production facilities. Explicit eligibility thresholds thus undermine the achievement of the actual goals of the incentives.

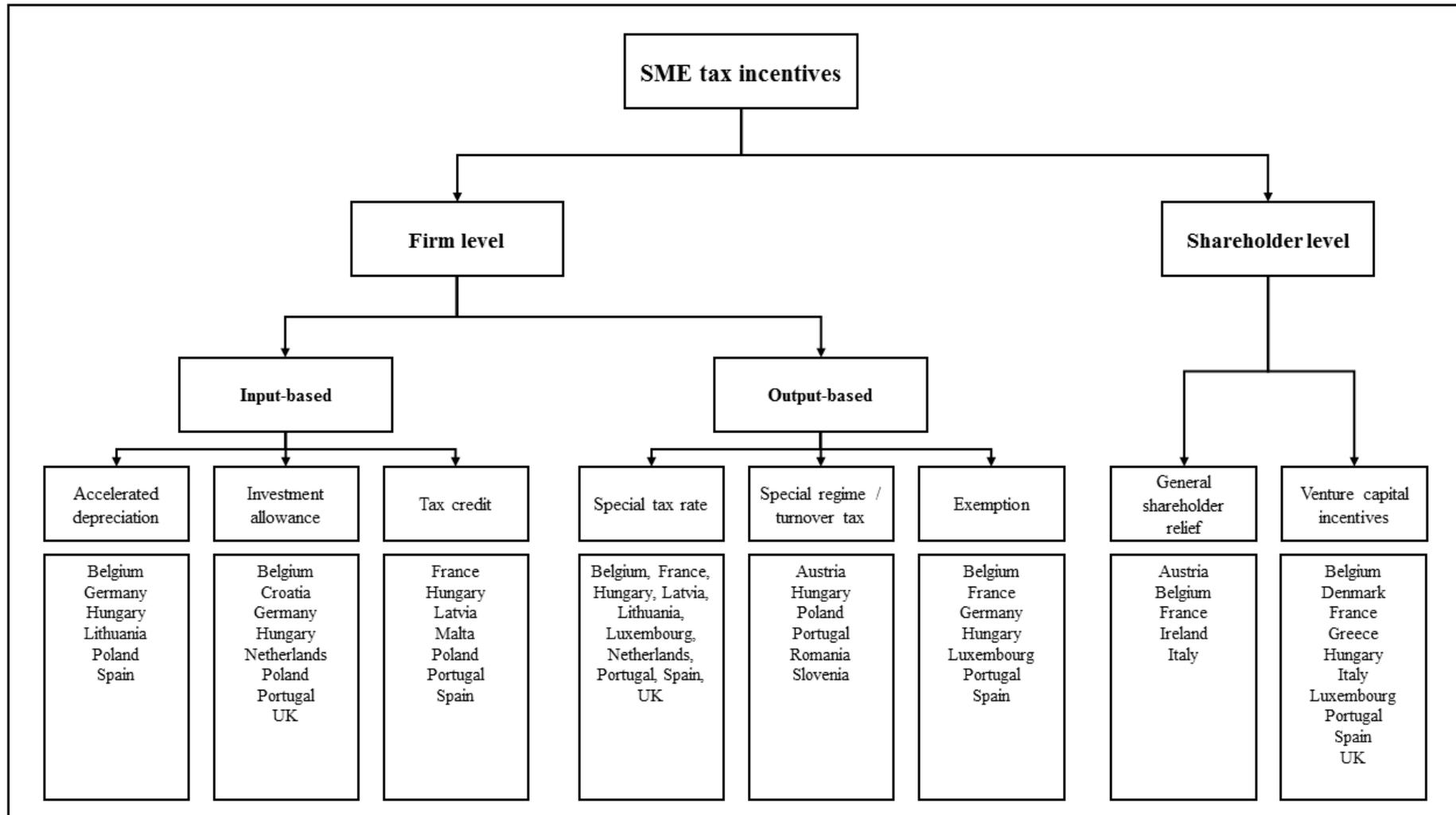
The current designs of many SME tax incentives in the EU also appear questionable with regard to the denial of refunds. If tax allowances and tax credits exceed the tax base (or the tax liability, respectively) only few countries grant a refund on the excess amount. More commonly, carry forwards or carry backs are granted. In several countries, however, even carry forwards are declined (or severely limited) so that low-profit and loss-making taxpayers forfeit the benefits. Given that low-profit firms in particular have problems to obtain enough capital for their investment projects, the respective incentives could exclude a large share of those taxpayers who are actually intended to be supported. The availability of multiple SME tax incentives in some countries is another noteworthy trend. As the quantitative analysis shows, the incentives impact on each other's effectiveness in lowering tax burdens. The effect of a diminished tax base obviously depends on the applicable tax rate and vice versa. An in-

vestment allowance for R&D investments, for example, could lose much of its appeal if the income is subject to a CIT rate of 15% instead of 33.33% as in France. The co-existence of multiple input and output-based regimes therefore adds a significant amount of complexity to the tax system. Given the prominent role of compliance costs for SMEs, legislators would probably be well-advised to provide the intended reliefs by means of a minimal number of regimes.

In accordance with this, countries in the EU seem to generally agree that the compliance burden connected to the tax assessment and tax collection process as experienced by large enterprises is excessive for the very smallest businesses. Hence, micro enterprises are subject to comprehensive simplifications in most countries. These include simplified accounting regimes, simplified collection procedures and even the exemption from certain levies such as the VAT and some local business taxes. The simplifications, of course, also serve the purpose of optimizing net tax revenues, i.e., not incurring overly high administrative costs for the collection of small amounts of taxes from thousands or millions of very small businesses.

All in all, the vast majority of SME tax incentives in the EU are not designed ideally. The common restriction of eligibility by explicit turnover, asset and employment thresholds is especially disputable as an implicit targeting of SMEs through absolute caps on available reliefs is the simpler and more neutral approach. Moreover, it is evident that each type of incentive features at least one caveat with regard to simplicity, transparency or neutrality. Overall, however, tax credits appear to be the instrument satisfying these criteria the best. The effectiveness and ultimately the efficiency of the regimes cannot be adequately assessed yet. This requires an in-depth understanding of the rationale underlying the respective SME incentives. The comparatively small reductions of effective tax burdens and the abundance of eligibility criteria and anti-avoidance provisions suggest a limited attractiveness of many regimes, though. The impact of most SME tax incentives could thus be limited as well.

Figure 5: Available SME tax incentives in the European Union (2015)



4. Policy Rationale for SME Tax Incentives

The qualitative analysis in Section 3 illustrates the common use of tax incentives for SMEs in general and for micro enterprises in particular in the European Union. The multitude of available incentives naturally raises the question of the rationale behind these regimes that come along with significant costs. Besides substantial losses in tax revenues, the partitioning of taxpayers compromises the neutrality and the equity of the tax system and enhanced complexity raises compliance as well as collection costs. Well-grounded SME tax incentives must thus provide substantial benefits in order to yield a net gain and increase the overall social welfare.¹⁶¹ And while it seems that supporting small businesses has become a generally accepted mantra among policy-makers and lobbyists,¹⁶² existing evidence on the benefits of SME tax incentives is mixed – at best. An adequate evaluation of the effectiveness and the efficiency of SME tax incentives thus requires a thorough examination of the arguments brought forward.

In this endeavor, Section 4.1 focusses on the main arguments not directly related to taxation. This includes the importance of the SME sector coming along with its mere size (4.1.1), the role of SMEs for job creation (4.1.2) and innovation (4.1.3) as well as their financing constraints (4.1.4) and their socioeconomic role (4.1.5). The second part of Section 4 complements these points and considers tax-related arguments in favor of SME tax incentives. Specifically, five disadvantages for SMEs emanating from the tax system are discussed: incomplete loss-offsets (4.2.1), the debt bias (4.2.2), the double taxation of corporate profits (4.2.3), potential tax planning opportunities for multinational enterprises (4.2.4) and the disproportionate compliance burden of small entities (4.2.5).

¹⁶¹ See Zee/Stotsky/Ley (2002) pp. 1501 f.; Klemm (2010) p. 323; Arginelli (2015) pp. 17 f.

¹⁶² See de Rugy (2005) p. 5.

4.1 *Non-Tax Arguments*

4.1.1 *Size of the SME Sector*

The mere size of the SME sector and its importance for the economy as a whole are frequently cited in public discussions as a reason for special support schemes. SMEs are commonly labeled the “backbone”¹⁶³ or the “engine”¹⁶⁴ of the economy. A look at the statistics confirms this role. SMEs account for 99.8% of all enterprises in the non-financial business sector in the European Union and for 67% of employment and 58% of the value added (see Figure 6¹⁶⁵). Among the three subcategories, micro enterprises make up the largest share as 92.7% of all businesses fall in this category. They alone provide almost 30% of all jobs in the EU.¹⁶⁶ In the United States, where 99.7% of all businesses have less than 500 employees in 2012 (i.e., possess the status of an SME according to U.S. standards), the numbers are similar. SMEs also provide 48.4% of total employment in the U.S and account for about 50% of the GDP.¹⁶⁷ Altogether, SMEs indeed make up a large part or even the majority of employment and economic output in most countries. Their importance for the economy and the job market is indisputable.

The question at hand, however, is not whether SMEs produce more output and employment than large businesses in absolute terms but rather if incremental investments in promoted SMEs create more output and jobs than comparable investments in large companies that would have been undertaken in the absence of SME tax incentives.¹⁶⁸ In a market economy, investors take their decisions with the intention of profit maximization. They invest in the undertakings promising the highest returns, which are usually the most efficient and productive ones. Hence, there should not be a need for reallocating capital – unless market failure occurs. In general, the open market should lead to an efficient allocation optimizing social welfare whereas government intervention mostly causes economically suboptimal results.¹⁶⁹ The mere size of the SME sector and its absolute contribution to the economy therefore do not

¹⁶³ See White House (2010): <https://www.whitehouse.gov/blog/2010/08/17/small-businesses-are-backbone-our-economy-and-cornerstones-our-communities> (retrieved on August 15, 2016); The Guardian (2014): <http://www.theguardian.com/small-business-network/2014/dec/06/small-businesses-backbone-communities-john-longworth> (retrieved on August 15, 2016).

¹⁶⁴ See Bundesministerium für Wirtschaft und Energie (2014): http://www.midasgruppe.de/uploads/media/German_Mittelstand_Motor_der_deutschen_Wirtschaft_-BMW.pdf (retrieved on October 25, 2016).

¹⁶⁵ Figure 6 is based on data provided by the European Commission. See European Commission (2015a) pp. 3 ff.

¹⁶⁶ See European Commission (2015a) p. 7.

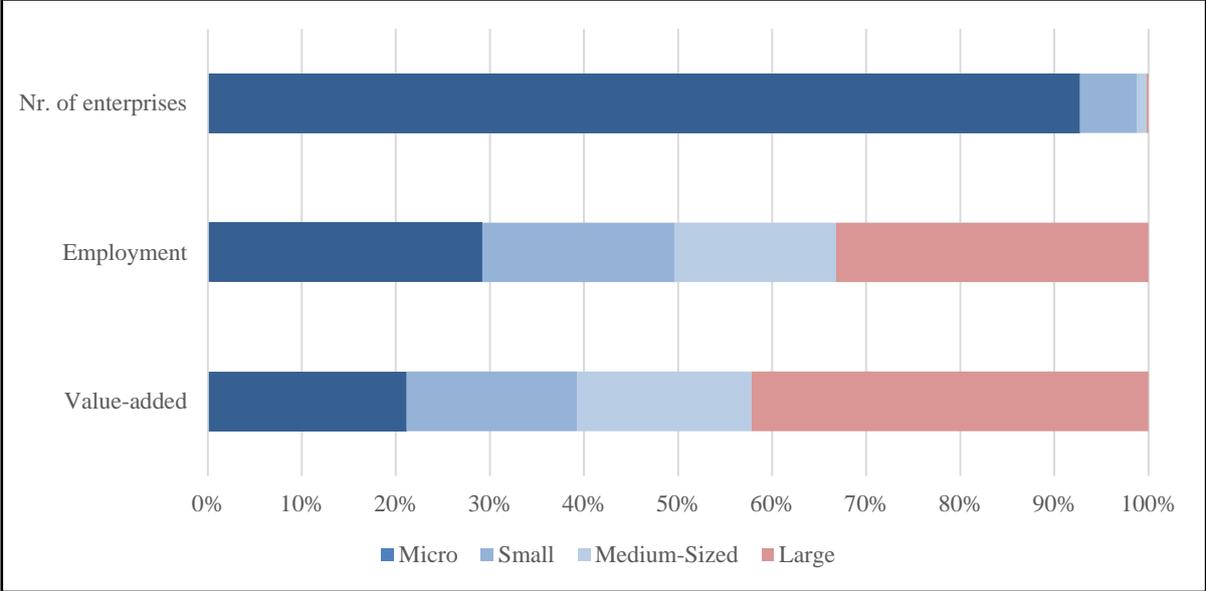
¹⁶⁷ See Caruso (2015) p. 7.

¹⁶⁸ See Guenther (2004) p. 22; OECD (2009a) pp. 84 ff.

¹⁶⁹ See Winston (2006) pp. 73 ff.

constitute valid arguments for the provision of special tax incentives based on firm size. However, the size of the SME sector may hint at the amount of political influence of small businesses and their lobbyists, thus providing an explanation rather than a justification for politicians’ proneness to implement and preserve such measures.¹⁷⁰

Figure 6: Contribution of SMEs to the economy in the EU (2014)



4.1.2 Job Creation

While the mere size of the SME sector does not suffice as a reason for special tax reliefs or other regulatory advantages, there may be other arguments. SMEs’ role for employment is probably the most prominent one in public discussions. Employment, of course, is a major policy goal in the European Union.¹⁷¹ It is desirable from a social point of view and it plays a key role for the national budget.¹⁷² More employment means less spending for social benefits and increased tax revenues and social security contributions. SME tax incentives would thus make sense, if they led to additional SME activity that comes along with addition-

¹⁷⁰ See Crawford/Freedman (2010) p. 1086; OECD (2010a) pp. 57 ff.; Qureshi (2013) pp. 19 ff. The recent German reform of the inheritance tax serves as a prominent example of successful lobbying activities in the interest of SMEs. During the reform process, the association of German family enterprises opposed the omission of numerous previously available reliefs upon the transfer of businesses. In the end they achieved considerable benefits for such transactions that had not been envisaged in the original draft. See SZ (2016): <http://www.sueddeutsche.de/wirtschaft/erbschaftsteuer-familienunternehmen-gewinnen-die-lobbyschlacht-1.3042505> (retrieved on November 28, 2016); taz (2016): <http://www.taz.de/Debatte-Erbschaftsteuer-fuer-Firmenerben/!5231172/> (retrieved on November 28, 2016).

¹⁷¹ See European Commission (2010a) pp. 3 ff.; European Commission (2010b) pp. 3 ff.

¹⁷² See European Commission (2014) pp. 11 ff.

al employment. Obviously, this rationale assumes SMEs to be more dynamic, to grow faster and to generate more jobs than large enterprises. A dollar invested in the SME sector must have more desirable employment implications than a dollar invested in large businesses, which should show in higher rates of job creation.¹⁷³

In public perception, the leading role of SMEs in job creation seems to be undoubted.¹⁷⁴ The academic discussion whether small businesses contribute more to job creation than large enterprises has been fierce, though. The debate was kicked-off by French economist Robert Gibrat. His rule of proportionate growth, also called Gibrat's Law, claims firm growth to be independent of absolute firm size.¹⁷⁵ Hence, SMEs should have the same expected growth rates as large entities and create new jobs at the same rates. In the 1950s and 60s, however, empirical evidence casted major doubts on Gibrat's Law and the assumption of proportionate growth became subject to some qualifications. Most notably, Hart and Prais (1956) contended that it only holds for surviving firms while Simon and Bonini (1958) observed Gibrat's Law to apply only if firms reach a so-called minimum efficient scale level of output. Businesses, in other words, need to reach a minimum size in order to generate sufficient economies of scale. Enterprises not reaching the minimum exit the market, which would explain the necessity for SMEs to grow faster.¹⁷⁶

Due to data limitations, empirical evidence was scarce until the 1980s when a couple of studies by Birch reignited the discussion on the dynamics of firm and employment growth.¹⁷⁷ Using data from the U.S. manufacturing industry, Birch (1981) finds establishments with less than 20 employees to be responsible for about two thirds of all new jobs in the U.S. in the period from 1969 to 1976. Establishments with more than 100 employees, in contrast, only provided 20% of newly created employment despite employing 65% of the total workforce.¹⁷⁸ For the period from 1981 to 1985, Birch (1987) reports similar results and barely finds any net job creation among large enterprises.¹⁷⁹ The findings strongly support the image of the SME sector to be the engine of growth and employment. In fact, the results indicate the small business sector (firms with less than 100 employees according to Birch's defi-

¹⁷³ See Bolnick (2004) pp. 4–10 f.

¹⁷⁴ See Davis/Haltiwanger/Schuh (1996a) p. 298; de Rugy (2005) p. 5.

¹⁷⁵ See Simon/Bonini (1958) pp. 608 f.

¹⁷⁶ See Hart/Prais (1956) pp. 161 ff.; Simon/Bonini (1958) pp. 608 ff.

¹⁷⁷ See Birch (1981) pp. 3 ff.; Birch (1987) pp. 7 ff.

¹⁷⁸ See Birch (1981) pp. 7 ff.

¹⁷⁹ See Birch (1987) pp. 12 ff.

dition) to create jobs at a net rate that is at least eight times as high as the large business rate.¹⁸⁰

Birch's findings shaped the academic view as well as the perception of politicians and the public that small businesses are the major source of employment and growth.¹⁸¹ His data and his analysis, however, were questioned by several authors. Numerous studies on the dynamics of firm growth and job creation followed his work. Interestingly, the results obtained are quite diverse. While some studies confirm Birch's findings, others report no or only a weak link between employment growth and absolute firm size.¹⁸² The diversity of results has also been accompanied by a discussion of several methodological questions that may – at least partly – have driven Birch's results. As his findings would indeed provide a strong argument in favor of an advantageous tax treatment for SMEs, it is essential to gain an understanding of the underlying methodological issues and resolve the question if the SME sector as a whole really create more jobs.

1) Data quality

In his seminal paper Birch uses longitudinal data on a large sample of U.S. establishments in the period from 1969 to 1976.¹⁸³ The data was collected by Dun and Bradstreet (D&B), a private-sector firm providing customers with commercial information such as credit records and ratings.¹⁸⁴ Being designed for other purposes than research on job creation, the dataset by D&B suffers several shortcomings. First of all, the correctness of the employment numbers is doubtful. The sum of all jobs registered in the D&B files, for example, exceeds the employment totals given by the U.S. Bureau of Labor Statistics by 8 million jobs in 1986.¹⁸⁵ Research has shown the data to be particularly error-prone for small and young businesses.¹⁸⁶ With regard to Birch's object of investigation, i.e., the role of the small business sector in job creation, this is worrisome. The recording of mergers and acquisitions (M&A) as well as

¹⁸⁰ See Birch (1981) pp. 7 ff.; Birch (1987) pp. 12 ff.

¹⁸¹ See Davis/Haltiwanger/Schuh (1996a) pp. 297 f.

¹⁸² See Table A1 in Annex 2 for an overview of empirical studies on the relation of firm size and job creation.

¹⁸³ The sample used by Birch contains about 80% of all recognized establishments during the sample period. See Birch (1981) p. 4.

¹⁸⁴ See Dun & Bradstreet: <http://www.dnb.com/company.html> (retrieved on April 1, 2016).

¹⁸⁵ See Davis/Haltiwanger/Schuh (1996a) p. 307.

¹⁸⁶ The D&B data does, for example, not include over 90% of newly founded businesses that appear in alternative sources. See Birley (1984) pp. 66 ff.

changes in the organizational form of businesses are further concerns with the D&B data. These events are often not properly accounted for and numbers on job creation and destruction could be biased in favor of the small business sector.¹⁸⁷

These shortcomings of Birch's data indeed cast some doubts on the reliability of his results and those of several other studies using similar data. A negative correlation of absolute firm size and employment growth, however, is also confirmed by numerous other studies, albeit at a smaller magnitude. Mostly, these studies employ datasets with better coverage (including micro enterprises) and a more accurate recording of firm births and changes in ownership structures.¹⁸⁸ The basic finding of small firms growing faster than large enterprises should therefore not solely be attributed to poor data quality. The magnitude of the difference in growth rates as reported by Birch should be considered with caution, though.

2) *Manufacturing vs. services*

Most studies finding comparatively high growth rates for the small business sector (including Birch's work) only cover manufacturing enterprises.¹⁸⁹ Manufacturing, however, may be subject to different growth dynamics than other sectors. Firstly, growth patterns could be impacted by a general decline of the secondary sector relative to the service sector in industrialized countries. Production activities have been increasingly outsourced by multinational enterprises to other countries with lower wage costs. As a consequence, the growth rates of large companies may be extraordinarily low when only considering the manufacturing sector.¹⁹⁰ Secondly, small manufacturers could be particularly hard-pressed to reach a minimum scale of opera-

¹⁸⁷ For many M&A transactions, firms and establishments are reported to be closed (and the jobs to be lost) by the S&B data although they were only acquired by new owners. The acquirer, on the other hand, would seem to create lots of jobs even though the increase in employment is attributable to the acquisition. As the target company should usually be smaller than the acquirer, this shortcoming in the data would lead to an underestimation of small businesses' growth rates if the firm level was considered. Birch, however, examines job creation at the establishment level. Hence, the data shows the establishment to close down and reopen. The direction of the bias thus depends on the post-acquisition development of the respective establishment and the exact recording of the transaction. See Davis/Haltiwanger/Schuh (1996a) p. 307; Haltiwanger/Jarmin/Miranda (2013) p. 348 f.

¹⁸⁸ See Dunne/Roberts/Samuelson (1989) pp. 671 ff.; Mata/Portugal (1994) pp. 227 ff.; Davidsson/Lindmark/Olofsson (1998) pp. 87 ff.; Barnes/Haskel (2002) pp. 1 ff.; Lotti/Santarelli/Vivarelli (2003) pp. 213 ff.; Voulgaris/Papadogonas/Agiomirgianakis (2005) pp. 289 ff.; Lotti (2007) pp. 347 ff.; Headd/Kirchhoff (2009) pp. 531 ff.

¹⁸⁹ See Davis/Haltiwanger/Schuh (1996a) pp. 308 f. Table A1 in Annex 2 also gives a comprehensive overview of the existing empirical literature on the subject.

¹⁹⁰ See Davis/Haltiwanger/Schuh (1996a) pp. 308 f.; Lotti (2007) pp. 349 f.

tions as economies of scale are more distinct in manufacturing than in the service sector.¹⁹¹

The issue of a manufacturing bias has been addressed by several studies. Audretsch et al. (2004) examine the Dutch hospitality sector while several other works use samples covering most or all sectors of the respective economies. The vast majority of them find a correlation of absolute firm size and growth rates.¹⁹² The studies, however, generally report the magnitude of the discrepancy between large and small businesses to be much smaller than estimated by Birch. Armington and Odle (1982) as well as Davidsson et al. (1998), for example, only observe a weak negative relation when considering all sectors.¹⁹³ Dunne and Hughes (1994) and Lotti (2007) confirm this and observe the differences to become even smaller (if not negligible) when businesses with less than 20 employees are excluded.¹⁹⁴ It is, in other words, primarily micro enterprises driving growth rates.

3) *Firm-level data vs. establishment-level data*

Most studies on growth dynamics and job creation aim at explaining the connection between firm size and firm growth. Still, Birch (1981) as well as numerous other works measure employment at the establishment or even the plant level.¹⁹⁵ Basing policy advice on results from establishment-level data is problematic, though. A small establishment can still be part of a large firm. Hence, small establishments growing faster than large establishments does not necessarily prove small firms to

¹⁹¹ In the European Union, the average size of businesses (measured in turnover) in the manufacturing sector substantially exceeds the average size in the service sector, which suggests firm size and economies of scale to play a bigger role in manufacturing. On the other hand, economies of scale may also drive results in the opposite direction if the advantage of being large does not even allow small businesses to compete and develop. See European Commission (2004) p. 12; Hurst/Pugsley (2015) pp. 1 ff.

¹⁹² See Kirchoff/Phillips (1988) pp. 261 ff.; Gallagher/Daly/Thomason (1991) pp. 269 ff.; Amirkhalkhali/Mukhopadhyay (1993) pp. 223 ff.; Dunne/Hughes (1994) pp. 115 ff.; Harhoff/Stahl/Woywode (1998) pp. 453 ff.; Heshmati (2001) pp. 213 ff.; Lotti (2007) pp. 347 ff.; Headd/Kirchoff (2009) pp. 531 ff.; Headd (2010) pp. 1 ff.; de Kok/Vroonhof/Verhoeven/Timmermans/Kwaak/Snijders/Westhof (2011) pp. 27 ff.; Nasar/Almasafir/Al-Mahrouq (2013) pp. 266 ff.; de Wit/de Kok (2014) pp. 283 ff. The only study using a sample of non-manufacturing firms and not observing a clear correlation between firm size and growth rates comes from Audretsch et al. (2004). Their results may be caused by the peculiarities of the hospitality sector that they focus on, though. See Audretsch/ Klomp/Santarelli/Thurik (2004) pp. 301 ff.

¹⁹³ See Armington/Odle (1982) pp. 14 ff.; Davidsson/Lindmark/Olofsson (1997) pp. 87 ff.

¹⁹⁴ See Dunne/Hughes (1994) pp. 115 ff.; Lotti (2007) pp. 347 ff.

¹⁹⁵ See Table A1 in Annex 2 for an overview of the data used by existing empirical studies on firm growth and job creation.

grow faster than large firms.¹⁹⁶ With regard to justifying SME tax incentives, this is problematic because tax incentives target firms, not establishments. There are even anti-misuse provisions coming along with several of the currently available regimes that ought to prevent small branches of large businesses from gaining admission.¹⁹⁷ Hence, the question to be posed for the currently available regimes is not whether small establishments (or plants) generate more jobs but whether small firms do so.¹⁹⁸

In addition, there is a methodological problem related to establishment-level data. Unless sufficient ownership information is provided, such data automatically drives the results towards a negative relation of firm size and job creation because any job creation by a small establishment being part of a large company is mistakenly attributed to the SME sector. As a consequence, SMEs' role in job creation is overestimated while the contribution of large businesses is undervalued. The extent of this bias is demonstrated by Armington and Odle (1982) who report the small business share of net job creation to be cut in half from 78% to 39% in Birch's data when correctly accounting for *firm* size (instead of establishment size).¹⁹⁹ There are, however, numerous other studies working with firm-level data which also find a robust negative correlation of firm size and firm growth.²⁰⁰ Even Odle and Armington (1982) observe small entities to create a disproportionately high number of jobs. The general finding of small businesses growing faster and creating more jobs on average than large entities should thus hold for the firm level as well. Again, the difference in job creation rates found by firm-level studies is smaller than reported by Birch (1981), though.

¹⁹⁶ See Armington/Odle (1982) pp. 14 f.; Davis/Haltiwanger/Schuh (1996a) pp. 300 f.; Haltiwanger/Jarmin/Miranda (2013) p. 349.

¹⁹⁷ A more detailed description of these rules, e.g., in France or Lithuania, is given in the country reports in Annex 1.

¹⁹⁸ The same applies to other elements of the regulatory environment, e.g., financial reporting duties. See Buschhüter/Striegel (2015) p. 24.

¹⁹⁹ See Armington/Odle (1982) pp. 15 f. On the other hand, establishment-level data may provide advantages with regard to the analysis of gross job creation, especially if M&A transactions are not accounted for properly. See Barnes/Haskel (2002) p. 5; Haltiwanger/Jarmin/Miranda (2013) p. 348.

²⁰⁰ See, for example, Evans (1987a) pp. 657 ff.; Evans (1987b) pp. 567 ff.; Gallagher/Daly/Thomason (1991) pp. 269 ff.; Broersma/Gautier (1997) pp. 211 ff.; Voulgaris/Papadogonas/Agiomirgianakis (2005) pp. 289 ff.

4) Netting out reality and regression to the mean

Besides the data used by Birch (1981), follow-up studies also criticized his methodological approach.²⁰¹ Birch's basic idea is to divide the population of firms into several size classes and to measure the number of jobs created and destroyed by each size category over the sample period. The net gain in employment ("net job creation") is his measure of interest. Based on this measures, he assesses the relative importance of small and large firms for job creation.²⁰²

Figure 7 illustrates how this focus on net changes in employment can give a wrong image of small and large businesses' role in job creation. In the example, small businesses only generate 20% of the new jobs but they account for 100% of net job creation. Merely considering the latter number would thus imply the impression of small businesses being the sole creators of new jobs. For the overall employment situation, however, it would be more harmful to lose the jobs provided by large enterprises. Hence, it is important to take net as well as gross numbers of job creation into account.²⁰³

Figure 7: Net and gross job creation (example)

	Firm 1	Firm 2	Firm 3	Small firms	Large firms	All firms
Employment _{t=1}	30	60	60	30	120	150
Employment _{t=2}	35	40	80	35	120	155
Net change	5	-20	+20	+5	0	+5
Small-firm share of net job creation:	$\frac{100\%}{(= 5 / 5)}$					
Small-firm share in gross job creation:	$\frac{20\%}{(= 5 / (20 + 5))}$					

The main methodological criticism of Birch, however, refers to the so-called regression fallacy (also: regression to the mean). This is a statistical pitfall that occurs when businesses are misclassified as either small or large due to transitory, not serially correlated shocks in employment.²⁰⁴ A (borderline) large company, for example, can experience a temporary one-year decline in employment. If the classification of firms as either small or large is solely based on this year, the company falls in the

²⁰¹ See Davis/Haltiwanger/Schuh (1996a) p. 299 ff.; Davis/Haltiwanger/Schuh (1996b) pp. 62 ff.

²⁰² See Birch (1981) pp. 7 ff.

²⁰³ See Davis/Haltiwanger/Schuh (1996b) p. 66; Neumark/Wall/Zhang (2011) p. 20.

²⁰⁴ See Haltiwanger/Jarmin/Miranda (2013) p. 349.

small businesses category despite generally being a large enterprise. When the company returns to the normal number of employees in the following year, the new jobs are reported to be created by a small firm. Similarly, jobs are recorded as being lost by a large enterprise when a small business experiences a positive transitory shock in the base year before returning to the normal level of employment in the following period. Ultimately, the regression fallacy thus always induces the growth rate of small enterprises to be overestimated while the large business rate is always depressed.²⁰⁵

Birch's analysis is especially prone to the regression fallacy because his size classification is solely based on the number of employees in the first sample year. Davis et al. (1996a, b) therefore propose the use of average size measurements that take multiple years into account.²⁰⁶ For a similar dataset, they replicate Birch's findings using the base-year method while not observing any systematic relation between firm size and employment growth for their alternative measures. They interpret this as a proof of Birch's findings to be driven by the regression fallacy.²⁰⁷ It needs to be pointed out, though, that their alternative measures also lead to misclassifications and introduce new bias. One bias is thus reduced at the cost of a new one. The question of which measure (or rather which bias) is more acceptable ultimately depends on the frequency of transitory shocks.

Either way, the cumulative body of follow-up studies indicates that the general finding of a negative correlation of absolute firm size and employment growth still holds when accounting for the regression bias. Several studies follow the approach of Davis et al. (1996a, b) and still confirm small firms to create more jobs on average. The correlation is less distinct for average size than it is for the base-year classification in these studies, though.²⁰⁸ Davidsson et al. (1998), Fariñas and Moreno (2000) and

²⁰⁵ See Davis/Haltiwanger/Schuh (1996a) p. 305 ff.

²⁰⁶ See Davis/Haltiwanger/Schuh (1996a) pp. 305 f.

²⁰⁷ Average size takes the average number of employees over all observation periods while current size only includes all observations up to the current year. See Davis/Haltiwanger/Schuh (1996a) pp. 305 f.; Davis/Haltiwanger/Schuh (1996b) pp. 66 ff.

²⁰⁸ See Broersma/Gautier (1997) pp. 211 ff.; Neumark/Wall/Zhang (2011) p. 16 ff.; Haltiwanger/Jarmin/Miranda (2013) pp. 355 ff.

Botazzi et al. (2001) also run explicit tests to determine the impact of the regression fallacy and only find it to play a minor role.²⁰⁹

5) *Firm size vs. firm age*

In his seminal paper, Birch (1981) claims small enterprises to create more jobs on average than their larger counterparts. As shown above, this finding has been scrutinized in many follow-up analyses. Comparatively little attention, however, has been paid to his second main finding that firm age is also negatively correlated with net job creation. In fact, 80% of all new jobs in his sample are accounted for by establishments not older than four years²¹⁰ and Birch clearly states that most small businesses are no creators of jobs. It is rather a small group of young, expanding start-ups that outgrow the small business category quickly.²¹¹

Confirmation comes from Armington and Odle (1982), Kirchoff and Phillips (1988) and Broersma and Gautier (1997) who find firm births to account for 30%, 50% and 100%, respectively, of net job creation in their samples.²¹² Voulgaris et al. (2005) and Lotti (2007) report only the group of firms that are younger than 5 and 10 years, respectively, to have positive rates of net job creation.²¹³ Further evidence comes from Dunne et al. (1988) and Headd and Kirchoff (2009) who do not observe businesses to grow much at all after the start-up phase.²¹⁴ Audretsch and Mahmood (1994) and Tang (2015) also believe most firms to settle in once they have reached the minimum efficient scale.²¹⁵ Regression-based studies featuring firm size and firm age as explanatory variables find both measures to negatively affect expected employment growth. Interestingly, Harhoff et al. (1998) observe the relation to be

²⁰⁹ See Davidsson/Lindmark/Olofsson (1998) pp. 87 ff.; Fariñas/Moreno (2000) pp. 249 ff.; Bottazzi/Dosi/Lippi/Pammolli/Riccaboni (2001) pp. 1161 ff.

²¹⁰ See Birch (1981) p. 8.

²¹¹ See Birch (1981) pp. 8 f.

²¹² See Armington/Odle (1982) pp. 15; Kirchoff/Phillips (1988) pp. 266 ff.; Broersma/Gautier (1997) pp. 216 ff.

²¹³ See Voulgaris/Papadogonas/Agiomirgianakis (2005) p. 295; Lotti (2007) p. 355.

²¹⁴ This empirical evidence is also in line with more recent theoretical models that seek to resolve the contradiction between empirically observed growth patterns and Gibrat's Law by interpreting growth as a learning process in which firms gradually find out about their deficiencies and as a consequence become increasingly efficient. As firms mature, the learning process slows down and so does firm growth. Naturally, firms starting out small have to learn more, i.e., grow faster, in order to be competitive. See Jovanovic (1982) pp. 649 ff.; Dunne/Roberts/Samuelson (1988) p. 509 ff.; Cabral (1995) pp. 161 ff.; Ericson/Pakes (1995) pp. 53 ff.; Head/Kirchoff (2009) pp. 540 f.

²¹⁵ See Audretsch/Mahmood (1994) pp. 247 ff.; Tang (2015) pp. 659 ff.

more pronounced for size while Voulgaris et al. (2005), Davidsson et al. (1998) and Haltiwanger et al. (2013) rather see the newness of businesses driving employment growth.²¹⁶

Summing up, empirical evidence generally confirms Birch's finding of absolute firm size being negatively correlated with rates of job creation and firm growth. The perception of solely small businesses creating new jobs is wrong, though. The prevalence of this perception is in part due to the results of Birch's studies that are driven by methodological deficiencies and problems relating to data quality. In addition, the ignorance of Birch's second main finding is key in explaining the misconception of small businesses' role in job creation: It is not small firms as a whole growing faster but only the so-called gazelles, the group of high-growth firms that are usually both small and young.²¹⁷ Recent evidence even suggests firm age to be the main determinant of expected growth whereas firm size has been found to have little predictive power when controlling for age. Exclusively using size criteria to target tax incentives therefore is an inefficient – if not ineffective – way of promoting growth and job creation.

As only a small group of young and upcoming enterprises accounts for the bulk of net job creation, some countries try to target SME tax incentives more specifically at these firms. France, Malta and Portugal, for example, offer special reliefs for newly founded SMEs and their shareholders.²¹⁸ Entry incentives, however, are also unlikely to have the intended effect on job creation because even among new firms the targeted high-growth firms only represent a minority. In fact, the entrepreneurship literature has identified two groups of entrepreneurs: On the one hand, there is the small group of progressive entrepreneurs with innovative ideas who enter the market to actively seize business opportunities, while on the other hand, there is the vast majority of defensive entrepreneurs who are mostly made up of passive followers, overoptimistic gamblers and escapees from unemployment. The latter group usually does not generate much growth and does not even aspire to do so.²¹⁹ Hence, the targeting of

²¹⁶ See Evans (1987a) pp. 657 ff.; Dunne/Roberts/Samuelson (1989) pp. 671 ff.; Fariñas/Moreno (2000) pp. 249 ff.; Harhoff/Stahl/Woywode (1998) pp. 453 ff.; Voulgaris/Papadogonas/Agiomirgianakis (2005) pp. 289 ff.; Haltiwanger/Jarmin/Miranda (2013) pp. 347 ff.

²¹⁷ See Birch (1981) pp. 8 f.; Birch/Medoff (1994) p. 162; Geroski (1995) pp. 422 f.; Acs/Mueller (2008) pp. 85 ff.; NESTA (2009) pp. 1 ff.

²¹⁸ See Section 3.1 and the country reports in Annex 1.

²¹⁹ See Evans/Leighton (1989) pp. 528 ff.; Toninelli/Vasta (2010) pp. 74 ff.; Hurst/Pugsley (2011) pp. 92 ff.

high-growth firms creating new jobs is inadequate even when using a combination of size and age-related eligibility criteria.

Furthermore, progressive entrepreneurs are unlikely to need tax incentives to start their businesses anyway. Intuitively, the marginal entrepreneur, i.e., the entrepreneur who starts a business only due to the availability of tax incentives, most likely is a defensive founder rather than a progressive entrepreneur. Somebody seeking to exploit an innovative idea or a novel business opportunity would probably engage in the venture irrespective of available reliefs and subsidies. The start-up decision of less competent and less ambitious entrepreneurs, in contrast, is more likely to be impacted by tax reliefs.²²⁰ Hence, start-up incentives tend to encourage the “wrong” entrepreneurs to start a business while the “right” ones receive tax benefits although they would have invested anyway. And even if some of the “right” taxpayers were lured into self-employment, there is no apparent reason to explicitly restrict start-up benefits to small and micro businesses.²²¹

Tying eligibility for SME tax incentives to increased employment (or at least to the retention of existing jobs) is another approach to target high-growth businesses more accurately.²²² Obviously, such incentives could induce firms to employ people they would not have hired in the absence of the relief. It is questionable, though, if job creation per se is an appropriate policy goal. A growing economy in which the allocation of resources is not impeded by market failure usually generates enough jobs on its own.²²³ Hence, policy-makers should rather focus on the provision of a neutral and investment-friendly business environment that keeps the obstacles to firm growth to a minimum.²²⁴ SME tax incentives, however, achieve the opposite. They discourage growth if eligibility is restricted by fixed turnover, asset or employment thresholds and – in the case of incentives tied to employment numbers – they distort the choice of input factors (capital vs. labor), which may hamper the overall competitiveness of a country’s economy.²²⁵ And even if the above arguments are neglected be-

²²⁰ See Johnson (2004) pp. 442 ff.; Shane (2009) pp. 145 ff.

²²¹ In fact, the probability of survival increases in the size of a start-up. Start-up incentives exclusively available for small and micro businesses may thus tend to benefit those start-ups that cannot survive on a level playing field. See Santarelli/Vivarelli (2002) pp. 43 ff.

²²² Increased employment as an additional eligibility criterion or as a calculation basis for SME tax incentives can currently be found in France, Hungary, Poland and Spain. See Section 3.1 and the country reports in Annex 1.

²²³ See de Rugy (2005) p. 18; Gravelle/Lowry (2012) pp. 14 f.

²²⁴ See Diamond/Mirrlees (1971a) pp. 8 ff.; Diamond/Mirrlees (1971b) pp. 261 ff.; Maula/Murray/Jääskeläinen (2007) pp. 58 ff.

²²⁵ See de Rugy (2005) p. 15.

cause employment is fostered for social rather than for economic reasons, the restriction of tax incentives to small enterprises again does not make sense unless jobs in large enterprises are considered to be inferior.²²⁶

Altogether, job creation does not constitute a valid argument for SME tax incentives. If additional employment is sought, the problem should be addressed directly, e.g., through reduced labor costs. Size, however, is not an accurate indicator of a firm's propensity to hire new employees. SME tax incentives are therefore neither efficient nor effective in generating new jobs. They benefit many businesses that are not intended to benefit and introduce more complexity and new distortions to the tax system, thereby impeding rather than fostering economic growth. The design of many of the currently available regimes, i.e., reliefs in the form of output-based incentives for which eligibility is explicitly restricted by absolute thresholds on turnover, assets and employment, even reinforces these problems.

4.1.3 *Innovativeness*

The innovativeness of the small business sector is another argument regularly brought up to support SME tax incentives. Evidently, innovation is a major driver of economic growth. The introduction of new products and technologies is key to raising general productivity.²²⁷ It promotes market competition, fosters the development of new markets and triggers the destruction of existing ones.²²⁸ SME tax incentives could thus be warranted if they spark additional SME activity that results in additional innovations and the exploitation of innovations in the form of successful and sustainable businesses to the benefit of the economy as a whole.

Similarly to R&D incentives, the innovation-based rationale for SME reliefs builds on the occurrence of market failure in the form of spillover effects. Such spillovers arise because the originator of an innovation often cannot exclude others from the benefits of the innovation, e.g., due to product imitation or the transfer of personnel.²²⁹ As a consequence, the

²²⁶ Empirical evidence rather suggests the opposite, though. Jobs in large enterprises are more durable, pay higher wages and include more fringe benefits, health insurances and retirement plans. See Brown/Hamilton/Medoff (1990) pp. 29 ff.; Dunne/Roberts (1991) pp. 216 ff.; Davis/Haltiwanger/Schuh (1996b) pp. 78 ff.; Dushi/Iams/Lichtenstein (2011) pp. 53 ff.; Kaiser Family Foundation and Health Research & Educational Trust (2016) p. 2.

²²⁷ See Solow (1956) pp. 65 ff.; Romer (1986) pp. 1002 ff.; Lucas (1988) pp. 3 ff.; Romer (1990) pp. S71 ff.; OECD (2001c) pp. 51 ff.

²²⁸ See Bresnahan/Greenstein/Henderson (2012) pp. 203 ff.; Bleda/Morrison/Rigby (2013) pp. 115 ff.

²²⁹ See Arrow (1962) pp. 609 ff.; Spengel/Müller-Rees/Endres/Harhoff/Heinemann/Hellwig/Hüther/Regierer/Schön/Stein (2009) pp. 4 ff.

economy as a whole benefits more than the innovator alone.²³⁰ When making the decision to invest and innovate, however, investors only take their personal returns into account. This leads to a suboptimal level of resources allocated to innovative activities and ultimately to social welfare losses.²³¹ Whether SME tax incentives represent an effective countermeasure against this market failure depends on their ability to spur additional SME activity that generates more innovations and positive spillovers than the investments that would have been undertaken in the absence of the incentives.

With regard to the relationship of firm size and innovativeness, there are two opposing views. While neo-classical theories suggest small firms to be particularly innovative as fierce competition and a lack of economies of scale force them to generate competitive advantages through product differentiation, the Schumpeterian view assumes large enterprises to be more innovative because only they have the market power to fully reap the benefits emanating from innovations.²³² According to the latter view, large firms are more suited to introduce innovative products to the market due to better management skills and better financial resources. They use previous research more efficiently and derive advantages from a superior division of labor.²³³ Moreover, their size allows them to better absorb the high share of fixed costs associated with innovative activities and to adequately diversify the related risks.²³⁴ Small businesses, on the other hand, exhibit easier and quicker decision-making due to leaner organizational structures. They can react faster to customer demands, which is an important advantage in recognizing and pursuing new ideas and business models. Furthermore, small firms and their employees may be more aware and more excited about minor innovations that are overlooked by large organizations.²³⁵

Ultimately, it is an empirical question whether SMEs' advantages in innovative activities outweigh their disadvantages and whether they are indeed more innovative than large enterprises. Existing evidence, however, does not give a clear answer to this question. While early empirical research by Horowitz (1962), Hamberg (1964) and Scherer (1965) rather sug-

²³⁰ For R&D activities – which are closely related to innovations – the overall rate of return for society is estimated to be on average twice as high as the internal rate of return of the enterprise performing the R&D (or even higher). See Baghana/Mohnen (2009) pp. 98 ff.

²³¹ See Adams/Jaffe (1996) pp. 700 ff.; Stiglitz (2015) p. 4.

²³² See Dasgupta/Stiglitz (1980) pp. 260 ff.; Reinganum (1985) pp. 275 ff.; Schumpeter (2010) pp. 71 ff.

²³³ See Acs/Audretsch (1990) pp. 54 f.; Verworn/Lüthje/Herstatt (2000) pp. 11 ff.

²³⁴ See Galbraith (1956) p. 87.

²³⁵ See Scherer (1980) p. 414 f.; Nooteboom (1994) pp. 333 ff.; Hoffmann/Parejo/Bessant/Perren (1998) pp. 44 f.; OECD (2009b) p. 120.

gests larger firms to be more innovative, Bound et al. (1984), Mowery (1983) and Cohen (1987) do not find a clear link between firm size and the propensity to spend on R&D.²³⁶ The results of these early studies need to be considered with caution, though, because they feature limited samples predominantly consisting of large enterprises. It is therefore questionable if the results allow valid conclusions about the SME sector. Moreover, the measurement of innovation is not trivial and results have been found to be highly dependent on the specific measures of innovation that are referred to.²³⁷ As a consequence, even the large body of more recent empirical literature does not come to a clear conclusion whether small or large enterprises are more innovative. Shefer and Frenkel (2005), Akcigit (2009), Park (2011) and Wolfe (2012), for example, observe small firms to spend more on R&D whereas Hong et al. (2016) find the opposite.²³⁸ Results with regard to innovative outputs – measured as the number of new processes, products or services – are equally contradictory. While Pavitt et al. (1987), Kleinknecht et al. (1993), Cogan (1993), Santarelli and Piergiovanni (1996), Stock et al. (2002) and Hong et al. (2016) attest a negative link between firm size and the number of innovations, Damanpour (1992), Camisón-Zornoza et al. (2004) and Laforet (2008, 2009, 2013) report a positive rapport.²³⁹ Tsai (2005) and Tsai and Wang (2005), on the other hand, assume a U-shaped relation between firm size and R&D productivity.²⁴⁰ Studies not finding a clear relation between firm size and innovativeness include Acs and Audretsch (1988), Symeonidis (1996), Wakasugi and Koyata (1997), Tether (1998), Freel (2005), Hausman (2005), Lee and Sung (2005), Laforet and Tann (2006) and Baregheh et al. (2016).²⁴¹

Altogether, the diversity of empirical results suggests that there is no linear, monotonic relationship between firm size and innovativeness applying across all industries, size

²³⁶ See Horowitz (1962) pp. 298 ff.; Hamberg (1964) pp. 62 ff.; Scherer (1965) pp. 12 ff. For further evidence, also see Comanor (1967) pp. 639 ff.; Scherer (1980) pp. 407 ff.; Meisel/Lin (1983) pp. 28 ff.; Mowery (1983) pp. 953 ff.; Bound/Cummins/Griliches/Hall/Jaffe (1984) pp. 21 ff.; Cohen/Levin/Mowery (1987) pp. 543 ff.

²³⁷ See Baldwin/Scott (1987) pp. 63 ff.; Acs/Audretsch (1990) pp. 9 ff.; Zimmermann/Andres (2001) pp. 532 f.; Fell/Hansen/Becker (2003) pp. 348 f.; Kock (2007) pp. 1 ff.; Schultz/Salomo/Talke (2013) p. 94.

²³⁸ See Shefer/Frenkel (2005) pp. 25 ff.; Akcigit (2009) pp. 1 ff.; Park (2011) pp. 1 ff.; Wolfe (2012) pp. 2 f.; Hong/Oxley/McCann/Le (2016) pp. 5379 ff.

²³⁹ See Pavitt/Robson/Townsend (1987) pp. 297 ff.; Kleinknecht/Reijen/Smits (1993) pp. 42 ff.; Cogan (1993) pp. 113 ff.; Santarelli/Piergiovanni (1996) pp. 689 ff.; Stock/Greis/Fischer (2002) pp. 537 ff.; Hong/Oxley/McCann/Le (2016) pp. 5379 ff.; Damanpour (1992) pp. 375 ff.; Camisón-Zornoza/Lapiedra-Alcami/Segarra-Ciprés/Boronat-Navarro (2004) pp. 331 ff.; Laforet (2008) pp. 753 ff.; Laforet (2009) pp. 188 ff.; Laforet (2013) pp. 490 ff.

²⁴⁰ See Tsai (2005) pp. 795 ff.; Tsai/Wang (2005) pp. 966 ff.

²⁴¹ See Acs/Audretsch (1988a) pp. 197 ff.; Symeonidis (1996) pp. 5 ff.; Wakasugi/Koyata (1997) pp. 383 ff.; Tether (1998) pp. 725 ff.; Freel (2005) pp. 123 ff.; Hausman (2005) pp. 773 ff.; Lee/Sung (2005) pp. 914 ff.; Laforet/Tann (2006) pp. 363 ff.; Baregheh/Rowley/Hemsworth (2016) pp. 768 ff. Inconclusive evidence also exists with regard to the correlation of firm size and the quality of innovations. See Akcigit (2009) pp. 1 ff.; Tether (1998) pp. 725 ff.

classes and countries. Innovation-related arguments do therefore not warrant the use of tax incentives basing eligibility solely on size criteria. And even if small firms were – on average – slightly more innovative than large enterprises, this does not mean that firm size is a good indicator of innovativeness because it is not the average investor (or investment) that matters but the marginal one. It is the investor in need of a tax incentive to actually make the investment who is relevant for the incentive's effectiveness. Given the skewed distribution of firms with regard to innovation²⁴² and the small number of actually innovative SMEs,²⁴³ the marginal SME investment can be assumed to not show the required positive attributes with respect to innovation and spillovers.

As firm size is an inaccurate proxy for innovation, other eligibility criteria should be referred to when targeting tax incentives at innovative investments and investors. In this respect, R&D activity is the obvious nexus. The link between R&D and innovativeness is much closer than the link between firm size and innovativeness.²⁴⁴ R&D tax incentives are therefore the superior instrument compared to SME-specific measures. Due to superior targeting, they are more effective and more efficient in generating innovations and positive spillovers.²⁴⁵

Given the adequacy of tax incentives supporting R&D investments, the most interesting question with regard to small and medium-sized enterprises is whether to restrict eligibility for R&D tax incentives to SMEs. In other words, is there a valid, economically sound justification for excluding large enterprises from R&D incentives or offering more generous re-

²⁴² See Baumol (1990) pp. 893 ff.; Hurst/Pugsley (2011) pp. 92 ff. Schultz/Salomo/Talke (2013) p. 94.;

²⁴³ Hurst and Pugsley (2011), for example, only find 17.3% of American small businesses to generate any intellectual property within the first four years of their existence. Even more astonishingly, less than 20% of the business founders in their sample expect R&D to make up a considerable share of their expenses and only 34.9% of the entrepreneurs think that they have a good business idea when starting their businesses. Piergiovanni and Santarelli (2006) confirm these trends as they estimate only 4.7% of new Italian businesses – which tend to be small – to be innovative. See Piergiovanni/Santarelli (2006) p. 268; Hurst/Pugsley (2011) p. 93.

²⁴⁴ Providing necessary knowledge, R&D often is the pre-requisite for the successful introduction of new products and technologies. However, R&D activities – even successful efforts – are not a perfect proxy for innovativeness either. The results of R&D activities still require entrepreneurial efforts and the accumulation of other production factors such as human and physical capital to transform the knowledge into marketable products and services. Moreover, innovation is not necessarily based on R&D. Especially in service sectors, innovations are mostly non-technological and related to a comparatively small amount of R&D. Gaillard-Ladinska et al. (2015) even assume R&D tax incentives not to be a determinant of a country's innovativeness. Overall, however, R&D spending still appears to target innovative enterprises much more precisely than firm size. See Acs/Audretsch (1988b) pp. 681 ff.; Zimmermann/Andres (2001) pp. 532 ff.; Braunerhjelm (2012) pp. 286 ff.; Trigo (2013) pp. 48 ff.; Braunerhjelm (2014) pp. 11 ff.; Gaillard-Ladinska/Non/Straathof (2015) p. 25.

²⁴⁵ Spengel et al. (2009) estimate a 1% decrease of the user cost of capital to induce a 1%-increase in R&D investments. (Some other studies report lower elasticities of R&D investments, though.) Moreover, the average overall rate of return on R&D investments (for the economy as a whole) is estimated to be about twice as high as the rate of return the enterprise performing the R&D can incur. See Spengel/Müller-Rees/Endres/Harhoff/Heinemann/Hellwig/Hüther/Regierer/Schön/Stein (2009) pp. 15 ff.

liefs for SMEs? In the European Union, there are currently several countries providing R&D incentives exclusively for SMEs or R&D incentives that are more generous for SMEs.²⁴⁶

There are indeed arguments in support of a more pronounced need for R&D tax incentives among SMEs than among large enterprises. First of all, small entities have been found to benefit less from direct subsidies and funding schemes for R&D projects than large businesses. Most likely, this is due to the regulatory burden associated with the application for such schemes.²⁴⁷ Tax incentives being especially generous for SMEs could correct for this imbalance as they are less prone to selection bias than direct subsidies.²⁴⁸ Even more importantly, small businesses are on average subject to more severe financing constraints and may therefore require tax reliefs in early investment stages more urgently.²⁴⁹ This is especially relevant for R&D projects as they are often more risky and include fewer tangible assets that can be liquidated if the project fails.²⁵⁰ As a consequence, obtaining capital becomes even more difficult for SMEs engaging in R&D.²⁵¹ For them, the respective projects often account for a large share of their overall business activity and can therefore hardly be compensated for by other successful projects in the event of failure. Large entities, in contrast, are better suited to diversify the related risks due to the large number of investment objects they are usually engaged in.²⁵² Financing constraints are thus less likely to prevent them from investing in R&D. In line with these considerations, R&D investments have actually been found to be more responsive to tax incentives in SMEs than in large enterprises. Moreover, deadweight losses arising from R&D incentives are higher for large enterprises.²⁵³ And as the principle of

²⁴⁶ These countries include Malta, the Netherlands (only start-ups) and the United Kingdom. In addition, France grants immediate refunds instead of carry forwards on the R&D. The UK uses an extended definition of SMEs. It includes thresholds that are twice as high as under the standard definition of medium-sized enterprises given by the European Union. Further countries (Finland, France, Italy, the Netherlands and Portugal) incorporate absolute caps for available reliefs which naturally affects large taxpayers more than SMEs and therefore represents an indirect advantage for small entities. See the country reports in Annex 1 for more detailed descriptions of the regimes.

²⁴⁷ The administrative burden related to the application of R&D tax incentives, however, can also be substantial for small businesses and absorb some of the benefits incurred. See Derregia/Chittenden (2007) p. 7.

²⁴⁸ In addition, they show superior properties with regard to investment neutrality, i.e., they are less prone to distorting the choice R&D projects undertaken. See Spengel (2016) pp. 409 ff.

²⁴⁹ See Section 4.1.4 for a detailed discussion of the financing constraints faced by SMEs.

²⁵⁰ See Stiglitz/Weiss (1981) pp. 393 ff.; Hsu (2004) pp. 1805 ff.; Hall/Lerner (2010) pp. 613 ff.; KfW Research (2016) pp. 8 f.

²⁵¹ SMEs and start-ups have experienced even more significant problems to finance R&D and other innovative activities since the economic crisis. See North/Baldock/Ullah (2013) pp. 244 ff.; OECD (2013b) pp. 22 ff.; OECD (2015) pp. 30 ff.

²⁵² See Honold (2015a) pp. 1 ff.

²⁵³ See Haegeland/Moen (2007) pp. 40 ff.; Baghana/Mohnen (2009) pp. 91 ff.; Castellacci/Lie (2015) pp. 819 ff.

efficiency requires the minimization of support for projects that would also be undertaken in the absence of tax incentives, restricting R&D tax incentives to SMEs may be warranted.

The restriction of eligibility for R&D incentives to SMEs, however, also causes additional costs. Above all, restrictions complicate the tax code and induce additional compliance and administrative costs. Furthermore, the implicit taxation of growth is a problem arising from the limitation of eligibility to SMEs. If incentives are not available beyond certain size thresholds, taxpayers are discouraged from growing and exceeding the respective thresholds.²⁵⁴ With regard to R&D projects (which tend to be high-risk, high return ventures), this may lead to the absurd situation of enterprises being better off if the projects are not too successful. In general, implicit taxes on growth are especially dangerous in sectors emphasizing R&D and innovation because innovation – as mentioned before – is closely related to growth. Conceptually, it would be inconsistent to provide incentives encouraging economic growth through innovation but also penalizing the firms that actually grow. Lastly, incentives exclusively available for SMEs obviously deteriorate the investment neutrality of the tax system. Investments by SMEs are favored and therefore need to generate lower pre-tax rates of return to be undertaken. This can lead to a misallocation of human and physical capital which could be especially harmful in the knowledge-intensive R&D sector where resources (e.g., qualified researchers) are scarce.²⁵⁵

Summing up, R&D tax incentives are the more efficient and effective instrument to spur innovative activity compared to SME tax incentives. The above-average innovativeness of SMEs – which is not even free of doubt considering the current body of empirical work – does not support the implementation of generally applicable SME incentives.²⁵⁶ Targeting R&D tax incentives at SMEs, however, may have its merits as the efficiency of the incentives is likely to increase and the losses in tax revenue to decrease. The benefit of targeting SMEs need to be carefully weighed against the costs, though. Moreover, incentive designs need to avoid explicit size restrictions (i.e., eligibility thresholds on turnover or the number of employees). Instead, maximum absolute reliefs on input-based measures should be applied to target smaller entities. This practice is comparatively easy to implement as no size criteria

²⁵⁴ See Holtz-Eakin (1995) p. 393.

²⁵⁵ See European Commission (2007a) pp. 22 ff.; Erkal/Scotchmer (2009) pp. 4 ff.; EFI (2012) pp. 61 ff.; European Commission (2014) pp. 16 ff.

²⁵⁶ In fact, general investment incentives may even have detrimental effects on R&D investments as required capital is encouraged to be spent on other assets and activities. See Manly/Thomas/Schulman (2015) p. 115.

have to be documented by taxpayers (nor controlled by tax administrations). Moreover, absolute caps on available reliefs prevent that firm growth is directly discouraged.²⁵⁷ At the same time, they provide policy-makers with an easy-to-handle instrument to control the revenue losses.²⁵⁸

4.1.4 *Financing Constraints*

The occurrence of market failure and related distortions can be a valid justification of tax incentives. The mere existence of market failure, however, does not suffice. Tax incentives also have to be effective in addressing the market failure and they should be the most efficient instrument to do so in order to represent a sensible policy instrument.²⁵⁹

Besides positive spillovers, asymmetric information is another market failure regularly associated with SMEs that may legitimize the usage of specifically targeted tax incentives. With regard to small businesses, harmful asymmetry primarily occurs between business insiders (i.e., owners and managers) and outside providers of capital.²⁶⁰ Naturally, an information gap between both parties exists for all kinds of businesses as insiders (almost) always have superior knowledge of their firms compared to external stakeholders.²⁶¹ The information gap and related problems in the acquisition of financing are particularly pronounced in the SME sector, though.²⁶² The reasons hereof are numerous. First of all, retrieving information on SMEs is more expensive for outsiders as they are usually not in the focus of capital market analysts and information is not as easily available.²⁶³ Their securities are usually less frequently traded than those of larger entities and the information conveyed by market pricing is likely to be less timely and relevant.²⁶⁴ The problem is further aggravated by the fact that many SMEs do not have to produce audited financial statements and that they are subject to fewer obligations to publicly disclose financial data. Obtaining information thus becomes

²⁵⁷ Intertemporal distortions, i.e., firms delaying investments to stay within the maximum, may be a side effect, though. As an alternative to thresholds restricting maximum eligible R&D expenditures, input-based incentives could also apply regressive rates in the determination of allowances or tax credits. Under these regimes, the preferential tax treatment of expenditures would not run out beyond the threshold but be granted at a smaller scale.

²⁵⁸ See European Commission (2015b) p. 151.

²⁵⁹ See Crawford/Freedman (2010) pp. 1077 ff.

²⁶⁰ See Ennew/Binks (1995) pp. 57 ff.; Cressy (1996) pp. 1253 ff.; Hall/Hutchinson/Michaelas (2000) pp. 297 ff.; Hsu (2004) pp. 1807 ff.

²⁶¹ See Fazzari/Hubbard/Petersen (1988) pp. 200 ff.; Diamond (1991) pp. 689 ff.; Audretsch/Elston (1997) p. 106.

²⁶² See Petersen and Rajan (1992) pp. 3 ff.; Berger/Udell (1998) pp. 613 ff.; Freel (2007) p. 25.

²⁶³ See Tucker/Lean (2003) pp. 51 ff.; Cassar (2004) pp. 266 ff.

²⁶⁴ See Diamond/Verrecchia (1981) pp. 221 ff.; Holmström/Tirole (1993) pp. 678 ff.

more laborious.²⁶⁵ And even if SMEs provide financial statements and other data on their businesses, the quality is often insufficient due to inadequate business skills, lower key internal reporting systems, insufficient self-presentation and a lack of intrinsic motivation to disclose information.²⁶⁶ The overlap of ownership and management in many small businesses is another factor impacting on outsiders' information deficits as it magnifies owners' head start in knowledge and their leeway in sharing the information they possess. Moreover, the finances of firms and their owners are more likely to mingle in owner-managed SMEs than in larger entities. The picture for outside investors thereby becomes even more nebulous.²⁶⁷

Theory suggests asymmetric information to induce adverse selection, in particular with regard to debt financing. As creditors are not able to adequately adjust interest rates to SMEs' individual characteristics and risks, they are likely to charge uniform interest rates that tend to be disproportionate relative to the idiosyncratic risks of many SMEs. As a consequence, only "bad risks" obtain loans whereas "good risks" refrain from accepting credits. The banks, in turn, further raise interest rates if only bad risks remain and the process of adverse credit selection is reinforced.²⁶⁸ Additionally, asymmetric information leads to inadequate monitoring of lenders and potential problems of moral hazard when lenders are enabled to take excessive risks. Even more good risks would thereby be turned into bad risks and interest rates inflate even further.²⁶⁹ In the end, lending to SMEs may become so unattractive that lenders are not willing to provide funds and credits rationing becomes a substantial obstacle for business growth that is almost impossible to overcome for individual enterprises.

Empirical evidence suggests that the aforementioned problems indeed cause an insufficient provision of capital for at least some SMEs²⁷⁰ and that the financing gap affects the

²⁶⁵ See Chittenden/Hall/Hutchinson (1996) p. 61 f.

²⁶⁶ See Mason/Harrison (2002) pp. 281 f.; Ball/Shivakumar (2005) pp. 83 ff.; Clark (2008) pp. 257 ff.; E-tredge/Johnstone/Stone/Wang (2011) pp. 866 ff.; Tysiac (2012) pp. 38 ff.; Hope/Thomas/Vyas (2013) pp. 1715 ff.; Liu/Skerratt (2014) pp. 3 ff.; OECD (2014) p. 50. Empirical evidence also shows that even the voluntary use of accrual accounting and the disclosure of such accounts only have a limited effect on SMEs' ability to obtain loans from banks. See Cassar/Ittner/Cavalluzzo (2015) pp. 242 ff.

²⁶⁷ See Aldrich/Cliff (2003) 573 ff.; OECD (2006) pp. 18 f.; OECD (2014) p. 50.

²⁶⁸ See Akerlof (1970) pp. 488 ff.; Stiglitz/Weiss (1981) pp. 393 ff.; Myers/Majluf (1984) pp. 187 ff.; Stiglitz/Weiss (1992) pp. 694 ff.; Lerner (1999) pp. 290 ff.

²⁶⁹ See Stiglitz/Weiss (1981) pp. 393 ff.

²⁷⁰ See Fazzari/Hubbard/Petersen (1988) pp. 200 ff.; Hyttinen/Väänänen (2006) pp. 323 ff.; TSO (2009) pp. 11 ff.; KfW Research (2016) p. 8; Donati (2016) pp. 1881 ff. Empirical evidence also suggests the financing gap to decrease in firm size within the group of SMEs, i.e., micro enterprises have greater difficulties to obtain funds than small and medium-sized enterprises. See IES (2005) pp. 140 ff.; BIS (2015) pp. 74 ff.

formation and the development these SMEs.²⁷¹ The true extent of the financing gap and its effects on social welfare are not clear, though.²⁷² Especially in industrialized countries, the financing gap is mostly limited to a rather small group of SMEs that tend to be young, innovative and characterized by above-average growth aspirations and the ensuing increased capital needs.²⁷³ The large majority of established businesses, in contrast, appear to have sufficient access to funds. Debt financing in particular is perceived to be rather unproblematic as banks have increasingly adjusted their business models to the requirements of SME lending and financial innovations have helped to adjust for SME particularities.²⁷⁴

If tax incentives are intended to compensate for inadequate capital supply, their primary focus should therefore be on the group of innovative, high-growth and mostly young SMEs. These businesses usually have the highest demand for capital²⁷⁵ but also feature some characteristics complicating the acquisition of funds.²⁷⁶ Debt financing and other traditional means of finance are usually of limited relevance for them due to the risks associated to their ventures. For outsiders, there is typically no or only little historic information to be evaluated and the business models as well as the management skills of owners and managers are unproven.²⁷⁷ Moreover, start-ups often incur losses in their first years and many investors prefer to only invest in more advanced stages of development.²⁷⁸ The lack of assets to pledge as collateral is another problem of newly founded SMEs that exacerbates obtaining capital.²⁷⁹ The problem is particularly severe for innovative start-ups centered around R&D activities. They usually focus on the generation of intangibles that cannot or only hardly be liquidated if the

²⁷¹ See Evans/Jovanovic (1989) pp. 808 ff.; Evans/Leighton (1989) pp. 525 ff.; Cooper/Gimeno-Gascon/Woo (1994) pp. 371 ff.; Holtz-Eakin/Joulfaian/Rosen (1994a) pp. 53 ff.; Holtz-Eakin/Joulfaian/Rosen (1994b) pp. 334 ff.; Blanchflower/Oswald (1998) pp. 26 ff.; EFI (2012) pp. 85 ff.; Donati (2016) pp. 1881 ff.

²⁷² See Hughes (1997) pp. 151 ff.; OECD (2006) p. 26; Crawford/Freedman (2010) pp. 1078 f.

²⁷³ See Audretsch/Lehmann (2004) pp. 340; IES (2005) pp. 138 ff.; Freel (2007) pp. 23 ff.; TSO (2009) pp. 16 ff.; Stucki (2013) pp. 1 ff.; Duarte/Matias Gama/Esperanca (2016) pp. 693 ff.

²⁷⁴ See Edwards (2000) p. 5 ff.; OECD (2006) p. 49; Robb/Robinson (2014) pp. 161 f. The deterioration of financing conditions due to the economic crisis, however, has been found to be especially harsh for SMEs. Moreover, a lack of debt financing for SMEs still represents a more significant problem in less developed emerging markets. See OECD (2006) pp. 20 ff.; TSO (2009) pp. 11 ff.; OECD (2014) p. 49; European Investment Bank (2015) pp 4 ff.

²⁷⁵ See North/Baldock/Ullah (2013) pp. 244 ff.

²⁷⁶ See Gompers/Lerner (2001) pp. 154 ff.; Audretsch/Lehmann (2004) pp. 340 ff.; Hsu (2004) pp. 1805 ff.

²⁷⁷ See Audretsch/Lehmann (2004) pp. 340 ff.; Revest/Sapio (2012) pp. 179 ff.; OECD (2014) p. 50.

²⁷⁸ The number of potential sources of finance typically increases in firm age for start-ups and young ventures. During the seed stage, owner and insider equity as well as debt are the primary sources of finance. In the following, during the early stage and the expansion stage, outside equity by venture capital investors and business angels becomes more relevant as the uncertainty about the market potential of the products and services decreases. Debt financing usually remains a source of finance through all phases of development of young enterprises. See TSO (2009) p. 8.

²⁷⁹ See Cowling/Mitchell (1997) pp. 430 ff.; Vogel/Adams (1997) p. 22 ff.; Duarte/Matias Gama/Esperanca (2016) pp. 693 ff.

venture fails. For investors, in particular creditors, the riskiness thereby increases significantly. As a consequence, they often refrain from providing capital and many innovative ventures have to rely on self-financing and outside risk capital financing more than other SMEs.²⁸⁰

Given this misallocation of capital, the question at hand is whether SME tax incentives do adequately address the problem. Interestingly, the group of SMEs most affected by financing constraints appears to be the same dynamic group that also accounts for disproportionately high rates of innovation and job creation. So there is a certain kind of SME which generates the positive spillovers sought by policy-makers and at the same time suffers the most from underinvestment due to asymmetric information. As already discussed, these firms only represent a very small fraction of the SME sector, though, and providing relief to enterprises of a certain size therefore constitutes a very inefficient way of fostering investments in innovative, high-growth SMEs. There are simply too many other small and medium-sized entities not falling into this category and a more accurate targeting with the help of additional eligibility criteria – as currently implemented for numerous input-based schemes – is highly problematic as well. The additional criteria are not very accurate indicators either, enhance the complexity of the schemes and introduce further distortions to the neutrality of the tax code.

In addition to being inefficient, the majority of currently available SME tax incentives also bear the risk of being ineffective in providing relief to the targeted group of young and innovative high-growth enterprises. Above all, special tax rates for SMEs, the most commonly used and most impactful form of SME tax incentives, are inept as they only take effect when investments generate positive returns, i.e., after the actual investment has been made and the information asymmetry causing financing constraints has been cut back significantly. Input-based tax incentives, in contrast, could provide substantial support to businesses confronted with an insufficient supply of capital. If designed appropriately, i.e., if refunds are granted, they are effective in the early stages of investments when returns are often low or even negative. Moreover, tying the relief to the size of investments ensures a better targeting of enterprises with growth aspirations.²⁸¹ In practice, however, refunds are rarely granted and

²⁸⁰ Even if successful, the results of R&D activities can only be capitalized in the late stages of the R&D process. This is problematic with regard to leverage ratios and other financial indicators that are crucial in obtaining capital. See Brown/Fazzari/Petersen (2009) pp. 151 ff.; Revest/Sapio (2012) pp. 179 ff.; Honold (2015b) pp. 197 ff.; Zimmermann (2015) p. 184.

²⁸¹ Input-based incentives, however, feature the risk of also supporting mere replacement investments. Moreover, they may distort investment decisions in favor of short-lived assets and – if only certain assets or activities are

even carry forwards are regularly limited. Moreover, the reliefs actually provided by input-based regimes are rather small compared to the savings incurred on special tax rates. It is thus questionable, in how far they really incentivize additional investments showing the intended favorable attributes and in how far they provide unnecessary relief to SME investments that would have been undertaken anyway and in large parts are not affected by financing constraints.²⁸²

Besides special tax rates and input-based incentives on the firm level, shareholder-level reliefs are another instrument that aims at providing eligible businesses with additional funds. They grant preferential tax treatment of dividends and capital gains from SME investments. Hence, such investments require a lower pre-tax rate of return to meet the expected after-tax rate of return.²⁸³ Investor-level incentives thereby seek to induce more external equity to be invested in the SME sector. Given that young enterprises often need to resort to risk capital from outside equity holders, shareholder-level reliefs could indeed be an effective instrument to close the financing gap of SMEs. On the other hand, investor-level incentives for SMEs could have adverse effects on capital allocation instead of improving it if the additional capital invested in the SME sector is withdrawn from more efficient alternative investments in large enterprises.²⁸⁴ Given that shareholder reliefs for private investors generally face the same problems related to targeting the right SMEs as firm-level measures, this kind of unintended capital reallocation is not unlikely. Shareholder-level incentives, however, provide the possibility of restricting the respective measures to venture capital funds and venture capital companies. The targeting of high-risk, high-growth firms is thereby relocated to the fund, which helps the accuracy as well as the collection costs incurred by tax administrations.²⁸⁵ The effectiveness of incentives for venture capital funds and companies, however, is only given if comparable entities (i.e., investment funds and investment companies) are not exempt from taxation anyway.²⁸⁶

eligible – in favor of certain kinds of investments that are deemed support-worthy. See Zee/Stotsky/Ley (2002) pp. 1504 f.

²⁸² See de Meza (2002) pp. F17 ff.; Nanda (2010) pp. 1 ff.

²⁸³ See OECD (2009a) p. 104.

²⁸⁴ See Klemm (2010) p. 324.

²⁸⁵ See Mason/Harrison (2001) p. 667; OECD (2010b) p. 11.

²⁸⁶ See Klemm (2010) p. 327.

Existing evidence also casts doubts on the effectiveness as well as the efficiency of shareholder-level incentives as research predominantly finds lower capital gains taxes to have positive albeit modest effects on the level of high-tech and early-stage venture investments. The amount of additional capital provided to SMEs could therefore be disproportionately small compared to the costs that are induced by market distortions and forgone tax revenues.²⁸⁷ In addition, the supply of capital could not even be the main reason for financial constraints. Instead, the problem may stem from the demand side as business owners refrain from taking up capital in fear of diluted ownership and control or the restrictions emanating from covenants.²⁸⁸ Moreover, owners of SMEs and their managers may forfeit opportunities for financing due to their unawareness of potential sources of funds.²⁸⁹ Obviously, tax incentives do not at all address these demand-side issues nor do they eliminate the actual sources of SME-specific asymmetric information relating to financial reporting, the quality of business planning, financial management and governance systems.

As a last argument against the use of tax incentives in the prevention of underinvestment in SMEs, empirical work has – at least up to now – not clearly identified the extent to which financial constraints of SMEs are really caused by asymmetric information (i.e., market failure). SMEs' problems in acquiring funds could actually be the result of a functioning market mechanism simply identifying alternative investments to be superior.²⁹⁰ In fact, capital markets have been found to function quite well even in the presence of imperfect information while the investment readiness of start-ups has been asserted to be inadequate in many cases.²⁹¹ So the government's ability to generate a more efficient equilibrium than the

²⁸⁷ See Poterba (1989) pp. 47 ff., Gompers/Lerner (1998) pp. 149 ff.; Keuschnigg/Nielsen (2003) pp. 175 ff.; Keuschnigg/Nielsen (2004) pp. 1011 ff.; Armour/Cumming (2006) pp. 596 ff.; da Rin/Nicodano/Sembenelli (2006) pp. 1699.

²⁸⁸ Both problems affect SMEs more than large enterprises where ownership mostly is fragmented anyway and covenants are often less restrictive due to existing collaterals and better risk diversification. See Myers (1984) pp. 575 ff.; Hutchinson (1995) pp. 231 ff.; Cressy/Olofsson (1997) pp. 87 ff.; Berggren/Olofsson/Silver (2000) pp. 233 ff.; Howorth (2001) pp. 78 ff.; Oakey (2007) pp. 223 ff.; Mason/Kwok (2010) p. 270 f.; OECD (2010b) pp. 3 ff.

²⁸⁹ See Van Auken (2001) pp. 240 ff.; Cressy (2006) pp. 106 f.

²⁹⁰ See IFS (2008) p. 227; Crawford/Freedman (2010) pp. 1078 f.

²⁹¹ See Mason/Harrison (1996) pp. 35 ff.; Feeney/Haines/Riding (1999) pp. 121 ff.; Mason/Kwok (2010) p. 269 ff. And even if there is a significant amount of market failure involved, a lack of knowledge about the extent makes the design of respective tax incentives almost impossible. Estimating the appropriate generosity of the relief would merely be a guessing game. See OECD (2009a) pp. 94 f.

market by redistributing capital resources to SMEs is doubtful. Accordingly, research generally recommends to refrain from direct policy intervention to close the financing gap.²⁹²

Summing up, the problem of asymmetric information aggravates the acquisition of capital for SMEs more than for large enterprises, which puts them at a competitive disadvantage and is likely to induce suboptimal levels of welfare. The extent of the problem is not clear, though.²⁹³ In developed financial markets, evidence suggests the financing gap of SMEs to primarily occur for equity financing of innovative and young SMEs with a high potential for growth. These enterprises require the most funds but often cannot sufficiently resort to traditional instruments of financing due to the risk structure of their ventures. Using firm-level incentives like special tax rates, tax allowances or tax credits is subject to the same problems in targeting the right group of businesses that are already described in the previous sections. On the shareholder level, preferential taxation of dividends and capital gains from all kinds of SME investments seriously deteriorates the investment neutrality of the tax code. Most likely, this results in major distortions of capital allocation that would outweigh the benefits of reducing SMEs' financing gap. A restriction to venture capital investments would more accurately target the SMEs producing positive externalities but – depending on the group of eligible investors – either the effectiveness or the practicality of this approach appears questionable. Financing constraints as a consequence of asymmetric information therefore do not constitute a strong argument for SME tax incentives either – especially in the way they are currently designed in the majority of countries.

4.1.5 *Socioeconomic Role of the SME Sector*

Besides the efficiency-driven rationale, there is also the view that socioeconomic considerations legitimize SME support. Following this line of thought, SMEs' role in expanding the middle class, in giving individuals the opportunity for economic advancement and in providing jobs for people who would find it difficult to obtain employment elsewhere makes

²⁹² See Coombes/Storey/Watson/Wynarczyk (1991) pp. 723 ff.; Holtz-Eakin (1995) p. 393; Wallis/Dollery (1999) pp. 23 ff.; Cressy (2002) pp. F14 f.; OECD (2010a) pp. 8 ff.; DeHaven (2012) pp. 1 ff. Research generally suggests that policy-makers should be more concerned about allowing good risks to differentiate themselves from bad risks in the market by means of signaling. Distortions emanating from asymmetric information are thereby minimized. Shareholder-level tax incentives, instead, aggravate the signaling mechanism because they support bad risks (i.e., enterprises generating insufficient cash flows) in mimicking good risks. See Chen/Mintz (2011) pp. 19 f.

²⁹³ See OECD (2013b) p. 29.

them worthy of government assistance.²⁹⁴ U.S. sources describe businesses run by women, minorities and immigrants as being of particular importance in their communities because they do not only create job opportunities for the less educated but also help in building social networks and informal capital markets. These businesses are a possible entry into the labor market for the less educated and supply social benefits not obtainable for them otherwise.²⁹⁵ Moreover, small businesses are claimed to secure a diversity in locally available services and products that cannot be provided by the large players and chains and are therefore highly valued by the respective communities.²⁹⁶ Altogether, SME tax incentives may thus be justified by wider social issues.

The social benefits of SME activities, of course, are difficult to quantify. While empirical studies indeed find SMEs to provide a disproportionately large share of jobs to underqualified individuals, their impact on the diversity of available products and services is hardly measurable. Even if the prominent, socioeconomic role of small businesses is taken for granted, though, it is hard to make the case for tax incentives. If customers value the supply of certain products and services, for example, they will pay for them accordingly. There is no need for support through the tax system. With regard to employment and social advancement, it seems illogical to link support to firm size – at least if being the only eligibility criterion. If the hiring of certain employees is intended, then support should be awarded for hiring, not for being a small enterprise. In the end it boils down to the same line of argumentation already pursued in connection with the general role of the SME sector for the economy: Just because SMEs are important, they do not need to be provided with tax advantages. Just because they hire more underqualified people, they do not necessarily hire even more underqualified people when being subject to preferential tax rates. So if socioeconomic goals are the rationale behind SME tax incentives, support schemes should rather address these goals directly and not take firm size as a proxy for other firm characteristics. And under most circumstances, non-tax measures are probably the more effective, the more efficient and the more sustainable way of achieving socioeconomic goals.²⁹⁷

²⁹⁴ See Quadrini (1999) pp. 1 ff.; Guenther (2009) pp. 20 ff.; Headd (2010) p. 6; Gravelle/Lowry (2012) p. 11.

²⁹⁵ See Brush/Hisrich (1999) pp. 111 ff.; Butler/Greene (1999) pp. 129 ff.

²⁹⁶ See Anonymous (2011) p. 139 f.

²⁹⁷ See Avi-Yonah (2006) pp. 22 ff.

4.2 *Structural Disadvantages of SMEs Emanating from the Tax System*

4.2.1 *Incomplete Loss Offset*

As the commonly used non-tax arguments appear questionable as a justification of SME tax incentives, an adequate reasoning for providing such incentives may be rooted in the tax system itself. If the tax system discriminates against small and medium-sized firms, it creates inefficiencies in the allocation of resources and a level of investment in SMEs that is not optimal with regard to overall social welfare. Following this line of argumentation, tax incentives could serve as a compensation aiming at a minimization of the distortions induced by the tax system and at reducing the level of underinvestment in SMEs. In order to assess the validity of this argument, it needs to be examined if structural tax-induced disadvantages for SMEs really exist and if tax incentives are the appropriate measure to address them. The latter, of course, hinges on the effectiveness and efficiency of SME tax incentives, i.e., their ability to provide relief to those businesses negatively affected by structural discrimination of the tax system and to do so at reasonable costs.

Asymmetric treatment of profits and losses is a basic feature of modern income taxation. Taxpayers generally have to pay taxes on positive income – either corporate or personal income tax – whereas they do not receive any payments if they incur losses. If the government only participates in positive returns, taxation discriminates against investment projects bearing a greater risk of incurring losses. Income taxation may thus discourage risk-taking.²⁹⁸ The problem is at least partly alleviated as businesses and their owners can offset losses against other positive income – either from other sources of income (e.g., employment income or capital income) or against income from past and future years.²⁹⁹ Not in all situations, however, taxpayers have positive income to be offset, which becomes even more likely as loss offsets are restricted. Hence, limitations to intra and inter-periodic loss offsets increase the danger of risk-taking being discouraged by income taxation. In practice, this may show on two levels: Either investors abstain from equity investments in risky ventures or the businesses themselves take fewer risks.³⁰⁰

²⁹⁸ See Gentry/Hubbard (2005) pp. 87 ff.; Cullen/Gordon (2007) pp. 1479 ff.

²⁹⁹ Corporations by definition only incur business income. Naturally, there is no other income than business income and they can only offset losses against other years' income. See IBFD (2015) pp. 47 ff.; Jacobs/Scheffler/Spengel (2015) p. 167.

³⁰⁰ See Cooper/Franks (1983) p. 581; Kregel (2006) pp. 255 ff.

Table 19 displays the major restrictions applying to the offset of business losses in corporate and personal income taxation in the EU. Notably, only five countries allow losses to be carried back and if they do, the carry back is mostly limited to one year. Provisions on carry forwards are more generous. For corporate losses, 15 countries do not have any constraints with regard to time and in the remaining countries losses can be carried forward for at least four years. Annual offsets are limited as a percentage of taxable income in nine countries and as a percentage of the loss carried forward in one country. Under the personal income tax, numerous countries have time limits in place (16) while only two countries restrict the amount of losses to be offset. In addition, the offset against non-business income is banned in ten countries and limited to certain income sources in four countries. Capital losses incurred on shareholdings can only be offset against other income in a couple of Member States. As a last major restriction, 17 countries apply loss trafficking rules, i.e., limitations to loss carry forwards if the ownership in a company changes at least partly.

The first question at hand is whether these restrictions affect SMEs more severely than large enterprises. This would generally be the case if SMEs were more likely to incur losses. The AMADEUS data used to generate the model companies in Section 3.2 indeed indicates the return on invested capital to be the lowest for micro enterprises and the return on equity to continuously increase in firm size. Moreover, SMEs are active in a smaller number of markets with a smaller number of products and services. Their business risks are less diversified and their incomes more volatile.³⁰¹ Hence, SMEs should indeed be more affected by limited loss carry forwards and loss offsets than their larger counterparts.³⁰² Even more than an “average SME”, start-ups and young, high-risk ventures are prone to incur negative income as significant losses upfront are a usual occurrence for them.³⁰³ Upcoming start-ups are also particularly affected by loss trafficking rules as a buyout as well as the participation of venture capitalists and business angels potentially triggers the extinction of loss carry forwards.³⁰⁴ Moreover, time limits on carry forwards of four or five years as implemented in

³⁰¹ See Moore/Garnsey (1993) p. 508; OECD (2006) p. 47; BIS (2015) p. 46.

³⁰² See OECD (2009a) p. 28.

³⁰³ See Allen (2012) pp. 12 ff.; EY (2013) pp. 13 ff.

³⁰⁴ See Blöchle/Schmidt (2015) pp. 217 f.; Geberth (2016) p. M5.

numerous countries³⁰⁵ may severely restrict start-ups' ability to deduct initial losses later on.³⁰⁶

Although SMEs indeed appear to suffer more from limited loss offsets, it is questionable if that really distorts investment decisions, i.e., leads to underinvestment in the SME sector. First of all, tax planning may at least alleviate the effects of the limitations, especially for start-ups who usually expect to incur upfront losses and should adjust accordingly.³⁰⁷ Secondly, investors have not been found to pay much attention to loss offset regulations in their investment decisions.³⁰⁸ But even if they did, the SME tax incentives analyzed in Section 3 are not the right measure to compensate for limited loss offsets because the link between firm size and the propensity to be affected by restricted loss offsets is only weak. The targeting of special tax rates or tax credits for SMEs would thus be poor if a compensation for limited loss offsets was intended. Moreover, the design of currently available SME incentives suggests that such a compensation is not the goal as special tax rates and non-refundable input-based incentives only benefit taxpayers with positive income.

If the issue of incomplete loss offsets is perceived to be a major problem for the SME sector, policy-makers should thus address the issue directly and reduce the respective restrictions – ideally for all kinds of companies. Alternatively, more generous provisions could be offered exclusively to new enterprises in order to prevent excessive losses in tax revenues. This would introduce another distortion to the tax system but at least firm age would be a more accurate indicator than firm size to target businesses that are likely to be actually affected by limited loss offsets. Moreover, it is an easy-to-track indicator which is less prone to misuse and accounting policies than firm size.

³⁰⁵ In corporate income taxation, eight countries apply limits of five years or less. Within the personal income tax, twelve countries have a cap of five years or less.

³⁰⁶ See Chen/Lee/Mintz (2002) p. 17.

³⁰⁷ See Blöchle/Schmidt (2015) pp. 216 ff.

³⁰⁸ See Niemann (2004) p. 359 ff.; Jacob/Pasedag/Wagner (2011) p. 78.

Table 19: Loss compensation rules for business losses in the EU (2015)

Country	CIT loss offset					PIT loss offset					
	Carry back		Carry forward			Carry back		Carry forward			
	Time limit	Max. offset	Time limit	Max. offset	Loss trafficking	Time limit	Max. offset	Time limit	Max. offset	Offset against other income sources	
										Business losses	Capital losses
Austria	-	-	unlimited	75% of income	no	-	-	unlimited	unlimited	yes	no
Belgium	-	-	unlimited	none	yes	-	-	unlimited	unlimited	no	no
Bulgaria	-	-	5 years	none	yes	-	-	5 years	unlimited	no	no
Croatia	-	-	5 years	none	no	-	-	5 years	unlimited	yes	no
Cyprus	-	-	5 years	none	yes	-	-	5 years	unlimited	yes	yes
Czech Rep.	-	-	5 years	none	yes	-	-	5 years	unlimited	limited	limited
Denmark	-	-	unlimited	none	yes	-	-	unlimited	unlimited	yes	no
Estonia	-	-	-	-	-	-	-	7 years	unlimited	yes	no
Finland	-	-	10 years	none	yes	-	-	10 years	unlimited	yes	limited
France	1 year	1 million	unlimited	€ 1m + 50% of inc.	no	-	-	5 years	unlimited	yes	limited
Germany	1 year	1 million	unlimited	€ 1m + 60% of inc.	yes	1 year	€ 1 m.	unlimited	€ 1m + 60% of inc.	yes	no
Greece	-	-	5 years	none	no	-	-	5 years	unlimited	yes	no
Hungary	-	-	5 years	50% of income	no	-	-	unlimited	unlimited	limited	limited
Ireland	1 year	unlimited	unlimited	none	yes	3 years ¹	unlimited	unlimited	unlimited	yes	no
Italy	-	-	unlimited	80% of income	yes	-	-	5 years ²	unlimited	yes	no
Latvia	-	-	unlimited	none	yes	-	-	3 years	unlimited	yes	no
Lithuania	-	-	unlimited	70% of income	no	-	-	unlimited	unlimited	no	no
Luxembourg	-	-	unlimited	none	yes	-	-	unlimited	unlimited	no	no
Malta	-	-	unlimited	none	no	-	-	unlimited	unlimited	yes	no
Netherlands	1 year	unlimited	9 years	none	yes	3 years	unlimited	9 years	unlimited	limited	limited
Poland	-	-	5 years	50% of loss	yes	-	-	5 years	50% of loss	no	no
Portugal	-	-	12 years	70% of income	yes	-	-	12 years	unlimited	no	no
Romania	-	-	7 years	none	no	-	-	5 years	unlimited	no	no
Slovakia	-	-	4 years	none	no	-	-	4 years	unlimited	no	no
Slovenia	-	-	unlimited	50% of income	yes	-	-	unlimited	unlimited	no	no
Spain	-	-	unlimited	50%/25% of inc.	no	-	-	4 years	unlimited	yes	no
Sweden	-	-	unlimited	none	yes	-	-	unlimited	unlimited	no	no
UK	1 year	unlimited	unlimited	none	yes	1 year	unlimited	unlimited	unlimited	limited	no

Note: Data was retrieved from ibfd.org.

As already discussed, the focus of many policy-makers is on innovative high-risk, high-growth start-ups which generate positive externalities to the benefit of the economy as a whole. With regard to these enterprises, two restrictions to loss offsets and carry forwards should receive special attention. Above all, loss trafficking provisions represent an impediment as venture capital investors and business angels regularly acquire qualified shareholdings in high-growth start-ups. If loss trafficking rules are too restrictive, i.e., if they already kick in for minor ownership changes, the initial losses incurred by these businesses run the risk of being annihilated for tax purposes.³⁰⁹ This, in turn, might discourage or at least slow down the obtainment of outside capital by start-ups. Moreover, loss trafficking rules potentially depress the selling price upon exit for the founders of start-ups, thus making investments in start-ups less attractive.³¹⁰ Secondly, start-ups may suffer from too restrictive time limits for carry forwards. If it takes them several years to generate net profits, four or five-year carry forwards may not suffice to fully offset the initial losses, especially if combined with limits on annual offsets (e.g., in Hungary and Poland).³¹¹

Summing up, incomplete loss offsets on carry forwards may indeed affect small and medium-sized enterprises more severely than large enterprises.³¹² Special tax rates, tax credits, allowances or depreciation schemes for SMEs, however, are not the appropriate countermeasures. Instead, it would be more effective and efficient to directly address the problem by granting more generous loss carry forwards and offsets. In particular, legislators should avoid loss trafficking rules that discourage investments in high-growth start-ups.

4.2.2 *Debt Bias*

Most income tax systems treat equity and debt finance differently. While interest payments on debt are usually deductible from taxable income, dividend payments are not (or only to a limited extent).³¹³ As a consequence, interest payments lower taxable business income and are exclusively taxed in the hands of the recipient of the interest whereas dividends are subject to double taxation on the corporate and on the shareholder level (see Figure 8 in

³⁰⁹ See Blöchle/Schmidt (2015) pp. 217 f.

³¹⁰ Following this rationale, the German government has recently relaxed loss trafficking provisions for start-ups. See Geberth (2016) p. M5.

³¹¹ See OECD (2009a) p. 90.

³¹² For countries implementing absolute caps on annual loss offsets (France, Germany), the opposite could also be argued as the threshold of € 1 million is more likely to be reached by large entities than by SMEs.

³¹³ See IBFD (2015) pp. 47 ff.

Section 4.2.3). For transparently taxed entities, the problem of double taxation does not exist because there is only one level of taxation. Disadvantages for equity financing, however, may arise if business and capital income are subject to different tax rates (progressive vs. proportional).³¹⁴

The discrimination against equity financing constitutes a structural disadvantage for SMEs if they have more problems to obtain debt financing than large entities and if they have more difficulties to effectively deduct interest payments from the tax base due to a lack of positive taxable income. In general, large firms may indeed be better positioned to obtain debt financing as they often represent better risks for creditors. They possess more assets that can serve as collateral and offer better risk diversification as a result of a broader range of products and services being sold at the market. The lack of risk diversification also makes small businesses more prone to losses and thus to the danger of not being able to effectively deduct interest expenses. Moreover, lending to small firms could be less profitable in view of the fixed costs related to giving loans and the problems in obtaining information about lenders.³¹⁵

As outlined in Section 4.1.4, however, SMEs as a whole do not necessarily have problems in obtaining debt capital. Banks have increasingly adapted to the challenges of lending to small businesses and the financing gap has at least been narrowed for debt financing. The AMADEUS data used for the calculation of effective tax burdens in Section 3 also shows the average equity ratio of SMEs to exceed that of large enterprises only slightly.³¹⁶ In addition, the challenges of lending to small businesses do not necessarily have to prevent debt financing altogether. Instead, they may merely increase the interest rates imposed on affected entities.³¹⁷ The deductibility of interest payments would then rather benefit SMEs than it would hurt them. Hence, it appears that SMEs do not generally suffer from the debt bias in income taxation. It is rather a certain group of SMEs not being able to obtain debt financing and not being able to deduct interest payments due to a lack of positive taxable income. This group primarily includes start-ups and gazelles. Their success is often based on new ideas and

³¹⁴ See Section 3.1.2.1 for an overview of applicable personal income tax rates on business income and capital income in the Member States of the European Union.

³¹⁵ See Freel (2007) pp. 23 ff.; OECD (2006) pp. 34 ff. For a more detailed discussion of factors leading to SMEs' credit rationing, also see Section 4.1.4.

³¹⁶ The average equity ratio amounts to 47.35% for micro enterprises, 51.06% for small enterprises and 44.37% for medium-sized enterprises compared to 42.57% for large entities. See Section 3.2.1.

³¹⁷ See OECD (2013b) pp. 22 ff.; OECD (2015) pp. 40 f.

technologies that are unsuitable to serve as collateral and they lack proven track records of their business models and abilities, which aggravates the obtainment of loans.³¹⁸

Given that the majority of SMEs have sufficient access to debt financing as well as positive income to deduct interest payments from, it does not make sense to provide general tax incentives to SMEs as a compensation for the debt bias, e.g., in the form of special tax rates, special depreciation schemes or tax credits on certain kinds of investments. In fact, such incentives rather tend to benefit those businesses without negative income and without a shortage in available debt financing. The debt bias therefore does not constitute a justification of these kinds of incentives. Measures effectively addressing the debt bias need to embrace the problems arising from it and target affected firms more accurately.

A few incentives aim more specifically at alleviating financing-related issues. In Belgium, for example, an additional 0.5% of notional interest can be deducted from taxable income by small enterprises and in Portugal 5% of initial capital contributions and capital increases can be deducted by SMEs. Obviously, both measures do not improve the access to debt financing but they make equity financing more attractive with regard to taxation and could indeed reduce the debt bias. It is questionable, though, in how far they really support the taxpayers being most affected, i.e., loss-making firms. In the absence of refunds, these enterprises do not benefit from additional deductions, especially if carry forwards are not allowed. In Hungary, the tax credit of 60% on interest payments even has an adverse effect as it extends the debt bias rather than reducing it. The taxation of debt financing becomes even more advantageous and therefore constitutes an even bigger disadvantage for taxpayers suffering from the debt bias.³¹⁹

Shareholder-level incentives are another group of regimes that may positively affect SMEs heavily relying on equity financing. They limit the double taxation of proceeds derived from equity investments and thereby reduce the debt bias. Once again, however, the group of SMEs having the most problems in obtaining debt financing and in effectively deducting interest payments due to incurred losses may not benefit – at least as long as they still make losses. During this time, firms are unlikely to pay dividends and their shareholders may not be able to realize capital gains. Reduced shareholder taxation therefore does not provide immedi-

³¹⁸ See IES (2005) pp. 140 f.; Freel (2007) pp. 23 ff.; Kerr/Nanda (2015) pp. 446 ff.

³¹⁹ However, the regime may have its merits, if SMEs are put at a competitive disadvantage because of excessive interest rates on small business loans. These would be reduced effectively. See Section 4.1.4.

ate relief and only kicks in as the respective SMEs generate positive returns. At this time, affected businesses could probably obtain debt financing anyway and the debt bias would no longer put them at a competitive disadvantage.

Altogether, the debt bias does not constitute an adequate argument for providing SME tax incentives in their current form, especially if the incentives do not directly relate to the taxation of equity financing (either at the firm level or at the shareholder level). There is simply no clear link between firm size and the inability to acquire loans. If the discrimination against equity financing is indeed perceived to be a problem, policy-makers should rather directly tackle the problem instead of trying to alleviate one distortion (equity vs. debt) by introducing another (SME vs. large). The debt bias could, for example, be addressed by generally reduced shareholder taxation or by aligning the treatment of payments on debt and equity on the firm level.³²⁰

4.2.3 *Double Taxation of Corporate Profits*

In most EU countries, corporate income is taxed on the corporate level as soon as profits are incurred and on the shareholder level when profits are distributed or capital gains are realized upon the disposal of participations (see Table 20).³²¹ In practice, the double taxation of corporate profits negatively affects the success of the SME sector in several ways. First, it may prevent business creation. If the overall level of taxation and the hurdle after-tax rate of return of newly founded businesses becomes too high, dependent employment and alternative capital market investments could be more attractive and prevent businesses from being started.³²² Employment income and alternative capital market investments, however, are also subject to taxes that are not necessarily lower.³²³ In fact, most of the tax systems in the EU and other developed countries do not feature full double taxation of corporate profits.

³²⁰ Generally, there are two approaches to addressing the difference in treatment of equity and debt on the firm level. Either the deduction of interest payments on the firm level is abolished (or limited) or (notional) allowances on equity capital are granted (as in Belgium, Italy and Portugal). However, both approaches bear some problems. Notional interest deductions on equity induce substantial losses in tax revenues as well as additional administrative efforts and tax planning opportunities for taxpayers. Restricting interest deductions on debt, on the other hand, tends to lead to more complexity and makes the general investment climate less attractive. See Klemm (2007) pp. 229 ff.; Schreiber/Overesch (2007) pp. 816 ff.; Finke/Heckemeyer/Spengel (2014) pp. 1 ff.; Vogel (2014) pp. 91 ff.

³²¹ See IBFD (2015) pp. 47 ff.

³²² See OECD (2009a) p. 87.

³²³ See Table 21 for a comparison of top marginal rates in the personal and the corporate income tax (including dividend taxation). In fact, the average top PIT rate across all EU Member States is higher than the nominal tax rate on corporate income.

Mostly, shareholder relief systems or imputation systems reduce tax wedges between the overall tax rate on corporate profits and the top PIT rate to a minimum or even create an advantage for corporate profits (see Table 21 and Figure 8).³²⁴ In view of these relief mechanisms, it appears highly questionable if businesses not being started due to corporate double taxation should be founded in the first place. Most likely, a true entrepreneur would not be deterred from starting a business by a minor tax wedge, especially as the non-corporate form of business not being subject to double taxation is also available.

Secondly, double taxation may slow down businesses' growth as it prevents incorporation.³²⁵ In fact, the choice of legal form has been found to be impacted by tax considerations, most notably differences in nominal tax rates.³²⁶ The welfare losses induced by the distortion of legal form choice are unclear, though. If investment decisions were distorted by the choice of legal form and the acquisition of funds was prevented, double taxation could indeed prevent firms from growing.³²⁷ As mentioned above, the size of the tax wedges in most EU countries is not very big, though. Hence, it appears unlikely that enterprises with substantial growth aspirations would 1) really abstain from incorporation because of a minimal tax rate advantage and 2) have their growth aspirations halted by being non-corporate. And even if that was the case, an improved alignment of (generally applicable) corporate and non-corporate income tax rates would be the better response to the problem than the SME tax incentives discussed in Section 3.

Lastly, double taxation could prevent SMEs' success because shareholder taxation increases the cost of equity capital. The increase is likely to be more pronounced for SMEs than for large enterprises as the shareholder clienteles of both groups distinguish. Large corporations usually have access to international financial markets where shareholder taxes are neglected.³²⁸ In contrast to that, SMEs are more reliant on domestic, small-scale investors for whom shareholder taxation plays a significant role. As a result, SMEs incur higher cost of

³²⁴ As personal rates are mostly progressive, the top marginal rates in Table 21 overestimate the nominal tax burden of unincorporated businesses in the majority of countries. The numbers should therefore be considered with caution and not be compared directly. Business owners, however, tend to be in the upper brackets of the progressive schedule so that the rates displayed in Table 21 should provide a reasonable idea of the options entrepreneurs face when choosing the legal form of their businesses. See Gravelle/Lowry (2012) p. 3.

³²⁵ See OECD (2009a) pp. 87 f.

³²⁶ See Gordon/MacKie-Mason (1994) pp. 279 ff.; MacKie-Mason/Gordon (1997) pp. 477 ff.; Goolsbee (1998) pp. 143 ff.; Goolsbee (2004) pp. 2283 ff.; de Mooij/Nicodème (2008) pp. 478 ff.; Liu (2014) pp. 387 ff.

³²⁷ See Wagner (2006) pp. 101 ff.

³²⁸ See Spengel (2003) p. 92; OECD (2010a) p. 126.

capital that – even if exclusively stemming from taxation – constitute a competitive disadvantage and could cause SMEs to be pushed out of the market.³²⁹

Table 20: Personal income tax rates on dividends and capital gains in the EU (2015)

Country	Personal income tax rate on dividends	Personal income tax rate on capital gains (shares)
Austria	• 25%	• 25%
Belgium	• 25%	• 0%
Bulgaria	• 5%	• 0%
Croatia	• 12%	• 0%
Cyprus	• 17%	• 0%
Czech Republic	• 15%	• 15%
Denmark	• up to DKK 49,900: 27% • over DKK 49,900: 42%	• up to DKK 49,900: 27% • over DKK 49,900: 42%
Estonia	• 20%	• 20,00%
Finland	quoted companies: • 15% of dividend exempt • 85% of dividend taxable – up to €30,000: 30% – over €30,000: 34% unquoted companies: • 75% of dividend exempt up to €150,000 and the rest taxed like dividends from quoted companies • 25% of dividend taxable – up to €30,000: 30% – over €30,000: 34%	• up to €30,000: 30% • over €30,000: 34%
France	• 60% of dividend taxed at progressive PIT rates (0–45%)	• progressive PIT rates (unless SME-related incentives apply; 0–45%)
Germany	• if participation > 25% or optional if participation > 1% and shareholder works for company: progressive PIT rates on 60% of dividend (0–45%) • if participation < 1% or optional if participation < 25% and shareholder works for company: flat rate tax (26,38%)	• if participation > 1%: progressive PIT rates (0–45%) • if participation < 1%: 25%
Greece	• 10%	• if participation > 0.5%: 15% • if participation < 0.5%: 0%
Hungary	• 16%	• 16%
Ireland	• 20%	• 33%

³²⁹ See Spengel/Bergner (2015) pp. 20 ff. The actual size of the problem is unclear, though. On the one hand, higher cost of capital could be avoided by choosing non-corporate legal forms. This strategy, of course, hinges on the tax rates imposed on non-corporate business income as well as potential non-tax factors speaking against or in favor of the corporate form. On the other hand, the problem of increased cost of capital could be further aggravated as taxes on dividends and capital gains induce the so-called lock-in effect, which causes firms to not distribute profits and shareholders to abstain from selling their shares in order to avoid shareholder-level taxes. As a consequence, available capital for new and expanding firms becomes even more scarce and expensive. The lock-in effect, of course, primarily affects new ventures and high-growth firms whereas well-established SMEs with stable cash flows may rather benefit from investors' hesitance to divest. See Dai/Maydew/Shackelford/Zhang (2008) pp. 709 ff.; OECD (2009a) p. 89; Gentry (2016) pp. 321 ff.

Country	Personal income tax rate on dividends	Personal income tax rate on capital gains (shares)
Italy	<ul style="list-style-type: none"> qualified: progressive rates on 49.72% of dividend unqualified shareholdings: flat rate tax (26%) qualified holding requires 20% of voting rights or 25% of capital for unlisted companies and 2% and 5%, respectively for quoted companies 	<ul style="list-style-type: none"> qualified holding: progressive rates on 49.72% of dividend unqualified shareholdings: flat rate tax (26%) qualified holding requires 20% of voting rights or 25% of capital for unlisted companies and 2% and 5%, respectively for quoted companies
Latvia	<ul style="list-style-type: none"> 10% 	<ul style="list-style-type: none"> 15%
Lithuania	<ul style="list-style-type: none"> 15% 	<ul style="list-style-type: none"> 15%
Luxembourg	<ul style="list-style-type: none"> 15% 	<ul style="list-style-type: none"> if participation > 10%: progressive PIT rates (0–40%) reduced by 50% if participation < 10%: 0%
Malta	<ul style="list-style-type: none"> 0% 	<ul style="list-style-type: none"> 15% flat tax or progressive rates (exempt if listed on Malta Stock Exchange)
Netherlands	<ul style="list-style-type: none"> if shareholding > 5%: 25% if shareholding < 5%: exemption of dividend but notional tax of 1.2% on value of net financial assets (applicable allowance: €21,330) 	<ul style="list-style-type: none"> if shareholding > 5%: 25% if shareholding < 5%: exemption of capital gains but notional tax of 1.2% on value of net financial assets (applicable allowance: €21,330)
Poland	<ul style="list-style-type: none"> 19% 	<ul style="list-style-type: none"> 19%
Portugal	<ul style="list-style-type: none"> 28% or progressive tax rate on 50% of dividends 	<ul style="list-style-type: none"> 28%
Romania	<ul style="list-style-type: none"> 16% 	<ul style="list-style-type: none"> 16%
Slovakia	<ul style="list-style-type: none"> 0% 	<ul style="list-style-type: none"> progressive tax rates (19–25%)
Slovenia	<ul style="list-style-type: none"> 25% 	<ul style="list-style-type: none"> tax rate depending on holding period: <ul style="list-style-type: none"> – until 5 years after acquisition: 25% – 5 years after acquisition: 20% – 10 years after acquisition: 15% – 15 years after acquisition: 10% – 20 years after acquisition: 5% – 25 years after acquisition: 0%
Spain	<ul style="list-style-type: none"> savings income: <ul style="list-style-type: none"> – up to €6,000: 20% – €6,000 to €50,000: 22% – over €50,000: 24% 	<ul style="list-style-type: none"> savings income: <ul style="list-style-type: none"> – up to €6,000: 20% – €6,000 to €50,000: 22% – over €50,000: 24%
Sweden	<ul style="list-style-type: none"> 30% 	<ul style="list-style-type: none"> 30,00%
UK	<ul style="list-style-type: none"> up to total income of GBP 31,785: 0% (=10% - 10%) total income from GBP 31,785 to GBP 150,000: 25% (= 32.5% - 7.5%) total income over GBP 150,000: 30.6% (=37.5% - 6.9%) 	<ul style="list-style-type: none"> up to GBP 5,500: 0% up to total income of GBP 31,785: 18% total income over GBP 31,785: 28%

Note: Data was retrieved from ibfd.org.

SME tax incentives on the firm level, however, appear to be an inadequate remedy. Compensating for one distortion by adding another is unlikely to create better overall neutrality, especially if the taxpayers affected by the initial distortion are not targeted accurately. With regard to targeting, addressing the shareholder level directly is the superior approach.

Shareholder-level incentives, however, introduce distortions and discriminate against non-qualifying investments in large enterprises as well. In particular, special investment allowances as in France and Ireland do not provide a level playing field but rather revert a likely SME discrimination into a large business discrimination.³³⁰ In addition, the commonly used explicit size criteria come along with the same problems as on the firm level: more complexity in the tax system and a potential discouragement of growth.³³¹

Table 21: Tax wedge for corporate and non-corporate business income in the EU (2015)

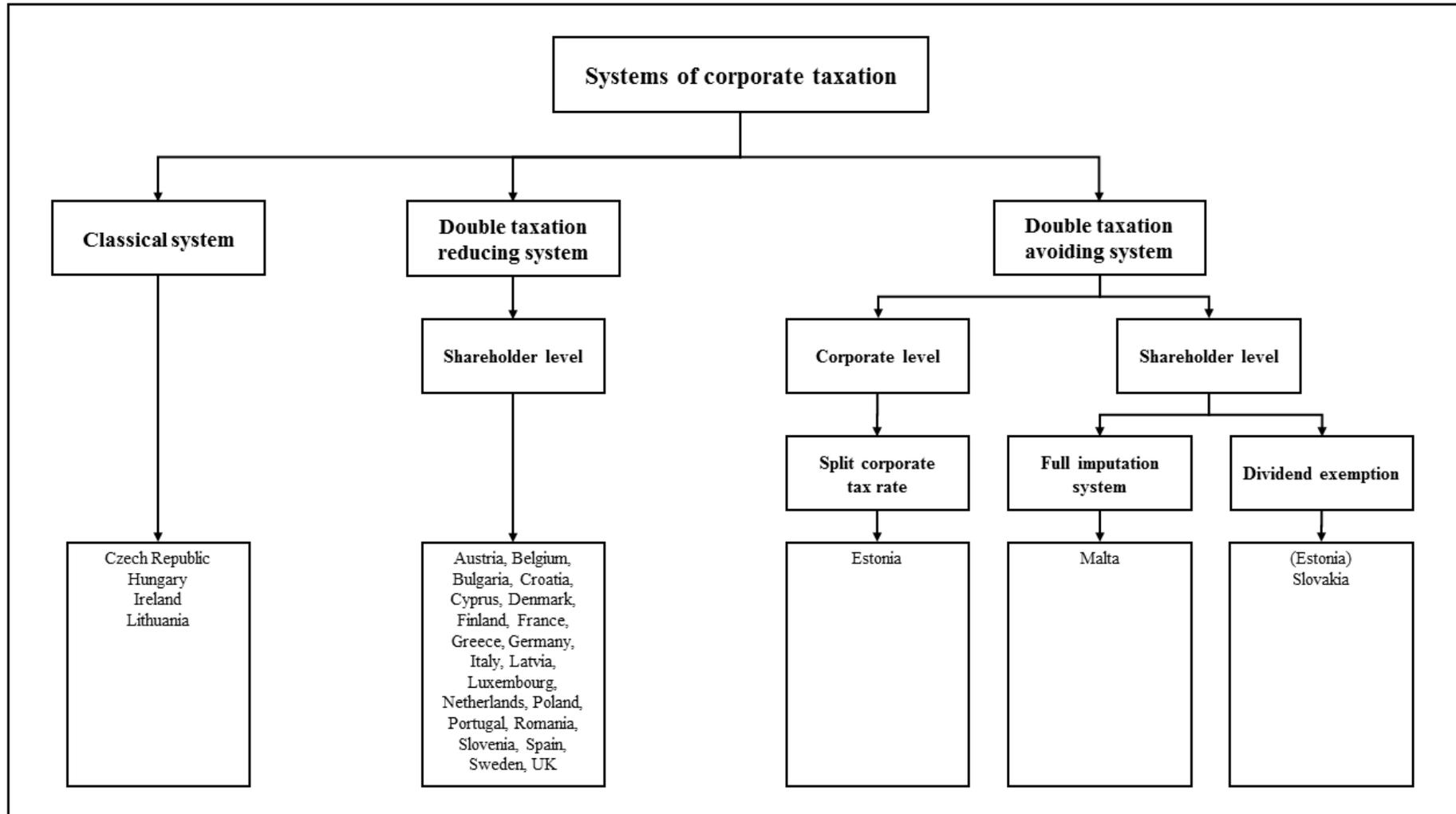
Country	PIT rate (in %)	CIT rate (in %)	Δ (in %-points)
Austria	50.00	43.75	6.25
Belgium	53.50	50.49	3.01
Bulgaria	15.00	14.50	0.50
Croatia	47.20	29.60	17.60
Cyprus	38.50	12.50	26.00
Czech Rep.	16.05	31.15	-15.10
Denmark	50.00	55.36	-5.36
Estonia	20.00	20.00	0.00
Finland	50.25	42.44	7.81
France	9.00	64.38	-15.38
Germany	47.79	48.59	-0.80
Greece	33.00	33.40	-0.40
Hungary	31.96	31.96	0.00
Ireland	40.00	57.13	-17.13
Italy	48.52	46.35	2.17
Latvia	23.00	23.50	-0.50
Lithuania	15.00	27.75	-12.75
Luxembourg	44.10	43.38	0.72
Malta	35.00	35.00	0.00
Netherlands	52.00	43.75	8.25
Poland	32.00	34.39	-2.39
Portugal	56.50	49.24	7.26
Romania	16.00	29.44	-13.44
Slovakia	25.00	22.00	0.00
Slovenia	50.00	37.75	12.25
Spain	45.00	44.92	0.08
Sweden	54.86	45.40	9.46
UK	45.00	44.45	0.55
Mean	38.72	37.95	0.77

Note: Data was retrieved from ibfd.org.

³³⁰ The allowances reduce the PIT base of the investors when shareholdings in eligible SMEs are acquired and thereby lower personal income tax payments.

³³¹ See Holtz-Eakin (1995) p. 393.

Figure 8: Systems of corporate taxation in the EU (2015)



Note: Data was retrieved from ibfd.org.

Even for investor-level incentives, the adequacy of tax incentives in compensating SMEs for corporate double taxation therefore appears questionable. Instead, a general reduction of taxes on dividends and capital gains emerges as the superior approach. It would reduce the disadvantages incurred by SMEs due to double taxation while avoiding the problems of explicit size restrictions. In practice, of course, the loss of tax revenues (compared to measures restricted to SMEs) is a major concern.³³² The concern could be alleviated by limiting reduced taxation to significant shareholdings, i.e., shareholdings accounting for a certain percentage of all outstanding shares of the respective company. Such a restriction would practically exclude shareholders of large enterprises while also achieving an improved focus on the shareholders who cannot avoid dividend and capital gains taxation because they make a living on the proceeds from their participations (mostly owner-managers of small firms). A differentiated treatment according to the holding quota is already implemented in several countries, which proves the practicability. In Germany, for example, a restriction of preferential treatment is easily achievable by increasing the part of exempt dividends and capital gains in the *Teileinkünfteverfahren* while holding everything else equal.³³³

4.2.4 Tax Planning Opportunities for Multinational Enterprises

Large enterprises usually run multi-national operations whereas SMEs mostly operate exclusively on the domestic market.³³⁴ Cross-border operations, of course, come along with tax advantages and usually offer opportunities for tax planning. The overall tax liability can be reduced significantly as income is shifted to low-tax jurisdictions, e.g., through transfer pricing, hybrid structures taking advantage of legal mismatches and tax haven finance affiliates.³³⁵ The exact amount of savings from such activities, of course, varies across countries and companies. Overall, anecdotal as well as empirical evidence indicate substantial reductions of tax payments, though, and the lack of opportunities for cross-border profit shifting could put SMEs at a structural competitive disadvantage that would not arise in the absence of taxation.³³⁶ Possibly, this warrants the use of SME tax incentives as a consolation.

³³² See Reister/Spengel/Finke/Heckemeyer (2009) p. 1.

³³³ In the *Teileinkünfteverfahren*, 60% of dividends and capital gains are taxed at the normal progressive PIT rates whereas the rest is exempt. For a more detailed description, see Section 6.2.

³³⁴ In fact, the vast majority of all SMEs in the European Union (in particular micro and small enterprises) do not feature any international business activities. See European Commission (2014) pp. 81 ff.

³³⁵ See Jacobs/Endres/Spengel (2015) pp. 885 ff.

³³⁶ See Huizinga/Laeven (2008) pp. 1164 ff.; Clausing (2009) pp. 703 ff.; Egger/Eggert/Winner (2010) pp. 99 ff.; Pinkernell (2013) pp. 180 ff.;

Whether effective tax rates really decrease in firm size, however, is questionable. Empirical evidence on the subject has been ambiguous so far.³³⁷ Moreover, smaller entities also have opportunities for tax planning that do not play a role for most large enterprises. Small businesses, for example, can often choose their legal form in a tax-optimal way.³³⁸ The limited number of shareholders of most micro and small enterprises also enables controlling owners to optimize profit distributions according to their personal needs and preferences. In addition, profits can be extracted with the help of contracts between the company and the owners (e.g., employment contracts and shareholder loans). These contracts oftentimes serve the purpose of saving taxes and do not necessarily reflect the real economic value of the services provided to the firm.³³⁹ Besides tax avoidance, small business owners also engage in tax evasion more than any other group of taxpayers. Especially self-employment is used as a vehicle for tax evasion.³⁴⁰ In the UK, for example, SMEs account for about half of the overall tax gap and the amount of evaded taxes relative to the overall amount of the estimated tax liability is nearly twice as high as for large enterprises (3.1% compared to 1.8%).³⁴¹

Altogether it is thus not clear, if and how much SMEs are really disadvantaged with regard to tax planning (and tax evasion) opportunities. Even if they were, this would not represent an adequate justification of SME tax incentives as they are currently implemented, though. As previously discussed, it is highly unlikely that compensating for one tax-induced distortion by introducing another distortion in the tax system leads to a higher degree of overall efficiency – especially if the extent and the dynamics of the initial distortion are not exactly known. Moreover, imposing lower tax burdens on more mobile capital may simply be efficient. So there may not even be a need for compensation. And lastly, a look at actual SME tax incentives shows that micro enterprises benefit by far the most whereas small and even more so medium-sized entities are often not affected by the regimes or only to a limited degree. It is predominantly micro enterprises, however, who can engage in the abovementioned tax planning and tax evasion strategies existing for narrowly held companies. Most of the currently

³³⁷ See Mills/Erickson/Maydew (1998) pp. 6 ff; Wilkinson/Cahan/Jones (2001) pp. 165 ff.; Gupta/Mills (2002) pp. 117; Richter/Samphantharak/Timmons (2009) pp. 898 ff.; Belz/von Hagen/Steffens (2016) pp. 2 ff.

³³⁸ See Gordon/MacKie-Mason (1994) pp. 279 ff.; MacKie-Mason/Gordon (1997) pp. 477 ff.; Goolsbee (1998) pp. 143 ff.; Goolsbee (2004) pp. 2283 ff.; Luna/Murray (2010) pp. 995 ff.; Liu (2014) pp. 387 ff.; Jacobs/Scheffler/ Spengel (2015) p. 6.

³³⁹ See Jacobs/Scheffler/Spengel (2015) pp. 569 ff.

³⁴⁰ See Pissarides/Weber (1989) pp. 17 ff.; Feldman/Slemrod (2007) pp. 327 ff.

³⁴¹ See HM Revenue & Customs (2015) p. 19. Data for the U.S. suggests small business owner to account for an even larger share of the tax gap. See Gale/Brown (2013) p. 881; IRS (2016) pp. 11 ff.

available tax incentives would thus be badly targeted if they were intended to compensate for an imbalance in tax planning opportunities.

4.2.5 *Compliance Costs*

Paying taxes does not only represent a burden for businesses due to the actual tax payments but also because determining the tax liability as well as paying the taxes cause considerable compliance costs. Previous studies have estimated compliance costs to amount to up to 21% of turnover³⁴² and 150% of taxable income for the very smallest businesses.³⁴³ The majority of studies, however, report significantly lower compliance burdens between 0.2% and 15% of revenues.³⁴⁴ Compliance costs are incurred for acquiring external expertise (e.g., tax advisers), for acquiring required materials and for hiring employees who take care of tax-related obligations.³⁴⁵ Importantly, a substantial share of the compliance burden is made up of fixed and quasi-fixed costs. Moreover, large enterprises benefit from economies of scale and learning effects stemming from the volume and the frequency of their operations and related tax obligations.³⁴⁶ As a consequence, the compliance burden (relative to turnover or total assets) decreases in firm size and micro and small enterprises are subject to a disproportionately high compliance burden.³⁴⁷ So the tax system indeed puts SMEs at a competitive disadvantage that would not exist in the absence of taxation.

But does this discrimination justify the use of SME tax incentives? In contrast to the abovementioned structural disadvantages, enhanced compliance costs are really driven by firm size (or rather the lack thereof). The amount of sales of an enterprise actually determines how well fixed costs can be forwarded to customers through prices so that firm size is not only a more or less accurate proxy of the firm characteristic which truly causes the disadvantage but the actual reason of the disadvantage.³⁴⁸ Tax incentives based on firm size are thus well targeted at the businesses being affected by the disproportionate compliance burden.

³⁴² See Colmar Brunton (2005) p. 99.

³⁴³ See DeLuca/Stilmar/Guyton/Lee/O'Hare (2007) p. 175.

³⁴⁴ For a comprehensive literature overview on the measurement of tax compliance costs, see Eichfelder (2010) pp. 55 ff.

³⁴⁵ See Eichfelder (2010) pp. 20 ff.

³⁴⁶ See Eichfelder (2010) p. 59 f.

³⁴⁷ See Sandford/Godwin/Hardwick (1989) pp. 197 ff.; Slemrod/Venkatesh (2002) pp. 40; DeLuca/Stilmar/Guyton/Lee/O'Hare (2007) pp. 174 ff.

³⁴⁸ See Eichfelder (2010) p. 217.

Among the different forms of relief, administrative simplifications should be the primary choice to address disproportionate compliance burdens. Requiring simplified tax accounts, less frequent tax returns and fewer tax payments – as it is common practice in most EU Member States – should actually decrease enterprises’ compliance costs. Administrative reliefs for micro and small businesses are thus effective and efficient instruments in alleviating the compliance-related distortion introduced by the tax system. In addition, simplified procedures also relieve the tax administration and are likely to increase net tax revenues. The use of administrative simplifications for very small businesses therefore appears well-grounded and is likely to contribute to the overall efficiency of the tax system.

Caution needs to be exercised with regard to the generosity and the exact eligibility thresholds, though. Preferential treatment for small businesses naturally partitions taxpayers and violates the neutrality of the tax system.³⁴⁹ The relief provided needs to be carefully weighed against the size-related disadvantage under the ordinary compliance obligations. Otherwise a discrimination against micro and small businesses easily turns into a discrimination against larger entities – either because eligibility thresholds are chosen too high or because the relief provided is too beneficial. In particular, regimes may be overly generous if they strongly deviate from standard procedures. If income is determined presumptively, for example, or if special regimes replace several taxes, the determination and collection of taxes is not only simplified but actual tax payments are significantly altered.³⁵⁰ Taxpayers are then put at a substantial competitive advantage compared to ineligible competitors and may be strongly incentivized to not forfeit access to the special regimes by remaining small (or by reporting to be small).³⁵¹ In addition, simplifications should be harmonized with non-tax regulations. Eligibility thresholds for simplified tax accounting, for example, need to consider financial accounting regulations. A simplified regime would be misplaced if local accounting standards required comprehensive double-entry and accruals-based book-keeping from the respective businesses anyway.

SME tax incentives other than administrative reliefs do not actually address the problem of disproportionate compliance costs but rather seek to provide compensation by a reduction of actual tax payments. The match of taxpayers being affected by excessive compliance

³⁴⁹ See Keen (2013) p. 27.

³⁵⁰ See Thuronyi (1996) pp. 406 ff.

³⁵¹ See Section 5.1 for a discussion of taxpayers’ bunching below eligibility thresholds for SME tax incentives (including special regimes altering the tax base significantly compared to standard income taxation).

burdens and taxpayers benefiting from the incentives is not as good as for administrative reliefs. Hence, the case for special tax rates, allowances or tax credits can only be made if micro and small companies experience compliance-related disadvantages which cannot be neutralized by administrative reliefs. Empirical evidence suggests that such disadvantages indeed exist as enhanced compliance costs were measured in tax systems actually offering simplified procedures.³⁵² If, as a consequence, input and output-based tax incentives are granted, the relief should mirror the incidence of compliance costs as accurately as possible. Following this rationale, adequate incentives need to benefit profitable as well as loss-making businesses – compliance costs accrue irrespective of taxable income – and they must also benefit large enterprises. Furthermore, compliance costs accrue for businesses of all legal forms. So the compensatory relief should be provided accordingly. Lastly, compliance costs are primarily caused by the act of running business operations, not by making distributions to shareholders, which speaks against shareholder-level measures.

The most adequate type of SME incentive to fit the abovementioned requirements is a refundable, generally applicable tax credit on the firm level with a capped calculation basis. Such a credit would benefit entities of all legal forms, irrespective of their profits and their specific characteristics. Moreover, the relief would mirror the regressive nature of compliance costs due to the cap on the calculation basis.³⁵³ It is questionable, though, what the calculation basis should be for such a tax credit. Each alternative would – at least to some degree – discriminate between firms of different sizes, industries and legal forms. Moreover, any tax credit would most likely cause additional compliance effort – especially for taxpayers who are subject to simplified accounting regulations. Obviously, this is the opposite of what is actually intended by the incentive.³⁵⁴ Altogether, it therefore appears that the disproportionality in compliance burdens is the lesser evil compared to the new distortions and administrative requirements that SME tax incentives induce – even if a tax credit in the described form is chosen.

³⁵² For a comprehensive overview of existing studies, see Eichfelder (2010) pp. 51 ff.

³⁵³ See European Commission (2015b) p. 151.

³⁵⁴ The amount of equity invested in an enterprise would probably be the most neutral calculation basis with regard to firm size and other firm characteristics. It is, of course, not directly related to compliance costs but offers the advantage of being reported in the ordinary process of determining taxable income. Basing a tax credit on equity would also have the positive side effect of alleviating the debt bias. On the other hand, the very smallest businesses do not necessarily submit a balance sheet and would thus not be able to benefit unless they forfeit the advantage of simplified accounting or at least incur additional compliance costs.

4.3 *Interim Conclusion*

Tax incentives for specific groups of taxpayers inherently contravene fundamental guiding principles of modern taxation such as equity, neutrality and simplicity. Nonetheless, SME tax incentives are commonly used instruments in European tax policy and the question of their justification arises. In general, non-tax and tax-related arguments need to be distinguished. Non-tax rationales are mainly based on market failure that leads to underinvestment in the small business sector and ultimately to a suboptimal level of social welfare. In particular, positive externalities (in the form of innovations or increased job creation) and asymmetric information (resulting in financing constraints) are discussed as motives for SME tax incentives. Theoretical as well as empirical evidence suggest that small businesses are indeed subject to these market failures. It is, however, not the SME sector per se but only a specific and rather small group of young, mostly innovative high-risk, high growth enterprises who have substantial problems in obtaining sufficient capital from traditional sources of finance and who generate positive externalities for the economy. These enterprises, the gazelles, are not adequately targeted by eligibility criteria merely based on firm size. In fact, it is highly questionable if gazelles can be targeted accurately *and* cost efficiently at all in the context of taxation. As a consequence, most SME tax incentives are highly inefficient countermeasures against SME-related market failures.

In addition, the effectiveness of SME tax incentives in helping young, rapidly growing businesses to overcome market failure is doubtful. The vast majority of currently available regimes are designed in ways that neglect the needs of targeted firms. Gazelles tend to incur losses in the early stages of their lifecycle. They can often not benefit from special tax rates and non-refundable input-based incentives as they do not have any profits effectively being taxed. Instead, most SME tax incentives in the European Union primarily provide relief for well-established enterprises with stable, positive income. Given the limited potential for growth and innovation that these businesses possess as well as the evolution of the banking sector which has increasingly adapted to small-business lending, the majority of current SME tax incentives are unnecessary and ineffective in addressing market failures.

Proponents of SME tax incentives also point to structural, size-related disadvantages emanating from the tax system for small and medium-sized businesses as a justification of SME tax incentives. Most importantly, the restriction of loss offsets, the preferential treatment of debt and the double taxation of corporate profits are assumed to handicap small businesses.

Empirical studies indeed show SMEs to be more likely to incur losses, to be less reliant on debt financing and to be more concerned about shareholder taxation. So current tax systems actually tend to put SMEs at a competitive disadvantage. Once again, however, tax incentives are an inadequate remedy. Neither do they remove the underlying problems nor do they target the affected businesses accurately. In fact, the opposite is true as the primary beneficiaries of the incentives, i.e., businesses with stable positive incomes, should also be the ones who are affected the least by the aforementioned discriminations. These well-established firms usually do not have problems to acquire debt or to effectively deduct interest payments and loss carryovers.

These observations clearly show that the adequacy of tax incentives as a remedy for structural disadvantages of the SME sector hinges on their ability to alleviate the underlying frictions or at least to accurately target the affected businesses. As was demonstrated, SME tax incentives do not fulfill either requirement for most market failures and tax-induced handicaps. There are, however, a few instances where preferential tax treatment for small businesses may be warranted. Most notably, administrative reliefs are an adequate measure to avoid disproportionate tax compliance burdens. With regard to compliance costs, small businesses are inherently disadvantaged compared to larger entities due to the high share of fixed and quasi-fixed cost components that do not grow proportionally in firm size. Administrative reliefs for small businesses (e.g., less frequent filings and simplified accounting requirements) effectively reduce these costs and accurately target the overly burdened taxpayers. In this case, size-based tax incentives are a sensible countermeasure as firm size is the actual characteristic causing the disadvantage. The incentives should not be too generous, though, and avoid significant alterations of the actual tax liability (e.g., due to presumptive methods of determining taxable income or overly generous VAT exemptions) because a disadvantage for small businesses could otherwise turn into an unfair advantage. Besides administrative simplifications, the targeting of SMEs may also be a useful instrument in the context of R&D incentives. For these regimes, the cost efficiency could be improved if the R&D activities of small entities show a higher responsiveness to tax reliefs. In addition, investments in and by venture capital funds and companies – who naturally operate in the SME sector – could be adequate targets of tax benefits as the usual problem of targeting the right SMEs is less prevalent there.

Summing up, most of the commonly used justifications for SME tax incentives are not well-founded. Especially worrisome is the regular misperception that small businesses per

se are dynamic, innovative and the sole creators of jobs. In contrast to this view, the businesses of the SME sector are actually very diverse and mere firm size should not be mistaken as a proxy for other firm characteristics. The vast majority of SMEs do not grow fast and do not show above-average innovativeness. Nonetheless, beneficial tax treatment targeted at small and medium-sized enterprises can be an adequate measure for certain purposes. Even when used for these purposes, however, the design of many currently available regimes is inadequate and renders the respective regimes inefficient (if not even ineffective).

5. Costs and Adverse Effects of SME Tax Incentives

5.1 *Taxpayer Bunching Around Eligibility Thresholds for SME Tax Incentives*

5.1.1 *Introduction*

The adequacy of tax incentives hinges on their effectiveness in achieving the intended policy goals as well as the costs related to their usage. As is shown in Section 4, the effectiveness of currently available SME tax incentives is limited with regard to most of the problems associated with the SME sector. Question marks, however, are not limited to the effectiveness of SME tax reliefs but extend to possibly excessive costs. Losses in tax revenue, increased compliance and collection efforts as well as welfare losses due to distortions of investment decisions and capital allocation are the most important caveats emanating from selective preferential tax treatment.³⁵⁵

The amount of costs entailed by tax incentives depends on the specific design of the regimes. In this regard, policy-makers' tendency to use eligibility criteria explicitly referring to firm size (and thereby partitioning taxpayers) for SME tax incentives deserves particular scrutiny. Around the respective size thresholds, taxpayers are discouraged from growth as they forfeit preferential treatment by outgrowing the size limit. Obviously, such "taxation walls"³⁵⁶ are antithetical to the actual goals of SME tax incentives. If thresholds refer to turnover or income, they may induce taxpayers to curb sales. In the case of asset thresholds, necessary investments may be prevented while employment thresholds can impede the hiring of additional personnel. Even restrictions on the number of shareholders or the amount of capital can be harmful as the acquisition of required funds is potentially undermined.

Prior literature has provided extensive evidence of taxpayers bunching below size-related thresholds. Generally, the bunching literature distinguishes between two kinds of thresholds: kinks and notches. Kinks are discrete changes in the *slope* of choice sets, i.e., points where the marginal treatment of target variables changes as soon as a given threshold is exceeded. In taxation, such points occur within progressive tax rate schedules or at caps of input-based incentives.³⁵⁷ Saez (2010), Chetty et al. (2011, 2013) and Le Maire and Schjern-

³⁵⁵ See Blinder/Rosen (1985) p. 744.

³⁵⁶ See Chen/Mintz (2011) p. 2.

³⁵⁷ Progressive tax schedules induce kink points at the thresholds where the marginal tax rate jumps and income beyond the threshold is taxed at a higher rate. Progressive schedules, however, can also result in notches, if pref-

ing (2013), for example, find significant bunching at kinks in the Danish and the US personal income tax schedules while Devereux et al. (2014) provide similar evidence for UK corporations.³⁵⁸

Notches, on the other hand, are discrete changes in the *level* of choice sets. In the context of taxation, notches occur when some kind of preferential treatment is only granted for taxpayers not exceeding a certain level of a given parameter (e.g., taxable income). As soon as taxpayers pass the critical level, they are completely excluded from the benefits at stake. For special tax rates, tax credits or tax allowances, this leads to a discontinuity of the average tax rate. In the case of administrative reliefs (e.g., simplified accounting or disclosure requirements), notches induce discontinuities in the compliance cost burden.³⁵⁹ Recent empirical evidence of bunching at notches in the tax system includes studies from Kleven and Waseem (2013), who examine multiple tax rate jumps in the Pakistani PIT schedule, as well as from Almunia and Lopez-Rodriguez (2016) and Asatryan and Peichl (2016), who focus on administrative reliefs in the Spanish and Armenian tax systems, respectively.³⁶⁰

The magnitude of taxpayers' bunching responses depends in large part on the size of the benefit that is gained through bunching.³⁶¹ In this regard, notches naturally provide a stronger incentive to bunch than kinks as taxpayers around thresholds run the risk of com-

erential rates are only provided as long as taxpayers remain under the income threshold or fulfil other size-related criteria. See Kleven/Waseem (2013) pp. 669 ff.; Kleven (2016) p. 436 ff.

³⁵⁸ See Saez (2010) pp. 180 ff.; Chetty/Friedman/Olsen/Pistaferri (2011) pp. 749 ff.; Chetty/Friedman/Saez (2013) pp. 2683 ff.; Devereux/Liu/Loretz (2014) pp. 19 ff.; Le Maire/Schjering (2013) pp. 1 ff. Building on the methodology developed by these studies, several other studies provide further evidence of bunching at kink points in personal income tax schedules, the corporate income tax schedules, alternative minimum tax schedules, inheritance tax schedules and wealth tax schedules. See Kleven/Knudsen/Kreiner/Pedersen/Saez (2011) pp. 651 ff.; Bastani/ Selin (2014) pp. 36 ff.; Brockmeyer (2014) pp. 477 ff.; Gelber/Jones/Sacks; Seim (2014) pp. 1 ff.; Best/Brockmeyer/Kleven/Spinnewijn/Waseem (2015) pp. 1311 ff.; Fack/Landais (2016) pp. 23 ff.; Glogowsky (2016) pp. 1 ff.; Harju/Mattika (2016) pp. 640 ff.; Mortenson/Whitten (2016) pp. 1 ff.

³⁵⁹ See Slemrod (2013) pp. 259 ff.; Kleven (2016) pp. 436.

³⁶⁰ See Kleven/Waseem (2013) pp. 669 ff.; Almunia/Lopez-Rodriguez (2016) pp. 1 ff.; Asatryan/Peichl (2016) pp. 1 ff. Bunching at notches is also documented in the context of value-added taxation and property transfer taxation as well as at several other notches in PIT and CIT schedules around the world. Moreover, individuals and firms have been found to bunch at notches in interest rate schedules and labor regulations. See Schivardi/Torrini (2004) pp. 1 ff.; Onji (2009) pp. 766 ff.; Marx (2012) pp. 1 ff.; Sallee/Slemrod (2012) pp. 981 ff.; Ramnath (2013) pp. 77 ff.; Gourio/Roys (2014) pp. 377 ff.; Kleven/Landais/Saez/Schultz (2014) pp. 333 ff.; Best/Cloyne/Ilzetzki/ Kleven (2015) pp. 1 ff.; Liu/Lockwood (2015) pp.1 ff.; Best/Kleven (2016) pp. 1 ff.; Gari-cano/Lelarge/Van Reenen (2016) pp. 3439 ff.; Mosberger (2016) pp. 1 ff.

³⁶¹ See Chetty/Friedman/Olsen/Pistaferri (2011) pp. 749 ff.; Brockmeyer (2014) pp. 477 ff. In addition, taxpayers' awareness of the respective thresholds and cognitive effects have also been found to influence the amount of bunching at kinks and notches. Bunching is stronger, for example, as decision-makers become more familiar with the benefits of staying below kinks and notches or if they perceive the thresholds to be especially round numbers. See Saez (2010) pp. 180 ff.; Chetty/Friedman/Saez (2013) pp. 2683 ff.; Chetty/Saez (2013) pp. 1 ff.

pletely forfeiting potential benefits.³⁶² Accordingly, existing studies generally find stronger and sharper bunching at notches than at kinks.³⁶³ Given policy-makers propensity to apply eligibility criteria explicitly referring to size thresholds, substantial bunching by taxpayers thus seems probable for most of the currently available SME tax incentives in the European Union.³⁶⁴

Besides the generosity of the relief at stake, the amount of bunching also depends on the adjustment costs and frictions preventing taxpayers from managing their reported size parameters.³⁶⁵ It is, for example, well-documented that wage earners are less prone to bunching than self-employed and corporate taxpayers because wage earners are usually bound to employment contracts fixing the number of work hours and salaries. In order to adjust income, they must change jobs or renegotiate contracts, which is generally difficult to do – at least in the short run.³⁶⁶ Business owners and managers, in contrast, are more flexible. They can freely determine how much to work, how much to sell and which prices to demand from customers. Moreover, they often have leeway how and when to incur tax-relevant sales and expenditures.³⁶⁷ Given that there is often no third party directly reporting their income, they also have more opportunities to bluntly misreport income, i.e., to not declare the revenues they have accrued. Wage earners, in contrast, have their gross income reported by employers. Consequently, their ability to manipulate taxable proceeds is limited.³⁶⁸ Prior literature therefore concludes that the stark contrast in the extent of observed bunching between wage earners and self-employed taxpayers is largely attributable to the difference in enforcement intensity.³⁶⁹

Altogether, prior evidence suggests that SME tax incentives entail significant bunching responses at the respective eligibility thresholds. The existing body of literature, however, rarely relates specifically to the SME regimes described in Section 3 and the size criteria pro-

³⁶² In the interval around the notch, taxpayers incur a very high marginal tax rate on the portion of income or turnover that pushes them beyond the threshold. Any effort to acquire this portion of income or turnover is therefore strongly discouraged – or encouraged to be disguised. See Blinder/Rosen (1985) p. 736.

³⁶³ For a comprehensive overview on existing studies, see Kleven (2016) pp. 435 ff.

³⁶⁴ In 2015, 65 out of 73 regimes providing tax relief specifically targeted at SMEs included explicit size restrictions. These numbers do not include progressive personal tax rates, administrative reliefs and incentives targeted at venture capital funds and companies. See Section 3.1.

³⁶⁵ See Blinder/Rosen (1985) pp. 736 ff.; Chetty (2012) pp. 969 ff.; Devereux/Liu/Loretz (2014) pp. 19 ff.

³⁶⁶ See Chetty/Friedman/Olsen/Pistaferri (2011) pp. 762 ff.; Mortensen/Whitten (2016) pp. 26 ff.

³⁶⁷ See Kleven/Waseem (2013) pp. 693 ff.; Bastani/Selin (2014) pp. 43 ff.

³⁶⁸ Certain allowances may be used to manage income by wage earners as well, though. See Mortensen/Whitten (2016) pp. 26 ff.

³⁶⁹ See Liu/Lockwood (2015) pp.1 ff.; Almunia/Lopez-Rodriguez (2016) pp. 1 ff.

posed by the European Commission to target the SME sector (i.e., turnover, the number of employees and total assets). It does therefore not yet allow a comprehensive evaluation of the damage emanating from the notches created by currently available SME reliefs.

The following analysis addresses this research gap and provides bunching evidence for six EU Member States (Belgium, Hungary, Latvia, Lithuania, Romania and Spain). In these Member States, eligibility for major tax benefits is bound to explicit size thresholds referring to turnover and the number of employees. As is shown, bunching does indeed occur at a statistically significant level in the majority of the sample countries when these two indicators are used in the design of SME tax incentives. Among the examined regimes, the case of the Latvian micro enterprise scheme appears particularly interesting. It includes an employment threshold at which more than 6% of all firms in the considered business population bunch. In order to gain a better understanding of this phenomenon and the economic implications, the cross-country comparison is complemented by an in-depth analysis of the Latvian micro enterprise regime. Above all, it is highly relevant for policy-makers if taxpayers show real economic responses, i.e., if they really remain small, or if they only underreport firm size. The evidence at hand suggests that real economic responses indeed occur for employment thresholds, which points to the particular dangers of such restrictions.

The analysis proceeds as follows. Section 5.1.2 comprises the cross-country comparison of bunching responses at size thresholds in tax codes. First, the data is presented (5.1.2.1) and the institutional background described (5.1.2.2). Section 5.1.2.3 then introduces the methodological approach of the bunching analysis and displays the main results. Building hereon, Section 5.1.3 examines the Latvian micro enterprise scheme in more detail. After describing the specifics of the regime (5.1.3.1) and the time trend of bunching responses prior and subsequent to the introduction of the scheme (5.1.3.2), Section 5.1.3.3 addresses the roles of administrative reliefs and actual tax savings that are offered for eligible taxpayers. In the final part of the empirical analysis, the economic implications with regard to the impediment of firm growth induced by the micro enterprise scheme are examined (5.1.3.4). Lastly, Section 5.1.4 concludes.

5.1.2 *Cross-Country Comparison*

5.1.2.1 *Data*

The proper assessment of firms' bunching behavior requires data that is representative of the size distribution of businesses or – if feasible – covers the whole business population. Recent empirical literature regularly resorts to administrative data provided by tax authorities.³⁷⁰ These samples not only provide a comprehensive coverage of taxpayers of all size classes but also ensure high quality data on a wide range of financial indicators. Rich administrative data are rarely accessible, though. The analysis at hand therefore resorts to the AMADEUS database by Bureau van Dijk. The AMADEUS data provide financial information on a broad range of businesses in the European Union. Importantly, the information is available over multiple years, which allows the observation of growth patterns and taxpayers' changes in behavior as thresholds and regimes change.³⁷¹ Imprecisions due to differences between financial and tax accounting can be assumed to be negligible as far as turnover and employment, the two indicators of interest, are concerned. Both measures usually only deviate insignificantly for the two accounting regimes.³⁷²

5.1.2.2 *Size Thresholds*

The following cross-country comparison focuses on six EU Member States that provide substantial tax benefits up to certain size thresholds, namely Belgium, Hungary, Latvia, Lithuania, Romania and Spain. The sample includes administrative (simplified regimes, VAT exemptions) as well as non-administrative regimes (i.e., special tax rates, exemptions, allowances and tax credits). The considered regimes predominantly relate to corporate entities, which are covered more comprehensively by the AMADEUS database. Moreover, the sample of examined thresholds includes regimes using turnover and employment as eligibility criteria. The analysis thereby addresses an area that has been explored rather sparsely by previous bunching studies. The European Commission also proposes these two indicators to target SME incentives.³⁷³ They can thus be assumed to constitute a major reference point for policy-

³⁷⁰ See Kleven (2016) p. 436.

³⁷¹ See Table A3 for the main summary statistics of the relevant countries and indicators referred to in the following analysis.

³⁷² For more information on the differences between tax accounting and financial accounting, see Evers/Meier/Nicolay (2016) pp. 1 ff.

³⁷³ See European Commission (2003) pp. 36 ff.

makers in Europe which makes understanding the associated behavioral responses especially important.³⁷⁴

Table 22: Explicit size thresholds for SME tax incentives relating to turnover and employment (2014)

Country	Threshold(s)	Available SME incentives	Additional eligibility criteria
Belgium	<ul style="list-style-type: none"> turnover: € 7.3m employees: 50 	<ul style="list-style-type: none"> enhanced notional interest deduction (0.5%) investment allowance on investments in safety measures (20.5%) exemption from capital gains tax on gains from shares of other companies (0.412%) full-year depreciation in year of acquisition & immediate expensing of additional costs related to acquisition shareholder-level reliefs <ul style="list-style-type: none"> – possibility to create liquidation reserve that is subject to reduced PIT rate upon liquidation (10% instead of 25%) exemption of dividends from fairness tax that are made in spite of losses 	<ul style="list-style-type: none"> total assets ≤ € 3.65m (must not be fulfilled; replace either turnover or income criterion if fulfilled) taxable income ≤ € 322,500
Hungary	<ul style="list-style-type: none"> turnover: HUF 6m (~€ 20,000) 	<ul style="list-style-type: none"> presumptive taxation (lump-sum payment per employee) replaces CIT, social security tax, health care charge and vocational training contribution exemption from value-added tax 	<ul style="list-style-type: none"> legal form restrictions
	<ul style="list-style-type: none"> turnover: HUF 30m (~€ 100,000) 	<ul style="list-style-type: none"> flat rate tax (37%) on turnover replaces CIT, PIT, VAT and company car tax 	<ul style="list-style-type: none"> individual shareholders no excise duties
	<ul style="list-style-type: none"> turnover: HUF 500m (~€ 1.6m) employees: 25 	<ul style="list-style-type: none"> flat rate tax (16%) on income replaces CIT, social security tax and vocational training contribution 	<ul style="list-style-type: none"> total assets: HUF 500m (~€ 1.6m) enforceable tax debt ≤ HUF 1 million
Latvia	<ul style="list-style-type: none"> turnover: € 50,000 	<ul style="list-style-type: none"> VAT exemption 	
	<ul style="list-style-type: none"> turnover: € 100,000 employees: 5 	<ul style="list-style-type: none"> flat rate tax (9%) on turnover replaces CIT and social security contributions (thresholds: € 100,000 & 5 employees) exceeding thresholds leads to ineligibility in following year and increased tax rates on turnover in current year (2% per employee; 20% instead of 9% on turnover exceeding € 100,000) 	<ul style="list-style-type: none"> only individual and managing shareholders max. income of employees: € 720 per month

³⁷⁴ The qualitative analysis in Section 3.1 confirms that turnover, the number of employees and total assets are criteria regularly used to target SME tax incentives at the respective firms.

Country	Threshold(s)	Available SME incentives	Additional eligibility criteria
Lithuania	<ul style="list-style-type: none"> employees: 9 	<ul style="list-style-type: none"> preferential tax rate on income (5% instead of 15%) free depreciation (except for buildings) 	<ul style="list-style-type: none"> taxable income \leq € 150,000 (depreciation) / € 300,000 (tax rate) owners with other businesses must not own more than 50% of company
Romania	<ul style="list-style-type: none"> turnover: RON 220,000 (~€ 50,000) 	<ul style="list-style-type: none"> exemption from VAT 	
	<ul style="list-style-type: none"> turnover: € 65,000 	<ul style="list-style-type: none"> flat rate tax (3%) on turnover replaces ordinary CIT (mandatory) 	<ul style="list-style-type: none"> only privately owned companies exclusion of certain sectors (financial, consultancy)
Spain	<ul style="list-style-type: none"> turnover: € 1m 	<ul style="list-style-type: none"> exemption from local business tax (IAE) 	
	<ul style="list-style-type: none"> turnover: € 5m employees: 25 	<ul style="list-style-type: none"> preferential CIT rate (instead of 30%) <ul style="list-style-type: none"> – 20% on first € 300,000 of income – 25% on income beyond € 300,000 	<ul style="list-style-type: none"> no decrease in total employment since 2009
	<ul style="list-style-type: none"> turnover: € 10m 	<ul style="list-style-type: none"> preferential CIT rate (instead of 30%) <ul style="list-style-type: none"> – 25% on first € 300,000 of income 	

Table 22³⁷⁵ provides an overview of the considered size thresholds and the associated tax benefits. Each of the thresholds represents a notch in the tax system, i.e., eligibility for the underlying incentives is forfeited as soon as the respective threshold is exceeded. Hence, crossing the thresholds leads to a jump in the average tax rate or a jump in the compliance cost burden in the case of administrative reliefs. In Belgium, Lithuania and Spain, the thresholds restrict eligibility for various depreciation schemes, allowances, tax credits and special tax rates. In Hungary, Latvia and Romania, administrative reliefs such as exemptions from the VAT and the access to simplified regimes of income taxation (mostly turnover taxes) are considered. Interestingly, the simplified regimes in Hungary and Latvia not only replace the ordinary income tax but also include other duties such as social security contributions and the VAT. Turnover thresholds in the sample range from € 50,000 to € 10 million while employ-

³⁷⁵ Information on the specific regimes were retrieved from ibfd.org (retrieved on July 10, 2014).

ment thresholds from 5 to 50 employees are covered.³⁷⁶ The thresholds for administrative reliefs and simplified regimes are generally lower than those for non-administrative reliefs. It is also noteworthy that several of the thresholds apply to various regimes, i.e., eligibility to more than one relief is forfeited once a business exceeds the respective limits (e.g., in Belgium, Hungary and Spain).

5.1.2.3 *Bunching Estimates*

A first graphical inspection of the size distributions shows that the amount of bunching around the thresholds varies significantly (see Table 23). While some thresholds cause substantial bunching, other density functions do not show major irregularities. Especially noticeable jumps in the frequency of businesses occur at notches created by two of the simplified regimes in Hungary (if turnover is below HUF 6 million and HUF 30 million, respectively), by both administrative reliefs in Latvia (VAT exemption and simplified income tax regime) and by the exemption from the local business tax (IAE) in Spain.

Building on the graphical evidence, the analysis proceeds by estimating the size of firms' responses to tax notches in the six sample countries, i.e., the number of firms that shift to the size intervals just below the considered thresholds. In the absence of size-based incentives, firms would locate themselves smoothly along the size distribution measured in terms of turnover, total assets and the number of employees. The introduction of tax benefits exclusively available up to a certain firm size, however, provides businesses beyond the critical firm size with an incentive to be smaller in order to gain eligibility. As a consequence, firms in the vicinity of the eligibility threshold should decide to become smaller if the gains emanating from eligibility exceed the costs of being smaller – or at least the costs of reporting to be smaller.

Following the approach developed by Saez (2010), Chetty et al. (2011) and Kleven and Waseem (2013), the number of firms shifting from the right side of the notch to the left is measured by grouping firms into turnover bins, estimating the counterfactual density (i.e., the size distribution as it would have looked in the absence of the notch) and comparing the coun-

³⁷⁶ Incentives for medium-sized entities are not considered. As is shown in Section 3.2, these regimes do not provide much of a relief to the majority of taxpayers and the number of businesses in these size intervals is too small to observe bunching behavior.

terfactual to the actual density function.³⁷⁷ Technically, the counterfactual density is derived by fitting a flexible polynomial function to the observed distribution except for the area below the notch $[t_L; t_N]$ where taxpayers are expected to bunch. The bunching area is determined by means of visual inspection. For most thresholds, it contains several bins as taxpayers are often unable to bunch precisely below the threshold (due to adjustment frictions). All bunchers are assumed to come from the right-hand side of the threshold in the displayed area of the counterfactual distribution. The variable of interest, the excess mass \hat{b}_i , is derived by comparing the actual number of firms c_i to the counterfactual number \hat{c}_i in the interval $[t_L; t_N]$ below the notch:

$$\hat{b} = \frac{\sum_{i=t_L}^{t_N} (c_i - \hat{c}_i)}{\sum_{i=t_L}^{t_N} (\hat{c}_i / N)}$$

where N is the number of bins within the bunching interval $[t_L; t_N]$. \hat{b} describes the number of firms being lured to the bunching interval relative to the expected number of firms per bin in the bunching area. The relative measure allows a comparison of firms' excess masses across different regimes.

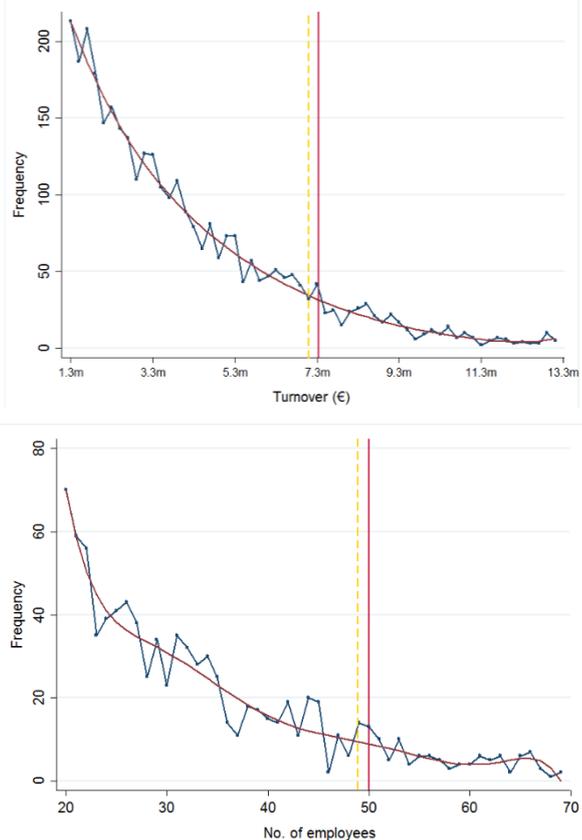
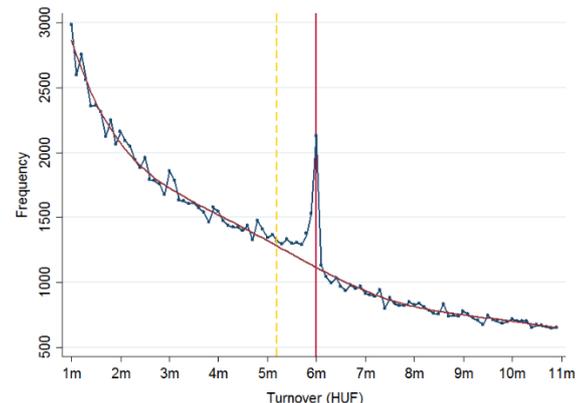
Table 23 shows the estimated density functions and counterfactuals for the sample thresholds. Bunching intervals are marked by dashed golden (t_L) and solid red lines (t_N). The excess mass of bunching firms equals the area in between the actual and the counterfactual distributions in the bunching interval. First of all, the graphs reveal a few methodological issues. To begin with, the derivation of the counterfactual assumes a smooth size distribution and can be distorted by irregularities other than the thresholds in question. When determining the area for estimating the counterfactual, intervals including thresholds for other size-related policies are therefore avoided if possible. In some instances, however, such overlaps are inevitable because the number of bins and observations would not suffice to derive smooth counterfactuals if all other irregularities were excluded.³⁷⁸ Another issue occurs with regard to the distinction of real (intended) bunching and coincidental peaks in size distributions. Given the limited number of observations, some density functions are quite unsteady, which aggravates the identification of actual bunching behavior. Methodologically, this implies a trade-off when determining the width of the considered bins: If the bins are chosen too narrow, the dis-

³⁷⁷ Employment and asset thresholds are dealt with accordingly. See Saez (2010) pp. 180 ff.; Chetty/Olsen/Pistaferri (2011) pp. 749 ff.; Kleven/Waseem (2013) pp. 669 ff.

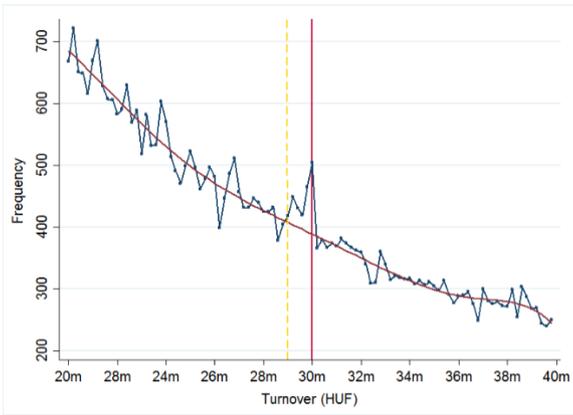
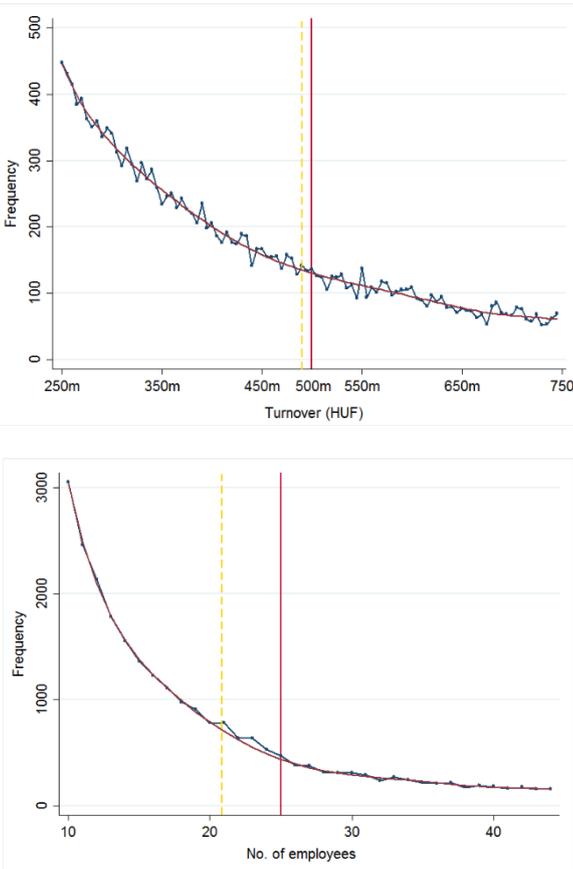
³⁷⁸ Most notably, there is an administrative notch in Spain at the turnover threshold of € 6 million where taxpayers become subject to the large taxpayer unit. See Almunia/Lopez-Rodriguez (2016) pp. 1 ff.

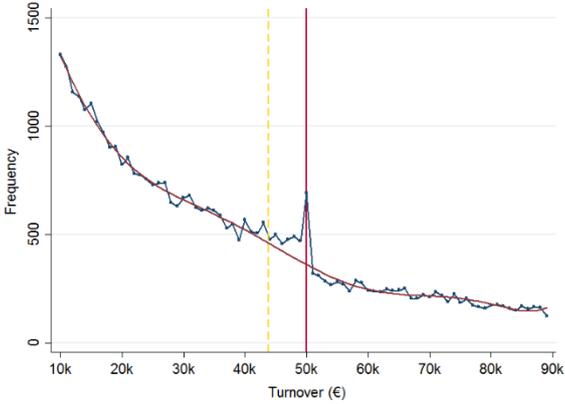
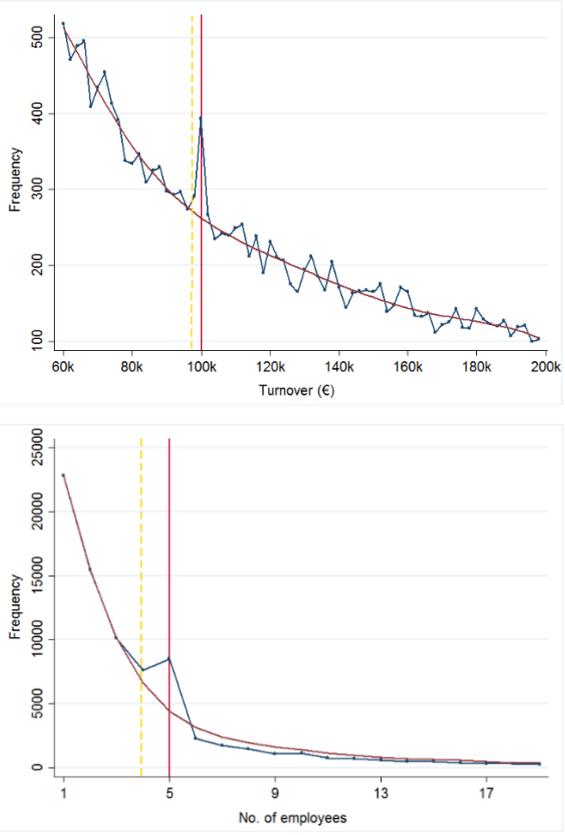
tribution is not smooth enough, while too broad bins bear the risk of concealing the bunching behavior at the notches.³⁷⁹

Table 23: Density functions and counterfactuals

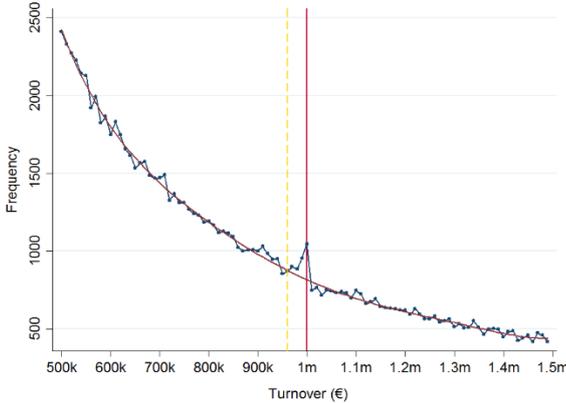
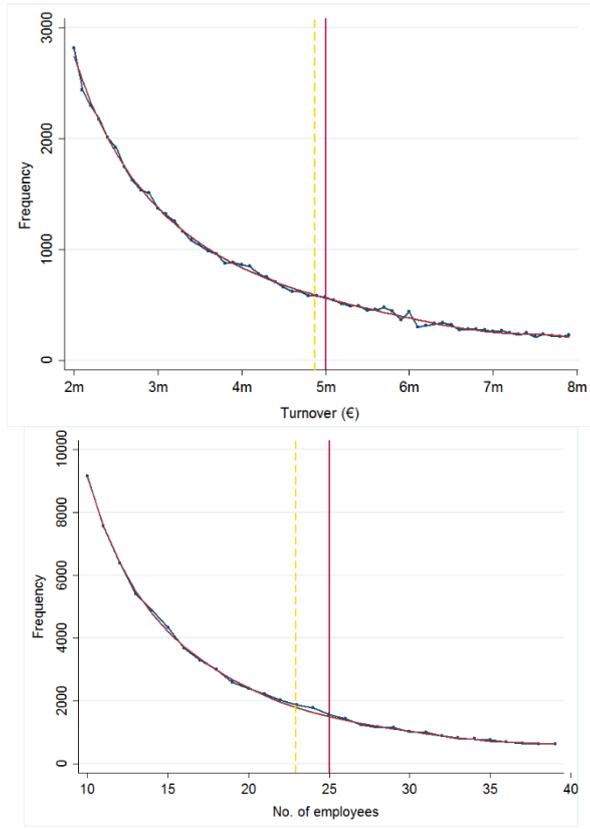
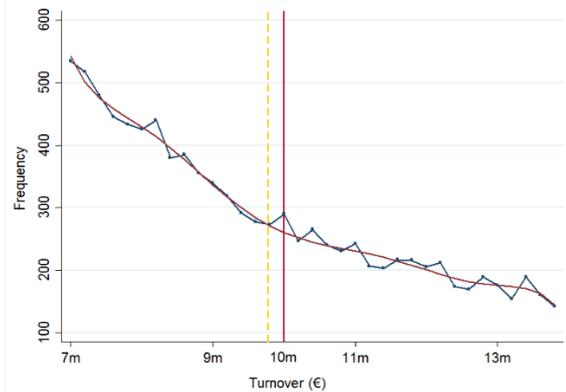
Country	Threshold(s)	Size distribution
Belgium	turnover: € 7.3m employees: 50	
Hungary	turnover: HUF 6m (~€ 20,000)	

³⁷⁹ The problem mainly occurs for turnover thresholds. Employment distributions, in contrast, tend to be very smooth so that even small upticks in the bunching window can be observed (e.g., in Hungary and Spain).

Country	Threshold(s)	Size distribution
Hungary (ctd.)	turnover: HUF 30m (~€ 100.000)	
	turnover: HUF 500m (~€ 1.6m) employees: 25	

Country	Threshold(s)	Size distribution
Latvia	turnover: € 50,000	
	turnover: € 100,000 employees: 5	

Country	Threshold(s)	Size distribution
Lithuania	employees: 9	
Romania	turnover: RON 220,000 (~€ 50,000)	
	turnover: € 65,000	

Country	Threshold(s)	Size distribution
Spain	turnover: € 1m	
	turnover: € 5m employees: 25	
	turnover: € 10m	

The estimates of the excess mass \hat{b} and bootstrapped standard errors (200 iterations) are summarized in Table 24. The standard errors allow inferences on the statistical significance of the irregularities around the notches. Overall, the quantitative results as well as the graphical evidence provided by the density functions and the counterfactuals confirm that businesses do not only manage taxable income but also turnover and the number of employees if this is required to gain eligibility for substantial tax reliefs. Neither turnover nor employment is immune to bunching activities. With regard to the whole sample of 16 thresholds, bunching occurs at a statistically significant level of at least 10% (5%) at 10 (6) of them. Bunching occurs at turnover thresholds in Hungary, Latvia, Romania and Spain and at employment thresholds in Hungary, Latvia and Lithuania. Most notably, 6.1% of the active Latvian businesses covered in the AMADEUS database are estimated to bunch at the employment threshold (5 employees). Taken at face value, this means that one out of 16 firms is induced to employ fewer employees than they would in the absence of the Latvian micro enterprise scheme. In contrast to that, no bunching can be observed in Belgium and for two of the three incentives in Spain.

Based on the observed excess mass \hat{b} , the most distinct bunching across the considered countries occurs for notches which imply very far-reaching consequences for taxpayers. At these thresholds, it is not only eligibility for a certain tax credit or a special tax rate that is at stake but the whole assessment process that is about to change. In Hungary, Latvia and Romania³⁸⁰, for example, businesses switch from a turnover tax replacing several duties (including the corporate income tax as well as social security contributions for employees) to the standard system requiring separate payments and separate assessments. When regimes “merely” provide tax cuts within the ordinary corporate income tax system, however, turnover and employment bunching is very limited or even inexistent.

The incentives inducing strong bunching responses by taxpayers also have in common that they relate exclusively to micro businesses, mostly the very smallest ones with less than € 100,000 of turnover. At thresholds applying to small enterprises, in contrast, no or only weak bunching is observable (e.g., in Belgium and Spain).

³⁸⁰ In Hungary three different simplified regimes apply. For each of them, bunching occurs at the respective eligibility thresholds. In Latvia, taxpayers bunch at the VAT registration threshold as well as at the threshold up to which the simplified CIT regime for microenterprises applies.

Altogether, these findings are in line with prior literature that reports bunching for other indicators than taxable income to be rather limited if the notch does not come along with significant administrative reliefs. Almunia and Lopez-Rodriguez (2016), for example, find bunching at the turnover threshold where taxpayers become subject to stricter audits but they do not discover significant bunching at non-administrative notches.³⁸¹ Other studies providing evidence of turnover or employment bunching also relate to administrative notches such as VAT exemption thresholds³⁸² and thresholds associated with stricter labor regulation³⁸³. Studies observing taxable income, on the other hand, find significant bunching even for incentives providing less generous reliefs than the above described regimes in Belgium and Spain.³⁸⁴ This clearly indicates that taxable income is more responsive to quantitative eligibility criteria because it is easier to adjust, mostly through the increase of deductible expenses.³⁸⁵

Still, substantial bunching is observable for several thresholds relating to turnover and employment. At these thresholds, it is either easier for taxpayers to manage turnover and employment or the regimes are extremely beneficial for taxpayers and induce them to make the efforts required to remain below the threshold. The former explanation is supported by the observation that it is predominantly very small businesses who bunch in the sample at hand. These firms are usually subject to less scrutiny from tax authorities than large companies. As a consequence, they may be more prone to misreporting.³⁸⁶ In addition – or as an alternative explanation – the simplified regimes and exemptions could be particularly beneficial as they enable substantial savings in compliance costs as well as substantial tax savings. The turnover taxes in Hungary and Latvia, for example, replace not only the corporate income tax but also social security contributions and, in the case of Hungary, health care charges and vocational training contributions. Paying taxes under the simplified regime is thus less laborious and – if the tax rate on turnover is not set overly high – economic. The latter should be assumed given legislators’ general intention of supporting the eligible businesses.

³⁸¹ See Almunia/Lopez-Rodriguez (2016) pp. 1 ff. They find bunching at an enforcement notch where taxpayers become subject to tax audits by the large taxpayer unit.

³⁸² See Schivardi/Torrini (2004) pp. 1 ff.; Gourio/Roys (2014) pp. 377 ff.; Garicano/Lelarge/Van Reenen (2016) pp. 3439 ff.

³⁸³ See Onji (2009) pp. 766 ff.; Liu/Lockwood (2015) pp. 1 ff.

³⁸⁴ See Chetty/Friedman/Olsen/Pistaferri (2011) pp. 749 ff.; Chetty/Friedman/Saez (2013) pp. 2683 ff.; Brockmeyer (2014) pp. 477 ff.; Devereux/Liu/Loretz (2014) pp. 19 ff.; Mortensen/Whitten (2016) pp. 1 ff.

³⁸⁵ See Brockmeyer (2014) pp. 498 ff.

³⁸⁶ The owner’s absolute control over business operations in very small owner-managed firms and the comingling of private and business-related transactions may constitute further factors contributing to increased avoidance and evasion activities in the micro-business sector.

Table 24: Bunching estimates for major size thresholds

Country	Indicator	Threshold	Excess mass (relative)	Excess mass (absolute)	Excess mass (% of population)	Standard error	t-statistic	Significance level
Belgium	turnover	€ 7.3m	0.233	8	0,0%	0.363	0.642	-
	no. of employees	25	0.929	9	0,0%	0.930	0.999	-
Hungary	turnover	HUF 6m	2.315	2,792	0,7%	0.235	9.851	**
	turnover	HUF 30m	0.722	289	0,1%	0.176	4.102	*
	turnover no. of employees	HUF 500m 25	0.120 0.427	16 240	0,0% 0,1%	0.191 0.114	0.628 3.746	- *
Latvia	turnover	€ 50,000	1.701	696	0,8%	0.200	8.505	**
	turnover no. of employees	€ 100,000 5	0.572 0.908	152 5,034	0,2% 6,1%	0.100 0.036	5.720 25.222	* **
Lithuania	no. of employees	9	0.292	59	0,1%	0.077	3.792	*
Romania	turnover	RON 220,000	8.549	3,816	0,9%	0.598	14.296	**
	turnover	€ 65,000	1.337	1,696	0,4%	0.083	16.108	**
Spain	turnover	€ 1m	0.501	424	0,1%	0.095	5.274	*
	turnover	€ 5m	-0.100	-61	0,0%	0.122	-0.820	-
	no. of employees	25	0.175	288	0,0%	0.064	2.734	-
	turnover	€ 10m	32	0.243	0,0%	0.146	1.664	-

Notes: *Excess mass (% of population)* displays the share of bunchers in the population of business covered by the AMADEUS database with a turnover of at least € 1,000 in the respective country. Standard errors are derived with a bootstrapping procedure (200 iterations). ** and * denote significance levels of 5% and 10%, respectively.

All in all, the cross-country comparison of bunching estimates suggests that firms – in particular the very smallest businesses – manage turnover and the number of employees when it is required to retain eligibility for highly beneficial tax incentives. As evidenced by the limited or inexistent bunching responses to non-administrative regimes in Belgium, Lithuania and Spain, the elasticity of reported turnover and employment appears to be smaller than for taxable income, though. Most likely, income is easier to adjust than the latter two indicators. Still, substantial irregularities in size distributions based on turnover and employment occur in Hungary, Latvia and Romania, mainly at thresholds where eligibility for simplified regimes replacing the ordinary income tax ends. Obviously, these regimes provide benefits that are big enough for taxpayers to put up with the adjustment costs necessary to remain eligible – either in the form of underreporting or in the form of forgone growth opportunities.

5.1.3 Latvia's Micro-Enterprise Scheme

In view of the observed bunching activities around eligibility thresholds for simplified regimes – in particular in Latvia – it is important to gain a better understanding of the drivers and the consequences of taxpayer bunching. The micro enterprise scheme in Latvia lends itself to this purpose for several reasons. First of all, the recent introduction of the regime facilitates the identification of the causal relationship between the regime and the observed bunching patterns. The data at hand covers years before and after the reform so that firm responses to the micro enterprise scheme can be distinguished from those being caused by previously existing regulations. Second, the micro enterprise tax includes separate eligibility thresholds for turnover and employment, which allows a comparison of effects at both decision margins. Lastly, AMADEUS offers a comparatively good coverage even of the smallest corporations in Latvia. The danger of underestimating or overestimating effects due to sample selection is thus smaller than for other countries.

5.1.3.1 Institutional Background

The micro enterprise tax was introduced by the Latvian government in September 2010. At first, it was only applicable for new firms but in 2011 eligibility was extended to all enterprises. With the reform, the government wanted to encourage entrepreneurship. It was mainly driven by the financial crisis that hit Latvia particularly hard in 2009 and 2010 and led to increased unemployment as well as to workers leaving the country en masse. The reform

introducing the micro enterprise tax also included a simplification of business registration procedures and efforts to enhance the availability of financing for the business sector.³⁸⁷

The micro enterprise tax replaces the corporate income tax as well as any social security payments for employees by a lump-sum charge of 9% on turnover. The regime can be applied if last year's turnover did not exceed € 100,000 and the number of employees amounted to five at most. Moreover, employees' salaries are capped at € 720 per month. Exceeding either threshold in the current period leads to ineligibility for the regime in the following year and penalty charges in the current year. Specifically, 2% of turnover have to be paid per employee beyond the threshold of five and any turnover exceeding € 100,000 is taxed at 20% instead of 9%.³⁸⁸

The tax regime itself combines administrative reliefs³⁸⁹ with actual tax savings for most eligible businesses. The tax base, i.e., turnover, is easier to determine and to document than taxable income.³⁹⁰ In addition, there is only one tax payment to be made instead of (at least) two, that is the CIT and social security contributions. The exact amount of actual tax savings mainly depends on the profit margin of the taxpayers and the number of employees. Loss-making firms and those with barely positive profit margins should rather seek a tax assessment based on income while the preference for turnover taxation should be more pronounced among profitable and labor-intensive firms.

5.1.3.2 *Time Trends*

As a first step in the empirical examination of taxpayer bunching in Latvia, Figures 9 and 10 display the development of the firm size distribution around the eligibility thresholds for employment and turnover, respectively, from 2009 to 2014. Around the employment threshold (see Figure 9), no irregularity in the density function is observable prior to the introduction of the regime in 2009; neither does a statistically significant effect occur in the year of the introduction in 2010 when it was only available for new enterprises.

Starting in 2011, however, the excess mass \hat{b} of firms to the left of the notch becomes noticeable and increases annually until reaching the maximum of 0.9084 in 2014. Put

³⁸⁷ See Leibus (2012) pp. 116 ff.

³⁸⁸ Salary payments exceeding the maximum salary of € 720 are taxed at 20% as well.

³⁸⁹ As a part of the micro enterprise regime, firms are also allowed to apply simplified, cash-based accounting for VAT purposes.

³⁹⁰ See Thuronyi (1996) pp. 410 ff.; European Commission (2007b) pp. 14 ff.

differently, by 2014 there are almost twice as many firms employing five employees than expected in a regulatory environment without any benefits restricted to firms with five or fewer employees. Taken at face value, there would be 5,000 more jobs available, if every firm in the excess mass below the threshold only employed one more person. Assuming the counterfactual size distribution from 2014, the number of jobs lost due to bunching behavior would even amount to over 20,000. This is more than 3% of all jobs actually provided by the firms in the sample.³⁹¹

With regard to turnover, a similar trend can be observed as the number of firms bunching below the threshold of € 100,000 also increases monotonously from 2011 to 2014.³⁹² Noticeably, the bunching also becomes increasingly sharp from 2012 to 2014, i.e., taxpayers gather more precisely at the threshold of € 100,000, which is in line with previous literature documenting learning effects over time as taxpayers become more accustomed to newly introduced thresholds.³⁹³

Altogether, Figures 9 and 10 clearly support the notion of the micro enterprise tax regime inducing the bunching behavior at the eligibility thresholds of five employees and € 100,000 of turnover.³⁹⁴ The differences in growth patterns and reported financial indicators that are discussed in the following can therefore be assumed to actually be effected by the introduction of the simplified tax regime in 2010.

³⁹¹ Adding up the employees of all firms reported in the sample yields a number of 629,439 total jobs provided. The amount of missing jobs, according to the counterfactual, amounts to 22,669 jobs, which equals 3.6% of the total number of jobs. These calculations should be considered with caution, though, as they neglect any second-order effects. The latter could alter the numbers significantly (in both directions).

³⁹² For 2009 and 2010, AMADEUS does not provide reliable data on turnover. These two years are therefore excluded.

³⁹³ See Saez (2010) pp. 180 ff.; Chetty/Friedman/Saez (2013) pp. 2683 ff.

³⁹⁴ Besides the micro enterprise support program including the micro enterprise tax, no other size-related policies referring to the thresholds of five employees and € 100,000 of turnover were introduced in Latvia during the sample period.

Figure 9: Bunching at employment threshold in Latvia (2009–2014)

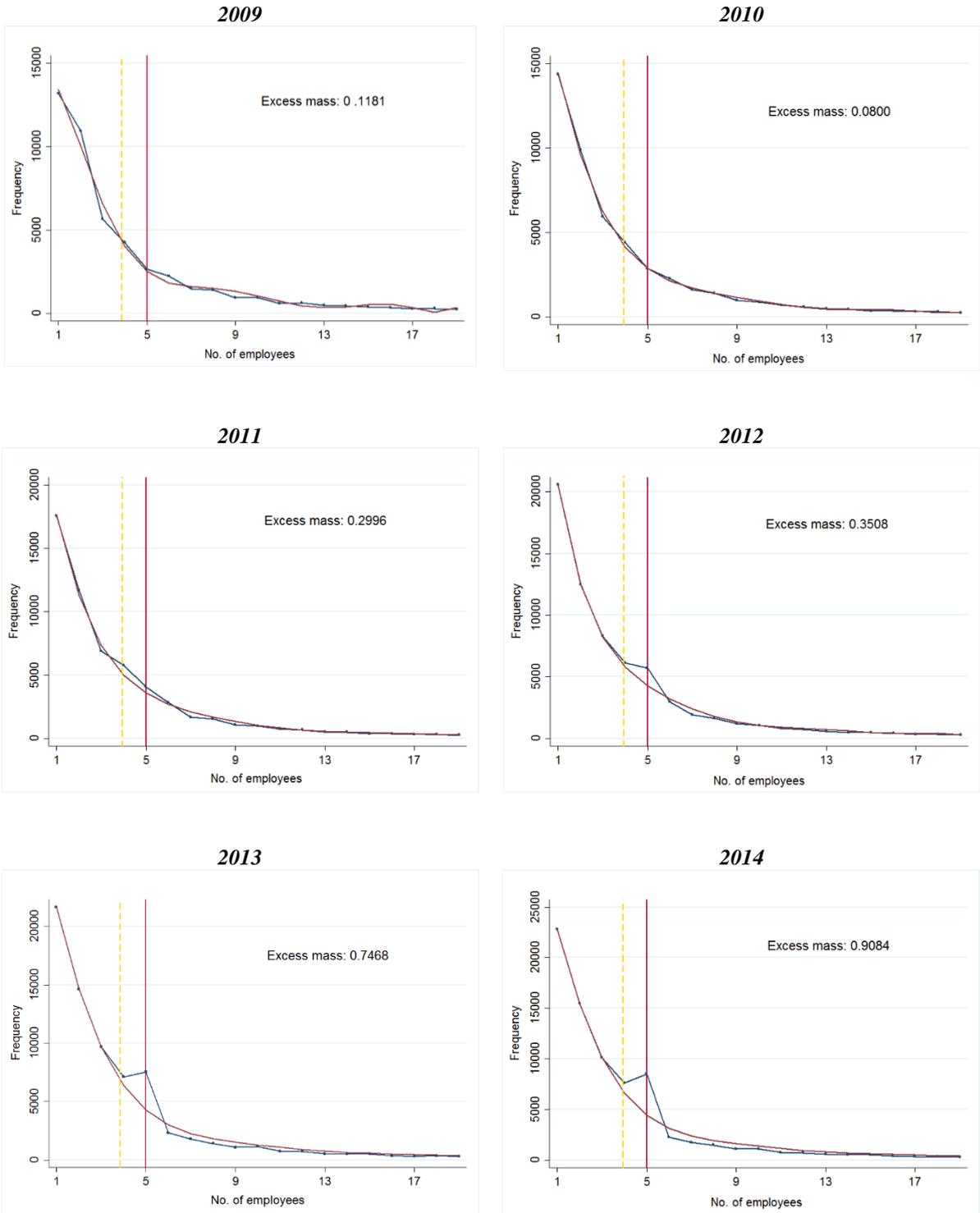
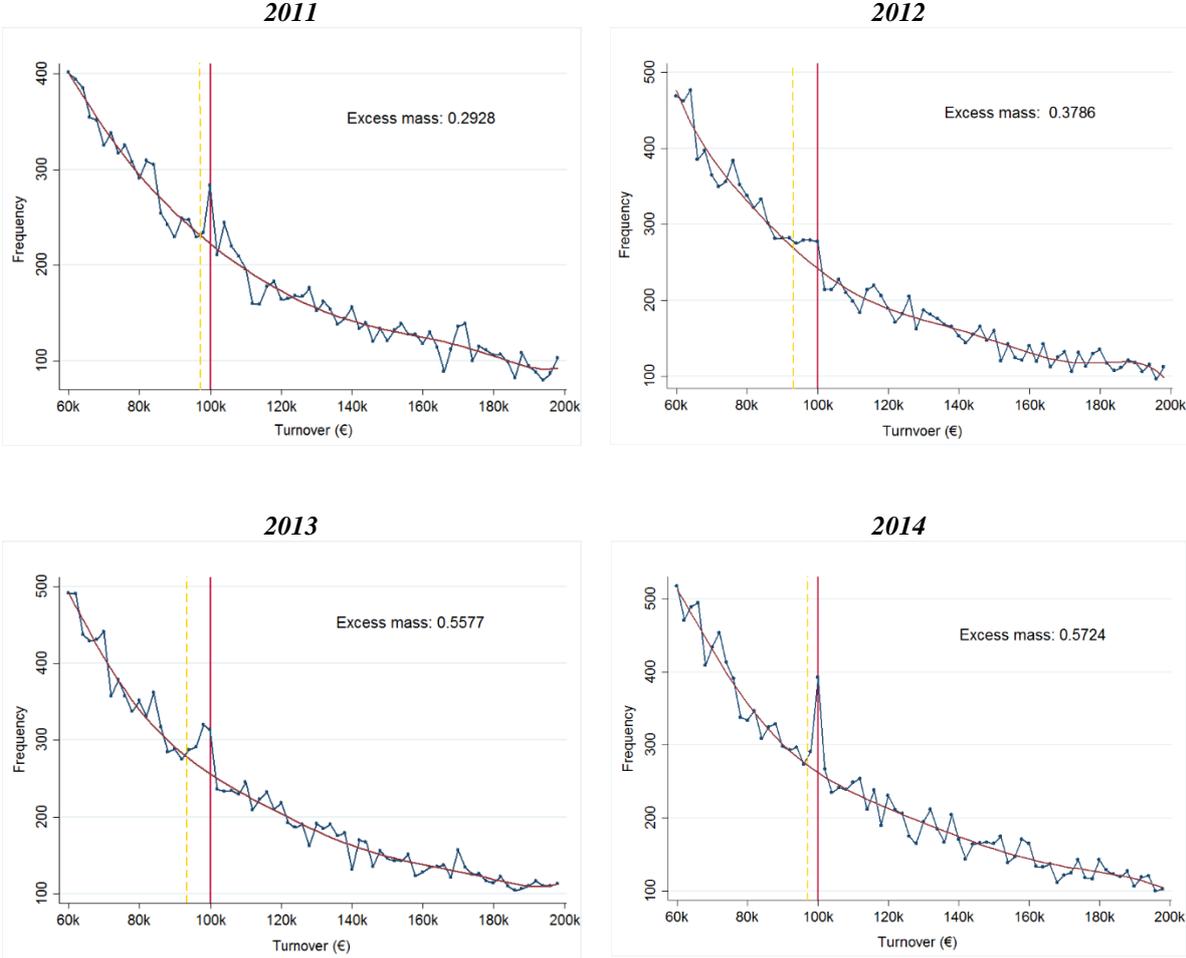


Figure 10: Bunching at turnover threshold in Latvia (2011–2014)



5.1.3.3 Tax Savings vs. Administrative Relief

As the micro enterprise scheme affects the tax liability as well as the compliance burden of companies, there are different factors potentially motivating firms to bunch below the eligibility thresholds. They could avoid the increased compliance efforts associated with exiting the simplified scheme or they could seek reduced tax payments emanating from the altered tax base. Which one of the two factors primarily drives firms’ bunching behavior is ultimately an empirical question.

As described above, the micro enterprise tax is based on turnover instead of taxing net income. The regime is thus more beneficial for highly profitable entities than it is for less or even unprofitable firms. In fact, turnover taxation is highly unattractive for loss-making

enterprises who would not pay any income taxes under the ordinary regime. Instead, they could build up future loss carry forwards that reduce future tax payments. In the case of the Latvian micro enterprise scheme, however, social security contributions also need to be taken into consideration as they make up a potentially large share of the tax burden. Precisely, the maximum turnover tax of € 9,000 (which equals 9% of the eligibility maximum of € 100,000), is still lower than the due social security contributions (24%) for five employees who earn close to the maximum salary of € 720 per month that is allowed under the regime ($5 * € 720 * 12 * 24\% = € 10,368$). Hence, even in the absence of positive net income, the regime is usually beneficial. Assuming the average turnover of potentially eligible businesses of € 40,000 and a staff of five employees, for example, a firm would have to incur losses of € 45,000 or more to be better off under the ordinary regime than under the micro enterprise scheme.³⁹⁵

Building on these calculations, Figures 11a-c display the bunching behavior of different subsamples of firms that distinguish with regard to their profitability. Figure 11a shows the size distribution of all firms with a positive pre-tax profit while figure 11b covers all loss-making firms. Figure 11c only includes those businesses who incur at least € 45,000 of losses in 2014. Profitable firms incur the largest tax savings and should thus display the strongest bunching responses. The firms in Figure 11c, in contrast, should have little reason to choose the micro enterprise tax if they only consider the size of the tax liability in the current period. If bunching is observed even for these enterprises, this would strongly indicate administrative aspects to play a role for the attractiveness of the micro enterprise scheme as well.

Expectedly, Figures 11a-c show bunching to be the most distinct among profitable firms ($\hat{b} = 0.7618$ in Figure 11a compared to $\hat{b} = 0.2512$ in Figure 11c). However, even for unprofitable businesses (Figure 11b) and highly unprofitable businesses (Figure 11c), bunching is recognizable and statistically significant at the 5% level (all loss-making firms) and the 10% level (only firms with at least € 45,000 of losses), respectively. Bunching at eligibility thresholds for the simplified regime in Latvia therefore seems to be driven by tax savings as well as administrative considerations. Comparing the size of the excess masses in Figure 11a (0.7618) and 11c (0.2512), suggests that tax savings constitute the more important driver of bunching, though.

³⁹⁵ The calculation of turnover figures for which taxpayers are indifferent between both regimes assumes loss carry-forwards to be fully deductible in future periods at the current CIT rate of 15% on net income. Consequently, the indifference loss can be derived as follows: $€ 40,000 * 9\% \approx € 10,368 - \text{loss}_{\text{indiff}} * 15\%$.

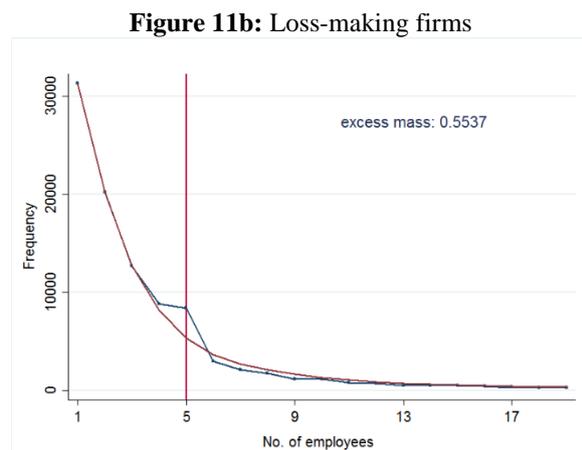
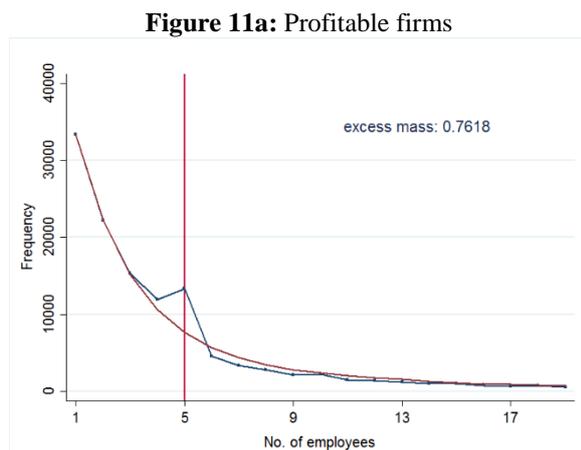
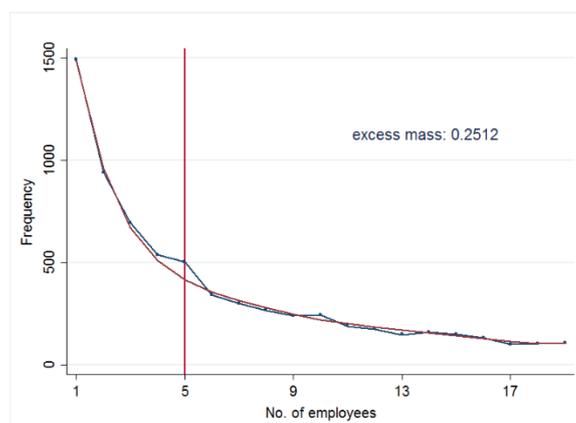


Figure 11c: Firms with losses \geq € 45,000



This finding also highlights that the attractiveness of the micro enterprise scheme partly stems from taxpayers' self-selection into the available regimes. Eligible taxpayers can choose if they want to be taxed on turnover or if they prefer income-based taxation. Larger entities, in contrast, are stuck in the ordinary regime. This asymmetry, of course, is in contradiction to the guiding principles of horizontal equity and vertical equity as taxpayers incurring the same amount of income can end up with completely different tax liabilities while taxpayers with entirely different amounts of taxable income could end up with the same tax liability.³⁹⁶

³⁹⁶ See King (1983) pp. 99 ff.; Pashev (2006) pp. 399 ff. In fact, the turnover tax even introduces regressive elements to income taxation as the average tax rate on income decreases in a firm's profitability. This is opposed to the guiding principle of vertical equity.

5.1.3.4 Real Responses, Intertemporal Substitution and Underreporting

In view of taxpayers' bunching responses to the eligibility thresholds for the micro enterprise scheme in Latvia, the question of potential implications for mid and long-term firm growth occurs. Given that the simplified regime aims at supporting the growth of companies and the hiring of new staff, any impediment to firm and employment growth would naturally be opposed to the goals of the regime. Bunching, however, could also be the result of intertemporal substitution and underreporting, which would be less harmful with regard to social welfare.

In order to gain a better understanding of the economic effects of bunching at employment and turnover thresholds, Table 25 explores the impact of the Latvian employment and turnover limits in the vicinity of the respective thresholds in 2012 and 2013.³⁹⁷ If taxpayers' bunching is primarily due to intertemporal substitution and short-term adjustments that do not have a lasting impact on firm growth, bunchers and non-bunchers should not show overly significant differences with regard to their growth patterns after having been observed to bunch. There should be roughly the same amounts of growing, declining and stagnating firms. If, however, bunching has a lasting effect on firm growth, i.e., if bunching leads to an ongoing stagnation in the development of the respective firms, bunchers should also be much less likely to grow after they have bunched.

Accordingly, column (1) of Table 25 compares the shares of firms that either increase (*INCREASE*), retain (*CONSTANT*) or decrease the number of employees (*DECREASE*) after they were observed to have either five employees (subsequently labeled as bunchers) or six employees (non-bunchers). The results in column (1) reveal statistically significant differences between bunchers and non-bunchers. The share of firms exactly retaining their staff level is significantly larger among firms with five than it is among firms with six employees (by 17.4 percentage points). Moreover, bunchers are significantly less likely to hire additional personnel once they have gathered exactly at the employment threshold of five employees (by 8.3 percentage points). Put differently, retaining eligibility for the micro enterprise tax discourages one out of twelve firms with five employees from hiring. The magnitude of the differences in growth probabilities also indicates that bunching at the employment threshold is not only the result of a minor one-year adjustment but rather of a lasting deceleration of (re-

³⁹⁷ Statistically significant bunching at the employment threshold occurs in 2012 for the first time. Growth rates for firms bunching in 2014 cannot be considered because the required data from 2015 are not yet available.

ported) employment growth. At least for those firms directly below the employment threshold, the regime therefore falls short of achieving its primary goal of creating more jobs. In addition, firms with six employees are found to be especially prone to laying off people (by 9.1 percentage points), which grants them future eligibility for the micro enterprise scheme. Hence, firms around the threshold do not only respond to the micro enterprise scheme by remaining small but they are even motivated to lay off employees in order to gain eligibility.

Table 25: Growth patterns for bunching and non-bunching firms

	Change in employment (1)			Change in turnover (2)		
	5 employ- ees _t	6 employ- ees _t	Δ	[95k;100k] _t	[100k;105k] _t	Δ
<i>INCREASE</i> _{t+1}	0.145	0.228	-0.083** (0.007)	0.233	0.244	-0.011 (0.025)
<i>CONSTANT</i> _{t+1}	0.540	0.366	0.174** (0.010)	0.518	0.435	0.083 (0.029)
<i>DECREASE</i> _{t+1}	0.315	0.406	-0.091** (0.009)	0.248	0.320	-0.072 (0.026)
Observations	11,196			1,221		

Notes: The data are for 2012 and 2013. Changes in the number of employees are defined as follows: *INCREASE* = 1 if no. of employees_{t+1} > no. of employees_t and zero otherwise; *CONSTANT* = 1 if no. of employees_{t+1} = no. of employees_t and zero otherwise; *DECREASE* = 1 if no. of employees_{t+1} < no. of employees_t and zero otherwise. Changes in turnover are defined as follows: *INCREASE* = 1 if turnover_{t+1} ≥ 1.2 * turnover_t; *CONSTANT* = 1 if 0.8 * turnover_t ≤ turnover_{t+1} ≤ 1.2 * turnover_t and zero otherwise; *DECREASE* = 1 if turnover_{t+1} ≤ 0.8 * turnover_t and zero otherwise. Averages for *INCREASE*, *CONSTANT* and *DECREASE* are given for all firms with 5 and 6 employees, respectively. Δ reports the difference in averages between both groups. ** and * denote significance levels of 5% and 10%, respectively.

Column (2) of Table 25 compares the growth patterns of bunchers and non-bunchers at the turnover threshold. Specifically, firms reporting turnover in between € 95,000 and € 100,000 are compared to firms with turnover between € 100,000 and € 105,000. They are classified as stagnant if their turnover does not increase or decrease by more than 20% after they are observed to be either bunchers or non-bunchers (i.e., above or below the turnover threshold).³⁹⁸ Interestingly, no statistically significant differences in growth patterns are observable for bunchers and non-bunchers around the turnover threshold of € 100,000. It appears that turnover thresholds are less susceptible to actually and lastingly slow down firm growth than employment thresholds (which is also indicated by the smaller \hat{b} at the turnover threshold).

³⁹⁸ The threshold of 20% is chosen such that the relative increase is similar to the previously analyzed increases in employment (i.e., hiring one employee means an increase of 20% for a firm previously employing five employees).

Table 26: Growth patterns for bunching and non-bunching firms (robustness checks)

	Year prior to regime (1)			Ineligible firms (2)			Matched sample (1-to-1) (3)			Matched sample (1-to-5) (4)			Matched sample (kernel) (5)		
	5 emp.	6 emp.	Δ	5 emp.	6 emp.	Δ	5 emp.	6 emp.	Δ	5 emp.	6 emp.	Δ	5 emp.	6 emp.	Δ
<i>INCREASE</i>	0.337	0.346	-0.009 (0.053)	0.256	0.275	-0.019 (0.013)	0.145	0.229	-0.084** (0.011)	0.145	0.228	-0.083** (0.009)	0.145	0.229	-0.084** (0.008)
<i>CONSTANT</i>	0.349	0.353	-0.004 (0.053)	0.451	0.381	-0.070* (0.014)	0.540	0.360	0.180** (0.013)	0.540	0.355	0.185** (0.010)	0.540	0.367	0.173** (0.010)
<i>DECREASE</i>	0.314	0.301	0.013 (0.051)	0.293	0.344	-0.051* (0.013)	0.315	0.411	-0.096** (0.013)	0.315	0.417	-0.102** (0.010)	0.315	0.404	-0.089** (0.010)
Observat.	325			4,984			11,196			11,196			11,196		

Notes: The data are for 2009 and 2010 in column 1 and for 2012 and 2013 in columns 2 to 5. Changes in the number of employees are defined as follows: *INCREASE* = 1 if no. of employees_{t+1} > no. of employees_t and zero otherwise; *CONSTANT* = 1 if no. of employees_t = no. of employees_{t+1} and zero otherwise; *DECREASE* = 1 if no. of employees_{t+1} < no. of employees_t and zero otherwise. Averages for *INCREASE*, *CONSTANT* and *DECREASE* are given for all firms with 5 and 6 employees, respectively. Δ reports the difference in averages between both groups. ** and * denote significance levels of 5% and 10%, respectively.

Methodologically, there may be several concerns with the above approach of comparing differences in growth patterns of bunching and non-bunching firms around the employment threshold. First of all, there could be structural differences between firms with five employees and those with six that do not have anything to do with the micro enterprise scheme in Latvia but drive the growth probabilities of the respective firms. Table 26 addresses this issue in several ways. In column (1), the shares of growing, stagnating and declining entities are compared for 2009 and 2010, the years when the regime had not yet taken effect. If there are structural differences between enterprises with five and with six employees, the results for 2009 and 2010 should be similar to the results in 2012 and 2013. However, no significant differences in growth patterns are found for the former period. Apparently, Latvian firms with five employees and those with six can be expected to develop similarly in the absence of the micro enterprise scheme.

In line with this finding, column (2) examines growth patterns for 2012 and 2013, but only considers enterprises (with five and six employees) which reported more than € 100,000 of turnover. These firms should mostly be ineligible for the micro regime or only benefit to a limited degree.³⁹⁹ Expectedly, the differences in the shares of growing, stagnating and declining firms are much smaller and statistically less significant than for firms not exceeding the turnover threshold. Again, this reinforces that there are no structural differences between firms with five and with six employees which induce differences in growth patterns. Instead, the results in columns (1) and (2) suggest the micro enterprise scheme to be the driving force discouraging firms with five employees from growing and incentivizing those with six employees to reduce the number of employees.

Selection bias is another concern with regard to the baseline results in Table 25. Firms with certain characteristics may be more susceptible to bunching than others and if these firms showed different growth dynamics irrespective of the micro enterprise regime, the results would not display a causal effect but rather a correlation of firm characteristics and the propensity to bunch. Columns (3) to (5) address this issue by performing several matching procedures. It is the basic idea of these procedures to generate a control group, i.e., a group of firms with six employees, that is made up of firms being as similar as possible to the firms in the bunching group. If this adjusted control group still shows different growth patterns, it is

³⁹⁹ Businesses with more than € 100,000 are ineligible in future years. If they did not exceed the turnover threshold in the previous year, they are eligible in the current period, though, and subject to considerably higher tax rates on the excess turnover. See section 5.1.3.1.

reasonable to assume that the latter are induced by the introduction of the micro enterprise scheme. The degree of similarity is based on a so-called propensity score. Following the approach developed by Heckman et al. (1997) and Dehejiba and Wahba (1999), it is derived by means of a probit estimation⁴⁰⁰ including all relevant and observable firm characteristics that are likely to impact future growth as well as the likeliness of being a (non-)buncher (e.g., total assets, turnover, growth rates in previous periods).⁴⁰¹ Building on the propensity score, the control group is generated with a matching algorithm, which – based on the propensity scores – assigns observations from the group of firms with six employees to the new control group. In column (3), 1-to-1 matching is applied, while the estimates in columns (4) and (5) build on nearest-neighbor matching with five matching partners and kernel matching.⁴⁰² For each matching algorithm, the results from Table 25 are confirmed. Matching firms with five and six employees, respectively, does not change the main finding of bunchers refraining from hiring personnel and non-bunchers tending to lay off people in order to gain eligibility.

Lastly, the question occurs if the differences observed in growth patterns for bunchers and non-bunchers reflect real economic responses or if they are simply the result of (permanent) underreporting. Prior bunching studies have indeed found taxpayers to predominantly bunch by underreporting instead of actually reducing firm size or forfeiting growth opportunities.⁴⁰³ The underreporting can occur in the form of entrepreneurs taking advantage of (legal) reporting choices or in the form of businesses engaging in fraudulent misreporting. Distinguishing real responses and underreporting, of course, is not a trivial task given that the analysis builds on data reported by the firms in question. What points at real responses in the context of the Latvian micro enterprise tax is, above all, the fact that the most distinct bunching is observed for employment. Reporting the number of employees can generally be assumed to involve less discretion than reporting turnover or, even more so, taxable income.⁴⁰⁴ Consequently, an entrepreneur is probably forced to commit fraud, namely to hire illicit

⁴⁰⁰ The results of the probit estimation are displayed in Table A4 in the appendix.

⁴⁰¹ See Heckman/Ichimura/Todd (1997) pp. 605 ff.; Dehejia/Wahba (1999) pp. 1053 ff.

⁴⁰² Kernel matching uses weighted averages of all observations in the control group. The weights reflect the propensity score. Each matching algorithm is performed with replacement, i.e., observations from the control group can be used multiple times. For a detailed description of the matching algorithms as well as derivation of the matching score, see Caliendo/Kopeinig (2005) pp. 5 ff.

⁴⁰³ See Saez (2010) pp. 196 ff.; Brockmeyer (2014) pp 492 ff.; Liu/Lockwood (2015) pp. 27 f.; Almunia/Lopez-Rodriguez (2016) pp. 53 ff.; Asatryan/Peichl (2016) pp. 22 ff.

⁴⁰⁴ Underreporting income is often easily achieved by increasing expenditures, e.g., through preponed investments. Turnover, on the other hand, generally provides less leeway with regard to legal accounting choices. Transactions, of course, could be postponed by a few days or weeks around the end of the accounting period, thereby achieving lower recorded sales in a given period. See Brockmeyer (2014) pp. 492 ff.

workers, if he intends to underreport the number of employees. Even misreporting, however, is presumably more difficult in the context of employment than it is for other indicators as it requires the cooperation of the respective (non-)employee, who forgoes the benefits of contractual employment and renders himself liable to prosecution as well.⁴⁰⁵ Altogether, irregularities in employment numbers are thus very likely to reflect real responses rather than misreporting.⁴⁰⁶

Notwithstanding these arguments, other factors than the actual abandonment of hiring activities could drive the observed bunching. Bunchers could, for example, refrain from employing people and instead hire them as independent service providers, effectively turning employment into contract work. If firms were able to circumvent employment-based thresholds by such means, the actual distortion of firm growth and the related misallocation of resources would be smaller than indicated by the results in Tables 25 and 26.⁴⁰⁷ In this case, the development of firm size indicators other than employment should not differ for bunching and non-bunching enterprises as taxpayers would continue to grow and not have a reason to underreport these other indicators.⁴⁰⁸

Table 27 tests this conjecture by regressing the post-2012 growth rates with regard to employment, turnover and total assets on *BUNCH_5EMP*, a dummy variable indicating whether a firm bunched at the employment threshold in 2012. In other words, the regressions measure the impact of being a buncher (i.e., a firm with five employees) in a given year on the expected growth rate in the following year for the three firm size indicators defined by the European Commission. The regression equation is as follows:

$$GROWTH_{i,t} = \beta_0 + \beta_1 BUNCH_5EMP_{i,2012} + \beta_2 X + \varepsilon_i$$

where $GROWTH_{i,t}$ is the growth rate with regard to the respective indicator (i.e., employment, turnover or total assets) of firm i in period t (i.e., in 2013 or in 2014) and X is a vector of con-

⁴⁰⁵ Misreporting turnover, in contrast, does not necessarily require the support of third parties, especially when products or services are sold to end consumers who cannot offset acquisition costs for VAT purposes.

⁴⁰⁶ This assumption is shared and supported by recent papers examining the impact of size-dependent labor regulation. See Schivardi/Torrini (2004) pp. 1 ff.; Braguinsky/Branstetter/Regateiro (2011) pp. 1 ff.; Gourio/Roys (2014) pp. 377 ff.; Garicano/Lelarge/Van Reenen (2016) pp. 3439 ff.

⁴⁰⁷ Deadweight losses would still occur, though, as enterprises have to put effort into arranging their affairs in ways that ensure the retention of eligibility for the micro enterprise regime. See Feldstein (1999) pp. 674 ff.

⁴⁰⁸ Turnover growth may be affected if the respective businesses are also at risk of breaking the turnover threshold. The percentage of businesses bunching at both thresholds only amounts to a very small percentage, though.

control variables (the natural logarithms of the absolute levels of turnover, total assets, employment and profit before taxes in 2012 as well as growth rates with regard to turnover, total assets and employment in previous years). All firms of the business population are included in the estimations. If firms do not actually slow down growth but only underreport employment, the estimated coefficient for *BUNCH_5EMP* should be negative when considering employment growth (column (1)) and insignificant for turnover and total assets (columns (2) and (3)) as there is no obvious reason to underreport the latter two measures.⁴⁰⁹

Table 27: The influence of bunching on firm growth

	Growth rate ₂₀₁₂₋₂₀₁₃			Growth rate ₂₀₁₂₋₂₀₁₄		
	Employ. (1)	Turnover (2)	Tot. Ass. (3)	Employ. (4)	Turnover (5)	Tot. ass. (6)
<i>BUNCH_5EMP</i>	-0.032*** (0.008)	-0.033** (0.013)	-0.051*** (0.014)	-0.048*** (0.010)	-0.065*** (0.021)	-0.102*** (0.023)
<i>LN_TURNOVER</i> ₂₀₁₂	0.043*** (0.002)	-0.084*** (0.007)	0.045*** (0.004)	0.066*** (0.003)	-0.132*** (0.010)	0.072*** (0.007)
<i>LN_ASSETS</i> ₂₀₁₂	-0.001 (0.002)	0.067*** (0.005)	-0.085*** (0.005)	-0.000 (0.003)	0.075*** (0.008)	-0.167*** (0.009)
<i>LN_EMPLOYEE</i> ₂₀₁₂	-0.053*** (0.003)	0.032*** (0.005)	-0.007 (0.004)	-0.096*** (0.004)	0.052*** (0.007)	-0.006 (0.007)
<i>LN_PROFIT</i> ₂₀₁₂	-0.005*** (0.001)	-0.022*** (0.003)	0.025*** (0.003)	-0.003 (0.002)	-0.020*** (0.004)	0.052*** (0.005)
<i>GROWTH_TO</i> ₂₀₁₁₋₂₀₁₂	0.001 (0.004)	-0.037*** (0.009)	-0.002 (0.007)	-0.003 (0.005)	-0.042*** (0.013)	0.000 (0.012)
<i>GROWTH_TO</i> ₂₀₁₀₋₂₀₁₂	0.010*** (0.002)	-0.006 (0.005)	0.016*** (0.004)	0.017*** (0.003)	0.001 (0.007)	0.037*** (0.007)
<i>GROWTH_AS</i> ₂₀₁₁₋₂₀₁₂	0.043*** (0.005)	0.109*** (0.007)	0.008 (0.010)	0.056*** (0.007)	0.116*** (0.016)	0.027 (0.017)
<i>GROWTH_AS</i> ₂₀₁₀₋₂₀₁₂	0.012*** (0.003)	0.013** (0.006)	-0.008 (0.005)	0.015*** (0.003)	0.014* (0.008)	-0.031*** (0.008)
<i>GROWTH_EM</i> ₂₀₁₁₋₂₀₁₂	-0.028** (0.011)	0.046** (0.020)	-0.010 (0.018)	-0.015 (0.015)	0.061** (0.030)	0.005 (0.032)
<i>GROWTH_EM</i> ₂₀₁₀₋₂₀₁₂	-0.030*** (0.006)	0.011 (0.012)	0.028** (0.011)	-0.042*** (0.009)	0.027 (0.018)	0.055*** (0.019)
<i>Constant</i>	-0.372*** (0.017)	0.411*** (0.044)	0.296*** (0.035)	-0.599*** (0.025)	0.887*** (0.066)	0.767*** (0.061)
<i>Observations</i>	25,088	25,096	25,108	24,242	24,249	24,257
<i>Adj. R²</i>	0.055	0.041	0.035	0.067	0.033	0.051

Notes: The dependent variable is the growth rate with respect to the number of employees in columns (1) and (4), turnover in columns (2) and (5) and total assets in columns (3) and (6). *BUNCH_5EMP* is a dummy variable indicating if a firm employed exactly 5 employees in 2012. *LN_TURNOVER*, *LN_ASSETS*, *LN_EMPLOYEE* and *LN_PROFIT* are the natural logarithms of reported turnover, assets, employment and profit before tax in 2012. *GROWTH_TO*, *GROWTH_AS* and *GROWTH_EM* are the growth rates with regard to turnover, total assets and employment. All estimates are derived using OLS regressions. Robust standard errors are given in parentheses. ***, ** and * denote significance levels of 1%, 5% and 10%, respectively.

⁴⁰⁹ The coefficient in column (3) could even be positive if labor is replaced by capital in the production process.

The results in columns (1) to (3) indicate that being a buncher reduces expected growth with regard to the number of employees as well as with regard to turnover and total assets. The coefficients for the latter two indicators (-0.033 and -0.051 , respectively) are negative at all conventional significance levels and even exceed the coefficient for employment (-0.032). The results suggest that the employment threshold not induces taxpayers to stop hiring but ultimately affects overall firm growth irrespective of the size indicators considered. As a consequence, turnover and asset growth stagnates as well. This finding is reinforced by the results in columns (4) to (6), where the two-year growth rates of employment, turnover and total assets are used as dependent variables. The coefficients for *BUNCH_5EMP* again remain negative and highly significant for all three indicators. In fact, the magnitude becomes even higher. Hence, bunching appears to not only be driven by underreporting or firms delaying expansions for a short period of time. Instead, even a couple of years after bunching at the employment threshold, enterprises still grow at a slower pace and irrespective of the considered firm size indicator, which hints at substantial real responses being responsible for the observed bunching patterns.

5.1.4 Conclusion

The empirical analysis of taxpayer bunching shows businesses to actively avoid the forfeiture of SME tax incentives by bunching below the size-based eligibility thresholds. In contrast to the majority of previous studies, the analysis at hand focusses on thresholds referring to turnover and the number of employees. These thresholds create notches in the tax system as eligibility for regimes runs out as soon as businesses exceed the respective limits. In general, bunching responses for these two indicators appear to be weaker than for taxable income. This can most likely be explained by the ease of managing income as opposed to other size measures.

With regard to the different types of SME incentives, taxpayers are found to be especially prone to bunching when eligibility for simplified regimes is at stake. These regimes mostly provide far-reaching facilitations in the determination of the tax base as well as substantial tax savings. In contrast to that, only limited bunching is observed for tax incentives that are part of the ordinary assessment procedures of the corporate income tax, i.e., special CIT rates, allowances and tax credits.

The investigation of firms' bunching behavior at the eligibility thresholds of one of the simplified regimes, the Latvian micro enterprise scheme, yields further insights. First of all, bunching patterns strongly suggest that the administrative relief as well as the potential for tax savings associated with turnover taxes induce taxpayers to bunch. With regard to the relative significance of each factor, the tax savings aspect dominates for most Latvian businesses. In this respect, the micro enterprise tax is particularly beneficial for highly profitable firms, who have the strongest interest in being taxed on turnover and who are also the most susceptible to bunching.

The second main finding of the analysis of the Latvian micro enterprise regime is that bunching behavior cannot only be attributed to mere underreporting. The results rather suggest taxpayers around the employment threshold to really avoid hiring additional employees or even to lay off people in order to gain eligibility for the scheme. As a consequence, overall firm growth slows down. Obviously, this is the opposite of the intended effect and should be seen very critical. Given the high number of firms around the threshold of five employees (over 10% of all businesses), the bunching implications for the job market are considerable. The number of jobs falling away due to bunching could amount to over 3% of all jobs actually provided by the sample firms.

Altogether, two main policy implications emerge from the above analysis. First, policy-makers should avoid explicit size thresholds as far as possible when designing SME tax incentives. In particular, they should refrain from employment thresholds, as they are most likely to induce real responses in the form of reduced hiring activity and firm growth. As a second take-away, legislators should be careful not to offer overly advantageous regimes when trying to simplify taxation for the very smallest businesses. Taxing turnover instead of income, for example, can lead to huge savings for enterprises, especially those with high profit margins. As a consequence, competition between eligible and ineligible firms is severely distorted and the equity of the tax systems suffers considerably. Departing from net income as the calculation basis of the corporate (or personal) income tax should thus be the last resort for policy-makers.

5.2 *Distortion of Legal Form Choice*

If SME tax incentives are exclusively available for certain kinds of SMEs, other distortions than the abovementioned bunching behavior of taxpayers may occur. The guiding principle of neutrality generally dictates reliefs to be granted irrespective of legal form and other firm characteristics.⁴¹⁰ In practice, however, eligibility for currently available regimes as well as the actual size of the relief are highly dependent on the specific properties of taxpayers, e.g. the form of financing they choose, the amount of taxable income they incur or the industry and regions they operate in. Hence, SME incentives are likely to not only discriminate against large enterprises but also against SMEs that are ineligible due to other features than firm size.

Simplified regimes of tax accounting are one example of discriminatory SME reliefs. The simplified cash-based regimes are usually offered exclusively to non-corporate entities and may therefore influence the legal form decision of entrepreneurs. As a consequence, businesses may ultimately operate under legal forms that would not be optimal for them in the absence of taxation, e.g., in terms of liability or access to capital. The following study tests this conjecture, thereby providing an enhanced understanding of the distortionary effects of SME tax incentives.⁴¹¹

5.2.1 *Introduction*

This paper addresses the broad research question whether accounting rules affect real economic decisions. Specifically, we study whether the ability to choose simplified methods of tax accounting is an important consideration in legal form decisions. While prior research explored the impact of statutory tax rates on legal form choice,⁴¹² our study focuses on regimes of simplified tax accounting and the incentive they provide to choose the legal form of business that offers eligibility.

⁴¹⁰ See Spengel/Müller-Rees/Endres/Harhoff/Heinemann/Hellwig/Hüther/Regierer/Schön/Stein (2009) p. 84; European Commission (2015b) pp. 150 f.

⁴¹¹ The analysis presented in Section 5.2 is joint work with Jost Heckemeyer and will be published in the *European Accounting Review*. See Bergner/Heckemeyer (forthcoming).

⁴¹² See Gordon/MacKie-Mason (1994) pp. 279 ff.; MacKie-Mason/Gordon (1997) pp. 477 ff.; Goolsbee (1998) pp. 143 ff.; Goolsbee (2004) pp. 2283 ff.; Luna/Murray (2010) pp. 995 ff.; Liu (2014) pp. 387 ff.

The effect of tax accounting rules on policy goals and aggregate outcomes such as equitability and neutrality have been assessed by previous literature.⁴¹³ More recently, Goncharov and Jacob (2014) show that the definition of taxable income on a cash or accrual basis is driven by the tax regulator's intention to achieve a desirable distribution of corporate tax revenues and, at the same time, affects the correlation between tax revenues and economic activity.⁴¹⁴ We investigate whether tax accounting rules actively support a shift of firms and economic activity to the non-corporate sector of business.

In many countries, small businesses can use simplified methods of accounting to determine their taxable income. Most commonly, cash-based accounting is offered as an alternative to the accrual approach. Simply paying tax on the amount of cash collected minus acceptable operating expenses is supposed to be associated with a significant reduction in tax compliance costs.⁴¹⁵ In several countries, cash accounting is complemented by elements of presumptive taxation, i.e., certain kinds of expenses are not recorded but estimated, resulting in an even higher degree of simplification. The latest country to allow small businesses to shift from accrual to simplified tax accounting is the United Kingdom. In 2012, Treasury Minister David Gauke announced:⁴¹⁶

'We want the smallest businesses to be able to choose the method of accounting that works best for their business. The simplified system will provide this flexibility, give greater certainty, and simplify the tax calculations for many small businesses.'

Tax-related compliance costs include a substantial part of fixed components. As a consequence, the compliance burden, as a percentage of income, becomes disproportionately higher the smaller the scale of business.⁴¹⁷ By providing simplified tax accounting for small enterprises, legislators seek to prevent small firms from being placed at a competitive disadvantage. From this point of view, simplified tax accounting can be considered as enhancing

⁴¹³ See Samuelson (1964) pp. 604 ff.; Stiglitz (1976) pp. 303 ff.; Auerbach (1979) pp. 589 ff.; Dye/McGuire (1991) pp. 55 ff.

⁴¹⁴ See Goncharov/Jacob (2014) pp. 1127 ff.

⁴¹⁵ See European Commission (2007b) p. 14.

⁴¹⁶ See Her Majesty's Revenue and Customs (2012) p. 3.

⁴¹⁷ See Sandford/Godwin/Hardwick (1989) pp. 191 ff.; Slemrod/Blumenthal (1996) pp. 421 ff.; Tran-Nam/Evans/Walpole/Ritchie (2000) pp. 248 ff.; Eichfelder/Schorn (2012) p. 201; Blaufus/Eichfelder/Hundsdoerfer (2014) pp. 13 ff.

efficiency by avoiding underinvestment in the small business sector.⁴¹⁸ At the same time, special tax regimes may, paradoxically, impose efficiency costs themselves if they are not well integrated with the normal tax system.⁴¹⁹

Simplified tax accounting is generally only available to non-corporate businesses.⁴²⁰ As a consequence, it potentially introduces distortions at the boundary between self-employment in the form of sole proprietorships and owner-managed incorporated businesses. If simplified tax accounting is indeed associated with a net benefit, taking into account reductions in compliance costs as well as the non-tax benefits of proper bookkeeping, its (un-)availability can change the relative gain to incorporation.⁴²¹

We test this conjecture using a sample of corporate share data derived from Eurostat's Business Demography for 27 European countries over the period 2004 - 2010. Employing a difference-in-differences approach, we estimate the effect of variation in eligibility thresholds for simplified tax accounting by comparing the change in countries' non-corporate shares of business before and after a change in thresholds relative to the change in non-corporate shares of business in countries with a constant regime. We subsequently generalize the approach by including full sets of fixed effects for the time and cross-section dimension of our data. In a series of additional analyses, we explore the timing of responses, refine the measurement of the scope of simplified tax accounting and check the robustness of our results to different definitions of the dependent variable as well as alternative estimation strategies that account for nonlinearities in the empirical relationship at stake.

Our results suggest that simplified tax accounting indeed distorts legal form decisions of eligible businesses. Quantitatively, we estimate an increase of the eligibility threshold by € 100,000 to increase the non-corporate firm share by about 0.47 percentage points. Moreover, our results suggest that a 1% shift in the eligibility threshold increases the non-corporate share of business by about 0.013 percentage points. Taking the example of the United King-

⁴¹⁸ See OECD (2009a) pp. 84 ff.

⁴¹⁹ See Bird/Wallace (2004) pp. 143 ff.; Keen (2013) p. 27.

⁴²⁰ Even if simplifications comparable to those for small unincorporated businesses were available to small corporations, these would not offer real benefits since they are already obliged to draft commercial accounts on the basis of double-entry bookkeeping. See European Commission (2007b) pp. 14 ff.

⁴²¹ The partitioning of taxpayers most likely causes further distortions apart from legal form choice. When eligibility criteria are defined according to firm size, enterprises may be inclined to remain small in order to ensure beneficial tax treatment. Lately, numerous studies have confirmed bunching behavior around kinks and notches in tax legislation. See Saez (2010) pp. 180 ff.; Kleven/Waseem (2013) pp. 669 ff.; Almunia/Lopez-Rodriguez (2016) pp. 1 ff.; Slemrod/Gillitzer (2014) pp. 1 ff.

dom, where simplified tax accounting was introduced in 2012, back-of-the-envelope calculations on the basis of our results show that about one in a hundred newly eligible entrepreneurs might refrain from incorporation due to the introduction of the simplified regime.

Our study contributes to the literature in several ways. To the best of our knowledge, we are the first to study the impact of simplified tax accounting on legal form decisions. Some previous studies, however, have examined whether accounting rules affect business decisions. Graham, Harvey, and Rajgopal (2005) find that managers would sacrifice long-term value to report smoother earnings and Graham, Hanlon, and Shevlin (2010) provide evidence that financial reporting consequences affect corporate investment and profit repatriation decisions.⁴²² Only a very few studies deal with special tax regimes in the context of legal form choice.⁴²³ General evidence for a tax rate effect on incorporation decisions in the United States is put forward by Gordon and MacKie-Mason (1994), MacKie-Mason and Gordon (1997), Goolsbee (1998 & 2004), Luna and Murray (2010), and most recently by Liu (2014).⁴²⁴ For Europe, the impact of tax rate differences between non-corporate and corporate businesses on legal form choice is documented by de Mooij and Nicodème (2008).⁴²⁵ We follow the general approach adopted in these studies and explain variation in aggregate corporate shares of business.

A further contribution of this study is that it informs about behavioral responses to compliance costs. While there is some international evidence on the approximate size of the compliance cost burden,⁴²⁶ the behavioral implications remain largely unknown. Previous studies consider behavioral responses to compliance costs mainly in terms of compliance it-

⁴²² See Graham/Harvey/Rajgopal (2005) pp. 3 ff.; Graham/Hanlon/Shevlin (2010) pp. 137 ff.

⁴²³ An early study by Wolfson (1985) analyzes special tax regimes for oil and gas firms. Elschner (2013), in contrast, analyzes the impact of tonnage taxes on the choice of legal form in the shipping industry while Edmark and Gordon (2013) investigate the choice of legal form by closely-held firms in Sweden under the specific incentives generated by the dual income tax. Goolsbee and Maydew (2002) consider the case of REIT spin-offs in the US. See Wolfson (1985) pp. 1 ff.; Goolsbee/Maydew (2002) pp. 441 ff.; Edmark/Gordon (2013) pp. 219 ff.; Elschner (2013) pp. 206 ff.

⁴²⁴ See Gordon/MacKie-Mason (1994) pp. 279 ff.; MacKie-Mason/Gordon (1997) pp. 477 ff.; Goolsbee (1998) pp. 143 ff.; Goolsbee (2004) pp. 2283 ff.; Luna/Murray (2010) pp. 995 ff.; Liu (2014) pp. 387 ff.

⁴²⁵ Further studies analyze legal form decisions of large publicly traded business organizations and find that taxes matter in the choice between publicly traded partnerships and corporations. See Guenther (1992), pp. 17 ff.; Shaw/Wier (1993) pp. 657 ff.; Terando/Omer (1993) pp. 23 ff.; Gentry (1994) pp. 223 ff. The tax factors driving corporate conversions from C-corporations to S-corporations have also been addressed. See Omer/Plesko/Shelley (2000) pp. 38 ff.; Hodder/McAnally/Weaver (2003) pp. 297 ff.; Bank/Cheffins (2008) pp. 111 ff.

⁴²⁶ For a comprehensive overview on international studies measuring the compliance cost burdens of both businesses and individuals, see Eichfelder (2010) pp. 53 ff. For a discussion of problems of measuring compliance costs, see Slemrod (1996) pp. 359 ff.; Tran-Nam/Evans/Walpole/Ritchie (2000) pp. 232 ff.

self.⁴²⁷ We know of no study that examines the response to compliance costs at other behavioral margins. Selection into eligibility for simplified tax accounting, by becoming or remaining non-corporate, would be one of the few empirical indications that compliance costs indeed affect economic decision-making. Moreover, knowing the size of the behavioral distortion that arises from selective eligibility for simplified tax accounting allows inferences on the tax compliance cost burden itself. In fact, our results reinforce previous estimates of the size of tax-related compliance costs ranging between 0.6% and 3.7% of taxable income.⁴²⁸

The structure of the paper is as follows. Section 5.2.2 presents theoretical considerations on the effect simplified tax accounting exerts on the choice of legal form. Section 5.2.3 provides an overview on simplified tax accounting in Europe and demonstrates our legal form data. The empirical analysis follows in Section 5.2.4 before Section 5.2.5 concludes.

5.2.2 *Theoretical Considerations*

Simplified tax accounting aims at approximating the standard tax base with a minimum of compliance effort. In the case of cash accounting, which is the most prevalent form of simplification, the difference compared to standard accrual accounting boils down to the mere timing of positive and negative income components, leaving total profits over time unaffected. Under cash accounting, transactions are recorded when cash is received or disbursed, whereas under accrual accounting receipts and expenses are realized as they accrue. However, provisions governing timing issues under accrual accounting are among the most difficult to put into practice. Granting relief from these complications, cash accounting can thus be highly advantageous in terms of compliance costs.⁴²⁹ This is especially true if it eliminates the need for a professional tax adviser, which is a major cost driver in tax compliance.⁴³⁰

On the other hand, accrual accounting with proper double-entry bookkeeping also has advantages. By accurately showing the ebb and flow of business income, it provides a clear picture of the financial status of the business to all its stakeholders. The benefits of accrual accounting also include better access to external finance, improved relations with cus-

⁴²⁷ See Hasseldine (2001) pp. 3 ff.; Erard/Ho (2003) pp. 93 ff.

⁴²⁸ See Blumenthal/Slemrod (1992) pp. 373 ff.; Slemrod (1996) pp. 355 ff.; Eichfelder (2010) pp. 53 ff.

⁴²⁹ See European Commission (2007b) p. 14.

⁴³⁰ See Allers (1995) pp. 181 ff.; OECD (2001b) pp. 50 ff.

tomers and suppliers, and the discovery of inefficiencies.⁴³¹ By choosing simplified accounting, the entrepreneur forgoes these benefits and thus incurs additional costs.⁴³²

In view of existing empirical evidence on tax complexity as a major driver of non-compliance,⁴³³ simplified tax accounting may also have consequences with respect to tax avoidance and evasion. On the one hand, simplified regimes eliminate accruals and the taxpayer's associated discretion. Hence, the opportunities for managing taxable income as well as the potential for unintentional underreporting could be reduced.⁴³⁴ In addition, complicated accounting regulations make it costly for the taxpayer to comply with reporting requirements.⁴³⁵ Decreasing the complexity of bookkeeping under simplified tax accounting and, at the same time, less expensive audits, could therefore curb cost-driven evasion behavior. On the other hand, with self-preparation of tax records becoming easier and the need for professional preparation services being reduced accordingly, the tax advisor as an important 'enforcement instance', who corrects misunderstandings, reminds of specific obligations, and explicitly warns against deliberate or inadvertent non-compliance, may fall away.⁴³⁶ In addition, there could be greater scope for tax evasion if businesses have employees whose income tax deductions and social security contributions need to be accounted for properly. Whether, on balance, simplified tax accounting can be considered as a compliance enhancing factor or a regime that enables non-compliance and is for this latter reason sought by some taxpayers, remains a priori an open question.

After all, under the theory of organizational choice by Scholes and Wolfson (1987), the legal form is chosen to minimize tax costs and transaction costs, including expenses incurred for bookkeeping, record-keeping, and data-processing.⁴³⁷ Non-tax benefits of incorporation are limited liability, increased liquidity of equity and enhanced diversification opportunities on the investors' part. Agency costs arising from the separation of management and

⁴³¹ See Sandford/Godwin/Hardwick (1989) pp. 13 f.; Chattopadhyay/Das-Gupta (2002) p. V.; Carter (2007) pp. 74 f.

⁴³² We acknowledge that benefits and costs of choosing simplified tax accounting will probably be negligible if commercial law requires drafting financial accounts on the basis of double-entry bookkeeping anyway. The liberal professions and many small non-corporate firms, however, are not subject to the commercial code in most countries. Even if the commercial code applies, requirements to draft commercial accounts are generally harmonized with the tax provisions on simplified accounting.

⁴³³ See Richardson (2006) pp. 150 ff.

⁴³⁴ See Boynton/Dobbins/Plesko (1992) pp. 131 ff.

⁴³⁵ See Krause (2000) pp. 395 ff.

⁴³⁶ See OECD (2013c) pp. 254 f.; Kittl (2015) pp. 231 ff.

⁴³⁷ See Scholes/Wolfson (1987) pp. 1 ff.

control may be the negative side to that.⁴³⁸ With respect to tax considerations, previous evidence suggests that the difference between personal and corporate income tax rates affects legal form decisions.⁴³⁹ Notwithstanding these non-tax factors and tax-rate considerations, entrepreneurs who value the benefits of simplified tax accounting highly will opt against incorporation as only the non-corporate form permits to enjoy simplified accounting. Simplified tax accounting thus introduces a potentially relevant distortion in the choice of legal form. If the benefit of simplified tax accounting is sufficiently high for at least some firms to choose an otherwise less preferable legal form, simplified tax accounting for non-corporate firms should empirically influence the corporate share of business activity.

In the empirical analysis, we will test this conjecture by estimating the degree to which the allocation of business activity across legal forms in 27 European economies has responded to changes in eligibility thresholds for simplified tax accounting.

5.2.3 *Institutional Background and Data*

5.2.3.1 *Overview of Simplified Tax Accounting in Europe*

Providing regimes of simplified tax accounting is common practice in Europe. In all, 19 out of 27 sample countries offered reliefs from comprehensive accrual accounting to small non-corporate enterprises in 2010 (see Table 28 for an overview). Most of these regimes build on cash-basis accounting. As a consequence, eligible enterprises do not have to account for balance sheet items such as provisions, accrued expenses, and deferred income – the items requiring the highest degree of accounting literacy.⁴⁴⁰ They should therefore cause the highest compliance burden as proper handling is time-consuming and might even entail the hiring of a professional tax adviser. Using cash-basis accounting, business owners can refer to actual in- and outflows, which are substantially easier to keep track of – for both the taxpayer as well as tax administrations. Furthermore, simplified regimes often come along with reduced formal requirements for enterprises. Eligible businesses, for example, do not have to draw up a balance sheet or an inventory. The majority of simplified regimes, however, demand some adjustments to the purely cash-based determination of income. Periodization according to accu-

⁴³⁸ See Fama/Jensen (1983a) pp. 301 ff.; Fama/Jensen (1983b) pp. 327 ff.

⁴³⁹ See MacKie-Mason/Gordon (1997) pp. 477 ff.; Goolsbee (1998) pp. 143 ff.; Goolsbee (2004) pp. 2283 ff.

⁴⁴⁰ See European Commission (2007b) pp. 14 ff.

al principles occurs in particular with respect to the depreciation of fixed assets and prepayments (e.g. in France, Germany, Greece).

On the other hand, some countries do not only provide the opportunity to account for profits on a cash basis but even relieve taxpayers from recording some kinds of expenses (e.g. Austria, Bulgaria, Spain). Under these regimes, certain lump-sum percentages of turnover are deducted to arrive at net income before taxes.

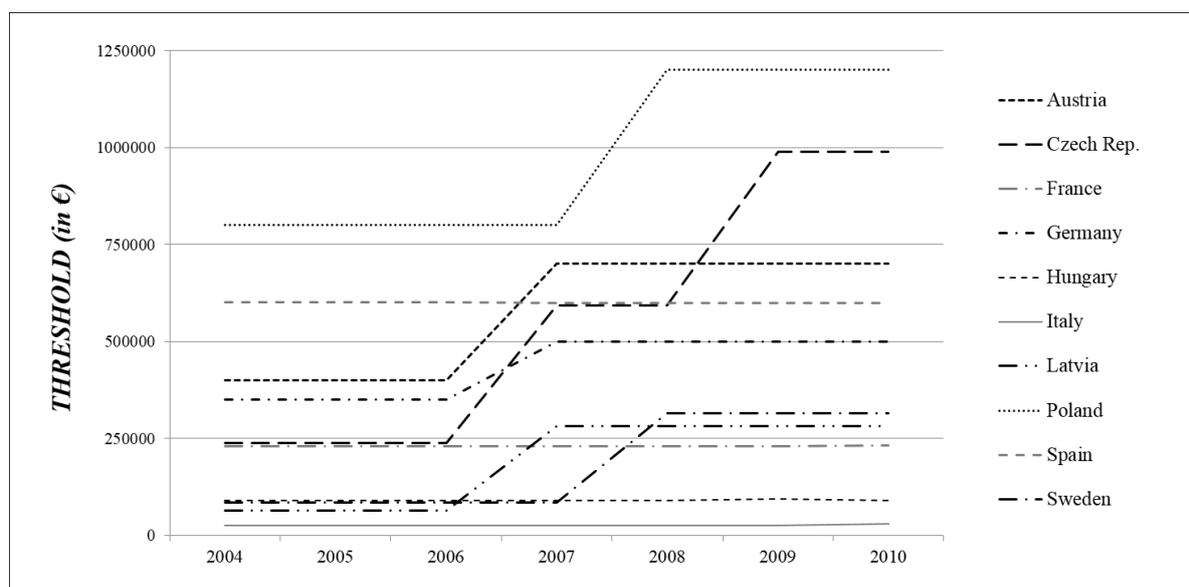
Table 28: Regimes of simplified tax accounting in Europe (2004–2010)

Country	Accrual relief	Threshold in € (2004)	Threshold in € (2010)	Industry differentiation	Further simplifications
Austria	yes	400,000	700,000	no	yes
Belgium	yes	500,000	500,000	no	yes
Bulgaria	yes	25,565	25,565	yes	yes
Cyprus	no	-	-	yes	no
Czech Republic	yes	237,304	988,768	no	yes
Denmark	no	-	-	-	-
Estonia	yes	none	none	no	no
Finland	no	-	-	-	-
France	yes	230,000	231,000	yes	yes
Germany	yes	350,000	500,000	no	no
Greece	yes	1,500,000	1,500,000	no	yes
Hungary	yes	90,751	90,751	no	yes
Ireland	no	-	-	-	-
Italy	yes	25,823	30,000	-	-
Latvia	yes	63,497	282,207	no	yes
Luxembourg	no	50,000	50,000	no	no
Malta	no	-	-	-	-
Netherlands	no	-	-	-	-
Norway	no	-	-	-	-
Poland	yes	800,000	1,200,000	no	yes
Portugal	yes	99,760	99,760	yes	yes
Slovakia	yes	35,000	35,000	no	yes
Slovenia	yes	42,000	42,000	no	yes
Spain	yes	601,012	600,000	no	yes
Sweden	no	83,881	314,554	no	no
Switzerland	no	-	-	-	-
United Kingdom	no	-	-	-	-

Notes: *Accrual relief* indicates, whether the respective countries apply some sort of simplified regime of tax accounting that provides for major reliefs from accrual accounting during the sample period. The information is taken from the International Bureau of Fiscal Documentation (IBFD) and national tax codes. *Threshold in € (2004)* and *Threshold in € (2010)* present applicable turnover thresholds up to which simplified accounting can be applied in the first and last years of the sample period for firms engaged in personal service activities. *Industry differentiation* reports whether turnover thresholds vary across industries in a country. *Further simplifications* indicate the availability of simplifications going beyond a change from the accrual to the cash basis (i.e., presumptive elements).

Simplified regimes of tax accounting are generally available for non-corporate entities only (i.e., businesses whose income is subject to the personal income tax). A striking difference between countries, however, relates to the scope of eligible businesses as size restrictions vary substantially.⁴⁴¹ Bulgaria, for example, only offers relief to businesses with less than € 25,565 of turnover, whereas the Estonian and Polish tax codes are much more generous. The majority of countries implement turnover thresholds between € 50,000 and € 1,000,000.

Figure 12: Development of turnover thresholds for simplified tax accounting (2004–2010)



Notes: The figure displays turnover thresholds restricting eligibility for simplified tax accounting. Only countries with changes in thresholds during the sample period 2004–2010 are included in the graph.

Importantly, in ten out of 19 countries thresholds have changed within the sample period, i.e., between 2004 and 2010 (see Figure 12). Some countries only implemented minor changes (France, Hungary, Italy, Spain), whereas other countries have substantially extended the scope of application of their simplified regimes in 2007 (Austria, Czech Republic, Germany, Latvia) and in 2008 (Poland, Sweden). While the turnover thresholds may appear low, they cover the vast majority of businesses in most countries. In Germany, for example, more

⁴⁴¹ We refer to turnover thresholds in the comparison of size restrictions for simplified accounting across countries and use it for identification in the empirical analysis because turnover is the central eligibility criterion all simplified accounting regimes have in common. Some countries, however, employ complementary criteria, e.g., the number of employees or taxable income. We expect potential error from neglecting complementary country-specific criteria to be small and non-systematic.

than 80% of all businesses would be eligible for simplified tax accounting in 2010.⁴⁴² The determination of eligibility is generally based on last year's turnover and a switch back to simplified rules is possible once turnover has fallen below the threshold. Austria and Germany take into account the two years preceding the respective fiscal period.

Interestingly, some countries also discriminate between industries, i.e., they only offer simplified tax accounting to certain economic sectors (Bulgaria, Cyprus) or they have different thresholds in place for the manufacturing and service sectors (France, Portugal). Legal obligations to keep financial accounts, if at all existent for sole proprietors, are generally harmonized with the eligibility for simplified tax accounting. Hence, businesses do not face financial accounting requirements beyond those from the tax code.

5.2.3.2 *Legal Form Data*

The data on the distribution of legal forms comes from Eurostat's Business Demography. This database provides data on the number of active firms and the number of persons employed aggregated at 2-digit NACE industry levels⁴⁴³ for 30 European countries.⁴⁴⁴ Our data comprise seven years from 2004 to 2010 and distinguish the following legal forms:

- *Sole proprietorships*: personally owned firms with unlimited personal liability;
- *Corporations*: private or publicly quoted joint stock companies with limited liability for those owning shares; and
- *Personally owned limited or unlimited liability partnerships* and other forms such as co-operatives and associations.

We calculate the non-corporate share of business as the number of sole proprietorships divided by the sum of sole proprietorships and corporations. The calculation of the non-corporate employment share is done accordingly. The partnership category contains corporately taxed entities as well as transparently taxed firms. A clear assignment to either the non-

⁴⁴² See Statistisches Bundesamt (2016) p. 9.

⁴⁴³ In 2008, the industry classification was redefined from NACE 1.1 to NACE 2.0. We apply the conversion scheme described in Table A8 in the appendix to arrive at consistent industry groupings for all years.

⁴⁴⁴ For the empirical analysis, Romania and Lithuania are excluded from the sample as sole proprietorships were not adequately covered in these countries. See Eurostat: http://epp.eurostat.ec.europa.eu/cache/ITY_SDDS/An nexes/bd_esms_an1.pdf (retrieved on March 14, 2014). Turkey is dismissed due to missing information on simplified accounting.

corporate or the corporate sector and thus to either simplified or non-simplified tax accounting cannot be made. We therefore exclude partnerships from our standard measures of non-corporate shares but will address the issue in the robustness checks of our analysis.

Table 29: Non-corporate shares of business by country (2004–2010)

Country	Non-corporate share (%)		Country	Non-corporate share (%)	
	Nr. of firms	Employment		Nr. of firms	Employment
Austria	79.0	33.7	Latvia	37.4	6.6
Belgium	44.2	11.9	Luxembourg	24.9	8.2
Bulgaria	52.7	20.5	Malta	71.5	25.6
Cyprus	49.9	16.2	Netherlands	67.9	14.0
Czech Rep.	82.5	27.7	Norway	49.1	10.0
Denmark	56.6	16.3	Poland	93.8	49.7
Estonia	27.6	4.6	Portugal	69.7	25.5
Finland	54.4	6.6	Slovakia	77.5	33.9
France	55.2	28.0	Slovenia	63.3	22.3
Germany	79.1	28.0	Spain	60.3	22.9
Greece	93.2	51.3	Sweden	54.8	13.2
Hungary	62.5	21.6	Switzerland	57.2	20.0
Ireland	50.8	17.2	UK	29.6	7.4
Italy	79.1	32.6	<i>Average</i>	<i>60.1</i>	<i>21.3</i>

Notes: The non-corporate share of business is the average ratio of the number of sole proprietorships on the number of all firms (excluding partnerships) throughout the sample period (2004–2010). Alternatively, the non-corporate share of business is the average ratio of people employed in sole proprietorships on the number of people employed in all firms (excluding partnerships) throughout the sample period (2004–2010).

Table 29 presents overall shares of sole proprietorships per country in the sample. Shares in employment are significantly lower than in the number of establishments during the sample period (60.1% vs. 21.3%). This is in line with previous literature showing bigger entities to be more likely to incorporate than small firms. Moreover, large differences across countries can be observed. While 93.8% of Polish firms have not incorporated, the corresponding rate in Luxembourg amounts to only 24.9%. Table 30 reports the share of sole proprietorships by industry. Again, the percentage is much smaller for employment than for the number of firms. The highest shares occur in the service and retail sectors, where firms tend to be small.

Table 30: Non-corporate shares of business by industry

Industry	Non-corporate share (in %)	
	Nr. of firms	Employment
Manufacturing	50.6	13.2
Utilities	31.9	3.7
Construction	63.9	29.1
Retail	62.8	29.8
Hotels and restaurants	65.2	36.5
Transport, storage & telecommunications	61.7	19.0
Real estate	36.5	20.7
Professional and scientific services	61.8	35.2
Other service activities	57.9	23.3

Notes: The non-corporate share of business is the average ratio of the number of sole proprietorships on the number of all firms (excluding partnerships) throughout the sample period (2004–2010). Alternatively, the non-corporate share of business is the average ratio of people employed in sole proprietorships on the number of people employed in all firms (excluding partnerships) throughout the sample period (2004–2010).

5.2.4 Empirical Analysis

5.2.4.1 Baseline Results

Our considerations in Section 5.2.2 suggest that simplified accounting can lead entrepreneurs to prefer the non-corporate form over the incorporated form of business. Ideally, firm-level data that is representative of the business population across legal forms would lend itself for a regression discontinuity analysis with incorporation as a binary outcome and turnover as the assignment variable. With treatment determined by whether turnover falls below the eligibility threshold for simplified tax accounting, one could estimate the effect of the simplified regime on the choice of legal form around this cutoff. However, due to differences in publication requirements between legal forms, available firm-level data usually has a strong bias towards corporate entities and in particular small non-corporate entities are clearly underrepresented. Consequently, we follow previous studies on organizational form choice and resort to aggregate data on the shares of legal forms in the business population for our empirical analysis (see Section 5.2.3).

The question of interest is whether the proportion of non-corporate business is influenced by non-corporate firms' eligibility for simplified tax accounting. Considering our international legal form data, this setting calls for a difference-in-differences (DiD) approach. Specifically, we estimate the effect of variation in eligibility thresholds for simplified tax accounting by comparing the change in countries' non-corporate shares of business before and

after a threshold change relative to the change in non-corporate shares of business in countries with a constant regime. After an increase in the eligibility threshold the non-corporate share of business should increase relative to the control group with constant regimes if, at least for some of the eligible firms, the benefit of simplified accounting outweighs the gains from incorporation.

Although most previous empirical studies analyzing the choice of legal form use the same type of aggregate data,⁴⁴⁵ it admittedly has some drawbacks. In particular, not all firms that constitute the business population reflected in our aggregate data are affected by the changes in eligibility thresholds for simplified accounting. Specifically, a considerable number of firms will feature turnover either substantially below the old threshold or above even the new threshold. Still, we will focus our empirical analysis on major shifts in eligibility thresholds of at least 20% that will affect an important share of business populations, especially in view of the fact that enterprises with up to € 1 million of turnover represent 92.7% of all businesses in the European Union (European Commission, 2015).⁴⁴⁶ As is shown in Section 5.2.3, there are six countries in the sample that increased turnover thresholds for simplified tax accounting substantially.

Along these lines, Figure 13 plots the difference between the non-corporate share of business in treatment and control countries for a period ranging from two years before to two years after the reforms that occurred during our sample period. Specifically, the non-corporate share of business, averaged across industries, is determined separately for each year and each treatment country before subtracting the corresponding non-corporate share in the control group of countries and, finally, averaging these differences across the six threshold increase events.

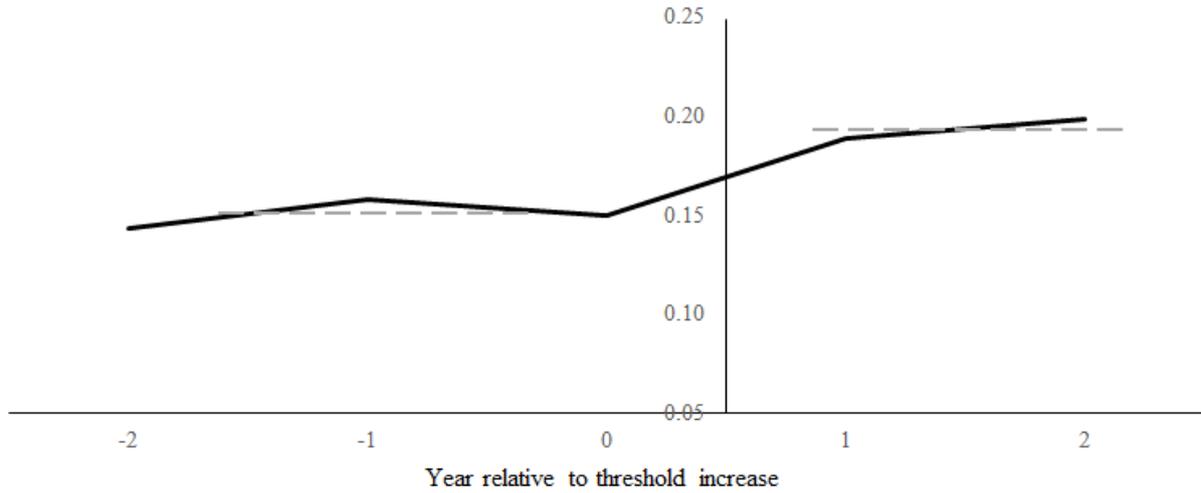
Figure 13 shows no apparent trend in the difference between treatment and control group in the two years prior to a threshold change. After a reform, however, average non-corporate shares of business in treatment and control group diverge by 0.044 (t-value: 7.06), i.e., the non-corporate share in treatment countries increases relative to the countries in the control group when the eligibility threshold increases. It appears that the proportion of non-

⁴⁴⁵ See Gordon/MacKie-Mason (1994) pp. 279 ff.; MacKie-Mason/Gordon (1997) pp. 477 ff.; Goolsbee (1998) pp. 143 ff.; Goolsbee (2004) pp. 2283 f.; De Mooij/Nicodème (2008) pp. ff.; Liu (2014) pp. 478 ff.

⁴⁴⁶ See European Commission (2015a) p. 3.

corporate business is indeed influenced by the scope of eligibility for simplified tax accounting.

Figure 13: Difference in development of non-corporate shares in treatment and control countries



Notes: The figure displays the average difference between the non-corporate share of business in treatment and control countries for a period ranging from two years before to two years after the respective reforms that occurred during our sample period. Specifically, the non-corporate share of business, averaged across industries, is determined separately for each year and each treatment country before subtracting the corresponding non-corporate share in the control group of countries and averaging these differences across six major threshold increase events.

Complementing the visual evidence, we estimate the regression formulation of our difference-in-differences approach that compares the development of non-corporate shares in countries experiencing an extension of eligibility for simplified tax accounting to the countries with no reform during the sample period:

$$NONCORP_{i,j,t} = \beta_0 + \beta_1 POST_INCREASE_{i,j,t} + \beta_2 TREAT_{i,j,t} + \beta_3 POST_{i,j,t} + \varepsilon_{i,j,t} \quad (1)$$

The dependent variable *NONCORP* is the non-corporate share of business, as defined in Section 5.2.3, in country *i* and industry *j* in year *t*. The dummy variable *TREAT* equals one if the turnover threshold for simplified tax accounting increases by at least 20% during the sample period in the respective country-industry cell and it is zero otherwise. *POST* is a time dummy distinguishing pre- and post-treatment observations. It switches from zero to one in the year of the reform. The main variable of interest is *POST_INCREASE* which is a dummy that equals one if the respective country-industry cell has experienced an increase in the turnover threshold for simplified accounting by year *t*, and zero otherwise. In other words, *POST_INCREASE* is the interaction of the variables *TREAT* and *POST* in equation (1). Its estimated coefficient $\hat{\beta}_1$ will measure the average treatment effect of extended eligibility for simplified tax accounting on the non-corporate share of business.

Table 31: Eligibility for simplified tax accounting and non-corporate shares of business (baseline results)

	2007 reforms		2008 reforms		All reforms: 2010 vs. 2004		All reforms: All sample years		Distributed lag model	
	Baseline D-I-D	Baseline D-I-D	Baseline D-I-D	+ Country & industry dummies	+ Time-variant controls	+ Country-industry fixed effects	One lag	Two lags		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)		
$POST_INCREASE_t$	0.037*** (0.008)	0.060*** (0.015)	0.071*** (0.010)	0.038*** (0.008)	0.025*** (0.006)	0.026*** (0.005)	0.022*** (0.005)	0.016*** (0.005)		
$POST_INCREASE_{t-1}$							0.006 (0.005)	-0.002 (0.004)		
$POST_INCREASE_{t-2}$									0.014*** (0.003)	
$TREAT$	0.118*** (0.023)	0.180*** (0.031)	0.124*** (0.020)							
$POST$	-0.059*** (0.005)	-0.062*** (0.006)	-0.087*** (0.006)	-0.064*** (0.005)						
Constant	0.474*** (0.009)	0.467*** (0.009)	0.490*** (0.009)	0.712*** (0.025)	3.181*** (0.361)	2.842*** (0.302)	2.832*** (0.304)	2.411*** (0.320)		
Country dummies				✓	✓					
Industry dummies				✓	✓					
Country-industry FE						✓	✓	✓		
Year dummies					✓	✓	✓	✓		
Additional Controls					✓	✓	✓	✓		
Long-run effect							0.027*** (0.006)	0.028*** (0.006)		
Observations	6,469	5,857	2,106	2,106	7,030	7,030	7,030	6,016		
R^2_{adj}	0.049	0.063	0.083	0.745	0.752	0.132	0.132	0.100		

Notes: The dependent variable is the non-corporate firm share which equals the number of sole proprietorships divided by the number of all firms (excluding partnerships). *POST_INCREASE* is a dummy variable that takes the value 0 if the eligibility threshold for simplified tax accounting in the respective country-industry cell has not been increased by at least 20% compared to the base year (2004) and the value 1 otherwise. *TREAT* is a dummy variable that takes the value 1 for treatment countries and 0 for countries of the control group. *POST* is a dummy variable that takes the value 0 for pre-treatment years and 1 for post-treatment years. Regressions (1)–(5) are from OLS estimation and regressions (6)–(8) are from fixed effects (within) regression. Additional controls include *TAX*, *GNIC*, *MINCAP* and *UNEMP*. Explanatory variables are defined as given in Table A5 in the appendix. Standard errors clustered at the country-industry level are given in parentheses; *, **, *** represent significance levels of 10%, 5%, and 1%, respectively.

As shown in Section 5.2.3, our setting contains events in six countries, which can be divided into two groups based on the timing of the treatment: countries extending eligibility for simplified accounting in 2007 (Austria, Czech Republic⁴⁴⁷, Germany and Latvia) and countries doing so in 2008 (Poland and Sweden). In columns (1) and (2) of Table 31, we separately estimate equation (1) for threshold changes, that is, treatments, respectively in 2007 and 2008. Thus, observations in the treatment group underlying results in column (1) of Table 31 are from Austria, Czech Republic, Germany and Latvia, whereas the treatment underlying column (2) occurred in Poland and Sweden. In both regressions, control group observations are from countries with no threshold change throughout the sample period. The estimated coefficients of *POST_INCREASE* of 0.037 and 0.060 are significant at 1% confidence, respectively in columns (1) and (2). These results reflect the graphical evidence from Figure 13.

Next, we would like to evaluate all reforms in one regression. Still referring to the above baseline DiD equation (1), we reduce the sample to the first and the last year of our observation period, that is, 2004 and 2010, in column (3) of Table 31. This approach enables a uniform definition of pre-treatment period (2004) and post-treatment period (2010) for all six natural experiments no matter when exactly reforms were implemented during that time period. At the same time, it reflects a rather long-term response and is less sensitive to short-term dynamics. The estimated coefficient of *POST_INCREASE* again turns out positive and significant at all conventional significance levels.

Specifications in columns (1) to (3) of Table 31 are supposed to capture differences between control and treatment groups by the binary treatment group dummy (*TREAT*). However, as thresholds for simplified tax accounting are set by the individual countries, unobserved country characteristics could be the source of omitted variable bias potentially con-

⁴⁴⁷ The Czech Republic increased eligibility twice (in 2007 and 2009). Following Valta (2012), we assign the treatment to 2007, which is the first as well as the larger increase of the threshold. See Valta (2012) p. 671.

founding the estimates in previous regressions. Such unobserved factors may include the legal and accounting tradition of a country as well as the state of development of capital markets or the availability of certain hybrid legal forms. Besides country-level influences, industry-specific conditions may drive corporate and non-corporate shares of business. For example, the benefit of incorporation is higher in industries where firms are larger and face greater diversifiable risk.⁴⁴⁸ We therefore proceed by extending the baseline estimation equation (1) and add full sets of country dummies and industry dummies in column (4) of Table 31. Relative to specification (3), the estimated coefficient of *POST_INCREASE* drops by almost one half to 0.038 but remains statistically significant at 1% confidence.

Next, we analyze all the observations in our data set at once and estimate the difference-in-differences approach on our full sample with seven years of data from 2004 to 2010 and with all treatments in 2007 and 2008. Therefore, we extend the baseline difference-in-differences set-up to a more generalized DiD approach.⁴⁴⁹ Specifically, we now use a full set of year dummies instead of the single binary variable *POST* to control for aggregate fluctuations. Furthermore, additional time-variant variables enter the equation in column (5) of Table 31 to control for otherwise omitted factors and country-specific trends. Importantly, we control for the difference between the statutory top personal and the corporate income tax rate which according to previous empirical evidence affects the proportion of incorporated firms.⁴⁵⁰ As incorporation goes along with limited liability, company laws in most countries require a certain minimum capital for corporate entities. Raising (lowering) the required amounts of capital complicates (facilitates) incorporation for small businesses. We therefore include the minimum capital requirement as a further control variable in the regression. To control for business cycle effects on the non-corporate share of business, we also include the logarithm of gross national income per capita and the unemployment rate. Descriptive statistics for these variables are provided in Table 31. Specification (5) of Table 31 additionally controls for these time-variant factors and yields an estimated coefficient of *POST_INCREASE* of 0.025 that is significant at all conventional levels.

⁴⁴⁸ See Fama/Jensen (1983a) pp. 301 ff.; Fama/Jensen (1983b) pp. 327 ff.

⁴⁴⁹ See Bertrand/Mullainathan (2003) pp. 1043 ff.; Valta, (2012) pp. 670 ff.

⁴⁵⁰ See Gordon/MacKie-Mason (1994) pp. 279 ff.; MacKie-Mason/Gordon (1997) pp. 477 ff.; Goolsbee (1998) pp. 143 ff.; Goolsbee (2004) pp. 2283 f.; De Mooij/Nicodème (2008) pp. 478 ff.; Liu (2014) pp. 387 ff.

Table 32: Eligibility for simplified tax accounting and non-corporate shares of business (control variables)

Country	TAX (% points)	GNIC (\$)	MINCAP (€)	UNEMP (in %)	COMPLEX
Austria	5.24	38,506	35,000	4.60	0 (170)
Belgium	17.36	36,456	18,550	7.96	0 (156)
Bulgaria	1.82	12,323	2,186	8.64	1 (616)
Cyprus	5.89	29,570	0	4.76	0 (149)
Czech Republic	-9.97	23,529	7,910	6.71	1 (557)
Denmark	0.14	38,280	15,921	4.99	0 (135)
Estonia	0.00	18,486	2,556	9.24	0 (81)
Finland	12.01	36,091	4,071	7.79	0 (243)
France	7.90	33,711	0	8.67	0 (132)
Germany	-4.49	36,169	25,000	8.94	0 (215)
Greece	10.70	27,666	14,143	9.60	0 (224)
Hungary	-5.35	18,253	7,556	8.17	1 (277)
Ireland	-5.79	36,789	0	7.10	0 (76)
Italy	5.61	32,557	10,000	7.34	1 (285)
Latvia	0.36	16,549	1,983	10.69	0 (253)
Luxembourg	-2.94	58,071	12,395	4.71	0 (59)
Malta	0.00	22,791	1,165	6.83	-
Netherlands	10.05	42,047	18,000	3.87	0 (134)
Norway	-0.86	54,524	12,493	3.47	0 (87)
Poland	-3.31	16,289	9,298	12.14	1 (325)
Portugal	0.44	23,663	5,000	8.27	1 (298)
Slovakia	0.00	19,981	5,000	13.53	0 (257)
Slovenia	4.04	26,057	7,500	5.87	1 (260)
Spain	1.96	30,421	3,005	12.34	0 (197)
Sweden	7.28	39,567	9,736	7.20	0 (122)
Switzerland	-5.38	47,100	14,490	4.04	0 (63)
United Kingdom	0.17	36,466	0	5.83	0 (110)

Notes: All data are for 2010. *TAX* shows the tax rate differential (here shown in %-points) of the top marginal personal income tax rate on business income and the overall corporate income tax rate including dividend taxation on income from small corporations. *GNIC* per capita shows the gross national income per capita. *MINCAP* captures the statutory capital requirements (here scaled in €) for corporate entities. *UNEMP* captures the unemployment rate (here shown in %) in the sample period. All numbers are given as averages during the sample period. *COMPLEX* is a dummy variable indicating how laborious preparing tax returns and paying corporate taxes in a country is. It takes the value 1 if more than the median amount of time is required by taxpayers and 0 if not (underlying values according to statistics provided by the World Bank are given in brackets).

Finally, we fully exploit the panel structure of our data and control for individual country-industry fixed effects in column (6) of Table 31 and thus arrive at the regression equation

$$NONCORP_{i,j,t} = \beta_0 + \beta_1 POST_INCREASE_{i,j,t} + \gamma x_{i,t} + \phi_{i,j} + \delta_t + \varepsilon_{i,j,t} \quad (2)$$

where the vector x includes the time-variant country-level controls and δ_t is a year-fixed effect. The country-industry fixed effects ($\phi_{i,j}$) nest both the country dummies and the industry dummies previously included and capture the influence of time-constant country-industry-level factors on the propensity to incorporate. The estimated coefficient of *POST_INCREASE* amounts to 0.026 and is highly statistically significant.

Given the influence of simplified tax accounting on the choice of legal form, the last specifications (7) and (8) of Table 31 examine the timing of non-corporate shares' reaction to increased eligibility for simplified tax accounting in more detail. We therefore estimate distributed lag models with one lag of *POST_INCREASE* in column (7) and with two lags of *POST_INCREASE* in column (8) of Table 31. Considering the results, the coefficient of the contemporaneous variable in column (7) is highly significant and positive whereas the lagged effect is found to be positive but insignificant. By contrast, the model with two lags in column (8) yields significant positive coefficients for both the contemporaneous effect and the two-year lag while the coefficient for the one-year lag remains statistically insignificant. All in all, the distributed lag models give some evidence for the shift in the non-corporate share to materialize over multiple years after the reform. Given the substantial multi-collinearity between the contemporaneous variable and its lags, however, estimating the effect at each lag precisely is generally difficult.⁴⁵¹ Still, in both models the estimated long-term response as given by the sum of the estimated coefficients of *LN_THRESHOLD* and its lags is highly statistically significant and respectively amounts to 0.027 in column (7) and 0.028 in column (8) of Table 31. As this is generally consistent with our previous results, we are confident that the static model used in previous regressions adequately captures the response.

5.2.4.2 *Refined Measurement of the Treatment Effect and Cross-Sectional Tests*

The regressions so far used the binary variable *POST_INCREASE* to identify the effect of an extension of eligibility for simplified tax accounting on the non-corporate share of business. To be able to make some more precise and nuanced statements about the marginal effect of an increase in turnover thresholds, we refine our main explanatory variable and substitute the dummy *POST_INCREASE* with a continuous variable *THRESHOLD* that directly reflects the applicable turnover thresholds (scaled in million euro). In all other respects, we stick to our generalized specification (column (6), Table 31) that controls for time-constant

⁴⁵¹ See Wooldridge (2013) p. 346.

confounding factors at the country-industry level, captures aggregate fluctuations via year fixed effects and includes a set of additional time-varying covariates as potential sources of omitted country-specific trends.

Considering the results, the estimated coefficient of 0.047 in column (1) of Table 33 means that, for example, an increase of turnover thresholds by € 340,000, which is about the average threshold increase in the reform countries, is expected to lead to an increase in the non-corporate share of business by 1.6 percentage points. Adjusting eligibility thresholds for inflation in column (2) of Table 33 does not alter our findings substantially.

Specifications (1) and (2) in Table 33 assume that the effect of a change in *THRESHOLD* on the non-corporate share of business is constant. Given the skewed size distribution of enterprises, however, the effect likely flattens out for higher initial thresholds, i.e., an increase from € 200,000 to € 300,000 has more of an impact than a change from € 1 million to € 1.1 million. Moreover, larger firms might be less inclined to respond to the benefits arising from simplified accounting due to non-tax benefits associated with incorporation. Hence, we continue onwards using turnover thresholds in logs in column (3) of Table 33. The specification yields a positive and significant coefficient of 0.013 for *LN_THRESHOLD*. Taken at face value, this result implies that a 1% increase in the eligibility threshold is associated with a 0.013 percentage point increase in the non-corporate share of business.

Next, we investigate whether the responsiveness of the corporate firm share to changes in eligibility thresholds varies with the general complexity of the tax system. Specifically, we expect accounting simplifications to be more attractive when the alternative ‘ordinary’ regime is rather complex. For this cross-sectional test, we construct a dummy variable *COMPLEX* that marks countries with complex tax systems. *COMPLEX* equals one for countries where the time to comply with relevant tax rules, according to the World Bank, is above the sample median and zero otherwise. The underlying World Bank indicator approximates how many hours per year a domestic model corporation needs for the preparation of its tax returns and the actual payment of all relevant taxes. It reflects the time required to collect information, prepare separate mandatory tax accounting books, complete and file tax returns with proper agencies and arrange payment or withholding. We include *COMPLEX* in our regression and interact it with *LN_THRESHOLD*. As shown in column (4) of Table 33, the coefficient of the interaction between *LN_THRESHOLD* and *COMPLEX* indeed proves statistically significant and positive. Hence, the relief provided by simplified tax accounting in-

creases in the complexity of the ordinary procedures of determining and paying taxes. This result corroborates the notion of simplified accounting regimes affecting the choice of legal form primarily through a reduction in compliance costs.

Table 33: Eligibility for simplified tax accounting and non-corporate shares of business (refined measurement)

	Eligibility threshold (1)	Inflation-adj. threshold (2)	Log threshold (3)	Tax complexity (4)
<i>THRESHOLD</i>	0.047*** (0.016)			
<i>THRESHOLD_INFL</i>		0.046** (0.018)		
<i>LN_THRESHOLD</i>			0.013** (0.005)	0.005 (0.006)
<i>LN_THRESHOLD#COMPLEX</i>				0.005*** (0.001)
<i>COMPLEX</i>				0.022* (0.013)
Constant	2.756*** (0.305)	2.740*** (0.306)	2.946*** (0.317)	2.345*** (0.346)
Year dummies	✓	✓	✓	✓
Country-Industry FE	✓	✓	✓	✓
Additional controls	✓	✓	✓	✓
Observations	7,030	7,030	7,030	5,807
R ² _{adj}	0.127	0.126	0.126	0.099

Notes: The dependent variable is the non-corporate firm share which equals the number of sole proprietorships divided by the number of all firms (excluding partnerships). All regressions control for country-industry fixed effects (within estimation) and a full set of year dummies. *THRESHOLD* is the turnover threshold up to which non-corporate enterprises are eligible for simplified tax accounting (in million euro). *LN_THRESHOLD* is the natural logarithm of *THRESHOLD*. *COMPLEX* is a dummy variable that takes the value 1 if the required time to prepare tax returns and pay taxes in a country exceeds the respective sample median and 0 otherwise. Additional controls include *TAX*, *GNIC*, *MINCAP* and *UNEMP*. These variables are defined and scaled as given in Table A5 in the appendix. Full regression results including the coefficients for all control variables are provided in Table A6 in the online appendix. Standard errors clustered at the country-industry level are given in parentheses; *, **, *** represent significance levels of 10%, 5%, and 1%, respectively.

After all, the regressions in Tables 31 and 33 provide robust evidence of a statistically significant effect of changes in eligibility thresholds for simplified tax accounting on the non-corporate share of business. This is consistent with eligible enterprises responding to the incentives that arise from simplified tax accounting with respect to their choice of legal form. Using the results from Table 33, we can now illustrate the economic size of the effect.

To this aim, we take the introductory example of the United Kingdom (see Section 5.2.1) and carry out some back-of-the-envelope calculations. The country recently launched a

new regime of simplified tax accounting for non-corporate entities with turnover up to £ 77,000 (€ 96,500). Taking our results from column (1) of Table 33, the share of sole proprietorships is predicted to increase *ceteris paribus* by about 0.45 percentage points in response.⁴⁵² However, only about 40% of registered enterprises fall below the turnover threshold of £ 77,000. Consistently, the non-corporate share of firms in that specific segment of the UK business population should *ceteris paribus* increase by 1.1 percentage points (= $0.0045/0.40$) in response to the new regime. Hence, with respect to this UK scenario, our results suggest that per one hundred firms within the scope of eligibility for simplified tax accounting about one business that would incorporate absent simplified accounting now decides against incorporation.

In addition, let us compare this response to the tax rate effect on legal form choice and calculate an equivalent change in the tax rate differential between non-corporate and corporate firms. Using the consensus tax semi-elasticity of the corporate share of business of 0.7 reported by de Mooij and Ederveen (2008)⁴⁵³, our results suggest that the effect from the introduction of simplified tax accounting up to the turnover threshold of € 96,500 is equivalent to a 0.9 percentage point decrease in the tax rate difference between non-corporate and corporate firms.⁴⁵⁴ In other words, the estimated response of the corporate firm share to the new scheme of simplified accounting in the UK reflects an incentive not to incorporate which is equivalent to a *ceteris paribus* cut in the top personal tax rate by 0.9 percentage points. Interestingly, this rough estimate is consistent with previous estimates of the relative tax compliance cost burden, ranging between 0.6% and 3.7% of taxable income.⁴⁵⁵

⁴⁵² The response is calculated as follows: $0.0045 = 0.047 * \text{EUR } 96,500 / \text{EUR } 1,000,000$. The *THRESHOLD* coefficient of 0.047 is taken from Table 33, column 1 (*THRESHOLD* is scaled in million euro). The data on size intervals of the business population in the UK are available from the Office for National Statistics. See Office of National Statistic: <http://www.ons.gov.uk/businessindustryandtrade/business/activitysizeandlocation/datasets/uk-businessactivitysizeandlocation> (retrieved on August 23, 2016).

⁴⁵³ See De Mooij/Ederveen (2008) pp. 680 ff.

⁴⁵⁴ Again, taken at face value, column (1) of Table 33 suggests that the corporate firm share in the UK decreases by 0.45 percentage points or 0.6% (= $0.45 / (1-0.30)$) in response to simplified tax accounting available up to the threshold of GBP 77,000. Taking the consensus tax semi-elasticity of 0.7 reported in De Mooij and Ederveen (2008), a decrease of the corporate share by 0.6% could also be induced by a decrease of the tax rate differential between profits from non-corporate and corporate business by 0.9 percentage points ($-0.9 = -0.6 / 0.7$), which can be achieved by a corresponding cut in the top personal income tax rate. See De Mooij/Ederveen (2008) pp. 680 ff.

⁴⁵⁵ See Slemrod/Sorum (1984) pp. 461 ff.; Blumenthal/Slemrod (1992) pp. 373 ff.; Slemrod (1996) pp. 355 ff.; Eichfelder (2010) pp. 53 ff.

5.2.4.3 Robustness Checks

In a series of robustness checks, we deal with potential non-linearity of the empirical relationship at stake and check the robustness of our results to alternative definitions of the dependent variable. All robustness analyses control for time-constant confounding factors at the country-industry level, capture aggregate fluctuations via year fixed effects and include a set of additional time-varying covariates to capture potential sources of omitted country-specific trends.

In columns (1) and (2) of Table 34, we take into account that the corporate share of business is a proportion bounded between zero and one. As a consequence, the effect of the explanatory variable cannot be constant for all initial levels of non-corporate shares. To address this issue, we first use a logit transformation of the dependent variable.⁴⁵⁶ In other words, we map the bounded variable *NONCORP* to the real line, whereby the transformed variable equals $\ln(\text{NONCORP} / (1 - \text{NONCORP}))$. Employing a logit transformation, though, has the caveat of excluding all observations of the non-corporate share taking the values zero and one, since the transformation is not defined at these values. As an alternative, Papke and Wooldridge (1996 & 2008) recommend a non-linear fractional logit model.⁴⁵⁷ Their approach avoids the abovementioned problem by fitting a generalized linear model (GLM) with a binomial distribution and a logit link function using quasi-maximum likelihood estimation. With both estimation approaches our results turn out robust. Estimated coefficients of *LN_THRESHOLD* are again positive and significant at the 5% level when we employ the logit transformation in column (1) and the fractional logit model in column (2).⁴⁵⁸

In the next two columns (3) and (4) of Table 33, we address the issue of how to include partnerships in the calculation of corporate shares. A clear assignment of partnerships either to the non-corporate or the corporate sector is not feasible because the partnership category in Eurostat's Business Demography does not separately report data for limited and unlimited partnerships. Hence, it is impossible to determine whether the respective entities are subject to non-corporate or corporate tax treatment. We therefore assign partnerships to the corporate sector in column (3) and to the non-corporate sector in column (4) of Table 34. In both cases, we find that the inclusion of partnerships does not significantly affect our results.

⁴⁵⁶ See Lesaffre/Rizopoulos/Tsonka (2007) pp. 72 ff.

⁴⁵⁷ See Papke/Wooldridge (1996) pp. 619 ff.; Papke/Wooldridge (2008) pp. 121 ff.

⁴⁵⁸ Table A7 in the appendix presents the marginal effects for the generalized linear model.

Table 34: Eligibility for simplified tax accounting and non-corporate shares of business (robustness checks)

	Non-linear estimation		Inclusion of partnerships		Non-corporate share of employment (5)
	Log transformation	GLM	Corporate	Non-corporate	
	(1)	(2)	(3)	(4)	
<i>LN_THRESHOLD</i>	0.068** (0.029)	0.035** (0.015)	0.012** (0.005)	0.011** (0.005)	0.006 (0.007)
Constant	13.273** (1.781)	14.665*** (2.026)	2.872*** (0.317)	2.908*** (0.306)	1.187** (0.485)
Year dummies	✓	✓	✓	✓	✓
Country-Industry FE	✓		✓	✓	✓
Additional controls	✓	✓	✓	✓	✓
Observations	6,815	7,030	7,029	7,029	6,090
R ² _{adj}	0.128	-	0.100	0.149	0.045

Notes: In regressions (1) and (2), the dependent variable is the non-corporate firm share which equals the number of sole proprietorships divided by the number of all firms (excluding partnerships). In column (3), the dependent variable is the non-corporate firm share but it is defined as the number of sole proprietorships divided by the number of all firms (including partnerships). In regression (4), non-corporate firm share is the number of non-corporate entities (including partnerships) divided by the number of all firms (including partnerships). In column (5), non-corporate employment share is the ratio of the number of persons employed in sole proprietorships on the number of persons employed in all firms (excluding partnerships). All regressions except regression (2) control for country-industry fixed effects and a full set of year dummies. Regression (2) estimates a generalized linear model with a binomial distribution and a logit link function using quasi-maximum likelihood and includes full sets of country, industry and year dummies. *LN_THRESHOLD* is the natural logarithm of the turnover threshold up to which non-corporate enterprises are eligible for simplified tax accounting (in million euro). Additional controls include *TAX*, *GNIC*, *MINCAP* and *UNEMP*. These variables are defined and scaled as given in Table A5 in the appendix. Standard errors clustered at the country-industry level are given in parentheses; *, **, *** represent significance levels of 10%, 5%, and 1%, respectively.

Lastly, we are interested in whether the distortion of legal form decisions induced by simplified accounting also comes along with a significant shift of employment from the corporate to the non-corporate sector. In order to find this out, regression 5 of Table 34 uses the non-corporate share in employment as dependent variable in contrast to the non-corporate share in the number of businesses that was referred to in all previous regressions. In the respective column (5) of Table 34, the estimated coefficient of *LN_THRESHOLD* (0.006) is positive but small and statistically insignificant at conventional significance levels. Hence, variation in eligibility thresholds for simplified accounting has a rather negligible effect on the number of persons actually employed in the non-corporate sector. As employment is concentrated in larger companies, this finding reflects that only the smallest businesses are target-

ed by simplified tax accounting. Moreover, large companies generally tend to be less responsive to tax-related incentives in their legal form.⁴⁵⁹

5.2.5 *Conclusion*

This study investigates whether the ability to choose simplified methods of tax accounting is an important consideration in legal form decisions. Most European countries provide simplified, cash-based rules of tax accounting for small firms that considerably deviate from their general accrual tax accounting rules. Simplified tax accounting, however, is only available for non-corporate businesses. If simplified tax accounting was indeed associated with a net benefit, its (un-)availability could change the relative gain to incorporation.

We test this conjecture using a sample of corporate share data derived from Eurostat's Business Demography for 27 European countries over the period 2004 - 2010. Employing a difference-in-differences approach, we estimate the effect of variation in eligibility thresholds for simplified tax accounting by comparing the change in countries' non-corporate shares of business before and after a change in thresholds to the change in non-corporate shares of business in countries with a constant regime. The results from our generalized difference-in-differences regressions suggest that simplified tax accounting indeed distorts legal form decisions of eligible businesses. Quantitatively, we estimate an increase of the eligibility threshold by € 100,000 to increase the non-corporate firm share by about 0.47 percentage points. Moreover, our results suggest that, in relative terms, a 1% shift in the eligibility threshold increases the non-corporate share of business by about 0.013 percentage points. Taking the introductory example of the United Kingdom, where simplified tax accounting was introduced in 2012, back-of-the-envelope calculations on the basis of our results show that about one in a hundred newly eligible entrepreneurs might refrain from incorporation due to the introduction of the simplified regime.

While our findings are consistent with businesses seeking to reduce accounting-related compliance costs, we acknowledge that our approach, like any empirical study, is subject to some limitations. In particular, the aggregate nature of our legal form data makes it impracticable to trace legal form decisions around the relevant turnover cut-offs directly at the micro-level. Whereas our approach allows the detection of a statistical effect, we can only

⁴⁵⁹ See Goolsbee (2004) pp. 2283 ff.; De Mooij/Nicodème (2008) pp. 478 ff.

approximate the response elasticities. We therefore propose that future research further explores this relevant real response to accounting rules once comprehensive and representative micro data on the distribution of legal forms in the business population are made accessible.

5.3 *Interim Conclusion*

Tax incentives for specific groups of taxpayers are inherently opposed to the principle of neutrality that should be key in the design of tax systems. In some cases, a deterioration of the overall neutrality of the tax system is justifiable, e.g., by the alleviation of market failures. In the case of SME tax incentives, though, the benefits are mostly limited while the costs are substantial.

Distortions of investment and legal form decisions constitute one major source of the welfare costs of SME tax incentives. The empirical evidence at hand documents distortions, which – at least to some degree – can be traced back to inadequate incentive designs. Above all, the ill-advised practice of applying eligibility criteria explicitly referring to firm size leads to adverse effects. If outgrowing certain size criteria comes along with the forfeiture of the benefits, firm growth around the thresholds obviously is discouraged. As a consequence, taxpayers bunch at the kinks and notches created by the thresholds. They avoid outgrowing the size criteria given in tax codes as the costs of losing the incentives exceeds the benefits of growth. For income thresholds, comparatively small incentives have been shown to induce quite distinct bunching responses by taxpayers, which are predominantly attributable to misreporting. Turnover and employment, two of the SME indicators proposed by the European Commission, in contrast, appear to be less responsive, most likely because they are not as easy to manipulate. Still, substantial bunching occurs at some notches in the examined countries. In particular, simplified regimes replacing ordinary income taxes as well as other duties such as social security contributions and the VAT offer benefits to the very smallest businesses which are big enough for these businesses to actually pass up growth opportunities. The evidence suggests that the benefits relate to the actual tax liability as well as to the administrative burden induced by taxation.

In line with these results, access to simplified tax accounting also distorts the legal form decision of entrepreneurs. As the simplified procedures are usually only available for non-corporate entities, they constitute an incentive to refrain from incorporation. Quantitatively, about one in a hundred entrepreneurs remains non-corporate if he can thereby dodge more complex regulations on tax accounting. For policy-makers, these results do not only show the significance of compliance costs for small businesses but also the importance of a careful design of SME tax incentives. Obviously, certain distortions cannot be avoided completely. With regard to simplified tax accounting, for example, an extension of the regimes to corpo-

rate entities is likely to be useless as corporations are usually obliged to keep accruals-based books for financial reporting purposes anyway. Moreover, other eligibility criteria than turnover thresholds are hardly feasible so that administrative notches are practically inevitable. Legislators should, however, be careful not to offer too beneficial regimes that deviate starkly from the standard procedures. Otherwise, the transition to the ordinary regime becomes an actual barrier to growth. As far as non-administrative reliefs such as tax credits or special allowances are concerned, explicit size criteria should clearly be avoided. If small businesses are intended to benefit more from the respective regimes than large entities, absolute caps on available reliefs are the superior approach. Such caps do not directly discourage businesses from growing and they are easier to handle from an administrative point of view.

Besides distortions of investment and legal form decisions, SME tax incentives come along with further disadvantages. First of all, provisions awarding special treatment to certain taxpayers raise the complexity of the tax code, which increases compliance costs for taxpayers as well as the collection costs on the side of tax administrations.⁴⁶⁰ Given small businesses' sensitivity to compliance costs, policy-makers should thus be particularly careful if and how to install discriminatory provisions. Additional opportunities for tax planning and misuse are another factor to consider in this regard.⁴⁶¹ Even in the absence of misuse, though, SME tax incentives cause substantial losses in (net) tax revenues. Due to the large number of SMEs, even incentives of limited generosity can have significant repercussions. In the U.S., for example, SME tax incentives have been estimated to induce revenue costs of \$ 11.5 billion in 2009, which amounts to about 0.5% of the overall federal tax collections and almost 8% of the corporate tax revenue.⁴⁶² Limiting the number of eligible SMEs by additional criteria, on the other hand, makes provisions even more complex and less attractive for the addressed small businesses who suffer from disproportionate compliance burdens anyway.

Negative effects on the overall fairness of the tax system and unwanted redistributive properties are further concerns over the use of SME tax incentives. In the end, all taxes are carried by individuals, most notably the owners whose returns are diminished by business taxes. As the owners of small businesses are, on average, significantly richer than the rest of

⁴⁶⁰ See Chen/Mintz (2011) p. 17.

⁴⁶¹ See Bird/Wallace (2004) pp. 143 ff.; Keen (2013) p. 27.

⁴⁶² This number does only include the incentives explicitly targeted at SMEs. Adding indirect benefits for small businesses, the figure could be substantially higher. See Department of the Treasury (2010) p. iii; Looney (2011) p. 132.

the population, SME tax incentives could introduce regressive elements to taxation, thus making the rich even richer.⁴⁶³ From a policy perspective, the introduction of SME tax incentives may also be dangerous because incentives are difficult to revoke. Once businesses have got used to certain benefits, policy-makers usually refrain from taking them back. Oftentimes, businesses and lobbyists even demand the extension of reliefs. In the case of SME tax incentives, this could mean an extension to large businesses or an increased generosity of the incentives.⁴⁶⁴

Summing up, the costs and adverse effects outweigh the benefits for the vast majority of currently available SME tax incentives, in particular the non-administrative regimes. Policy-makers should therefore shift their focus to the provision of a neutral and simple tax system. Instead of trying to compensate for one distortion by introducing another, the removal of the actual frictions – especially those emanating from the tax system – must be pursued. Accordingly, exclusive benefits for SMEs should generally be refrained from. This would not only be conducive to the simplicity and the neutrality of taxation, but it would also free resources for broadly applicable tax reductions and additional public spending, e.g., on education and infrastructure.⁴⁶⁵

⁴⁶³ See Guenther (2009) p. 24; Looney (2011) pp. 129 f. On the other hand, theoretical as well as empirical evidence suggests that employees and customers also carry a substantial part of the tax burden imposed on businesses. See Harberger (1962) pp. 215 ff.; Diamond/Mirrlees (1971a) pp. 8 ff.; Harberger (2006) pp. 283 ff.; Gravelle (2013) pp. 185 ff.

⁴⁶⁴ See Crawford/Freedman (2010) p. 1086; Alt/Preston/Sibieta (2010) pp. 1226 ff.; Arnold/Brys/Heady/Johansson/Schwellnus/Vartia (2011) p. F73.

⁴⁶⁵ See OECD (2010a) p. 139; Arnold/Brys/Heady/Johansson/Schwellnus/Vartia (2011) p. F71.

6. Designing an Investment-Friendly Tax System for SMEs – The Case of Germany

The above analysis provides evidence that SME tax incentives are usually not an adequate policy tool to encourage innovation, job creation and economic growth. Neither are tax incentives the right instrument to correct for elements of the tax system that systematically discriminate against SMEs (except for excessive compliance burdens). Instead, policy-makers should directly address the shortcomings of the tax system and provide a generally investment-friendly tax environment for all businesses *including* SMEs. For SMEs – especially for the innovative high-growth SMEs being targeted by numerous policy initiatives – neutrality, simplicity and the absence of impediments to growth and internationalization are the most important properties of an attractive tax system. The following study examines in how far German policy-makers have succeeded in this endeavor since 2000.⁴⁶⁶

6.1 Introduction

Despite the highlighted significance of SMEs in Germany – the so-called *Mittelstand* – German policy-makers have mostly refrained from the usage of SME tax incentives.⁴⁶⁷ While this approach is commendable, the overall investment-friendliness of the German tax system has been questioned regularly.⁴⁶⁸ The two most recent major tax reforms in Germany – the *Steuersenkungsgesetz* in 2001 and the *Unternehmensteuerreformgesetz* in 2008/09 – explicitly aimed at improving investment conditions in Germany, thereby creating jobs and increasing Germany’s long-term attractiveness as an investment destination. The endeavor, however, has been perceived to be unsuccessful.⁴⁶⁹ Germany’s tax system is still seen as a competitive disadvantage rather than a factor encouraging business activity. The following analysis investigates whether this perception is justified or if the reforms actually

⁴⁶⁶ The study is joint work with Christoph Spengel and was originally conducted for the German *Sachverständigenrat zur Begutachtung der gesamtwirtschaftlichen Entwicklung* [Sachverständigenrat], a leading German institution that annually evaluates the development of the economy and advises policy-makers. See Sachverständigenrat (2015) pp. 336 ff.; Spengel/Bergner (2015) pp. 1 ff. The data on the cost of capital and effective tax rates is taken from a study by the Centre for European Economic Research (ZEW) for the European Commission. See ZEW (2015) pp. 1 ff.

⁴⁶⁷ Disregarding administrative reliefs such the VAT exemption and the option of simplified tax accounts for the very smallest businesses, only two minor SME tax incentives exist in Germany. The investment reserve and the scheme of accelerated depreciation only apply to micro businesses and their impact on effective tax burdens is very limited. See Section 3.1.1 and the country report on Germany in Annex 1.

⁴⁶⁸ See Evers/Spengel/Braun (2015) pp. 3 ff.; Schlie/Spengel/Malke (2015) pp. 570 ff.

⁴⁶⁹ See Kleinedam/Liebchen (2007) pp. 409 ff.; Homburg (2006) pp. 6 ff. The rather negative perception also became apparent in the mass media. See Spiegel (2007): <http://www.spiegel.de/wirtschaft/reform-der-unternehmensteuer-steinbruecks-mogelpackung-a-459998.html> (retrieved on July 20, 2016).

increased the competitiveness of the German tax system. The focus of the analysis is in particular on potential impediments for small and up-coming SMEs.

The following analysis includes a review of the most important elements of the *Steuersenkungsgesetz* in 2001 and the *Unternehmensteuerreformgesetz* in 2008/09 (Section 6.2) as well as an extensive quantification of the effects of the reforms with the help of the Devereux/Griffith Model (Section 6.4). The latter is a neoclassical model, which calculates after-tax costs of capital and average effective tax rates for investments based on the national tax codes in the EU (Section 6.3). It enables a cross-country comparison of effective tax burdens of domestic and cross-border investments as well as a comparison of different types of investments and forms of financing. The analysis thus allows conclusions about the development of the international competitiveness of the German tax system and – probably even more important with regard to SMEs – about its neutrality and the induced discrimination against SMEs. The exclusion of transparently taxed entities is a limitation of the analysis with the Devereux/Griffith model. Chapter 6.4.4 therefore complements the quantitative analysis and gives an overview of the most important developments in the taxation of sole proprietors and partnerships before Section 6.5 summarizes the main findings of the analysis.

6.2 *German Tax Reforms in 2001 and 2008/09*

At the end of the 1990's, the taxation of corporate entities and their shareholders distinguished significantly from today's approach as Germany applied a dividend imputation system. Under this approach, double taxation is avoided by imputing the amount of corporate income tax paid to the personal income tax payable on the shareholder level.

In 1999, corporations were subject to a split corporate income tax rate. Retained profits were taxed at 40% whereas a reduced rate of 30% was applied to distributed profits. Hence, retained profits were significantly disadvantaged. Besides the corporate income tax, corporations were subject to the solidarity surcharge (5.5% of the corporate income tax payable) and the trade tax (on average about 15% of the adjusted taxable income), which was deductible for the determination of its own tax base as well as the corporate income tax base. Altogether, the average nominal tax rate on profits on the corporate level amounted to 52.35% in 1999. With regard to taxable income, a broadening of the tax base had kicked in prior to 1999 as increasingly restrictive rules on the recognition of provisions and the offset of losses were established.⁴⁷⁰

On the shareholder level, distributed profits were fully subject to the progressive personal income tax schedule. As mentioned before, the corporate income tax paid was deducted, thereby reducing the personal income tax payable. Ultimately, distributed profits were thus only subject to the personal income tax of the shareholder (including the solidarity surcharge) and the trade tax. The progressive income tax rate in 1999 ranged from 23.9% to 53% and decreased in the following year (to 22.9% and 51%, respectively). Individuals' capital gains from the disposal of shares were exempt from the personal income tax if the shares were held for at least one year and if the holding quota did not exceed 10%.⁴⁷¹

Altogether, Germany – with a nominal tax burden of over 50% – had the reputation of a high-tax country around the turn of the millennium and the full imputation system for dividends was increasingly criticized for being too complicated, too prone to misuse and even illegitimate under European law. The government therefore initiated a tax reform in 2001, the

⁴⁷⁰ The restrictions included, for example, restricted set-offs of losses incurred by foreign permanent establishments or the limitation of loss carrybacks. For a comprehensive description of the German taxation of corporations before the reform in 2001, see Jacobs/Scheffler (1998) pp. 136 ff.

⁴⁷¹ If shares were resold within 12 months, capital gains were taxed at the full progressive PIT rate whereas half the regular rate applied to capital gains from shares that were classified as business assets.

Steuersenkungsgesetz, that intended the provision of comprehensive tax reliefs for businesses, employees and families by lowering nominal tax rates while broadening the tax base. The reform intended to enhance the competitiveness of Germany's economy and to promote growth and job creation. Further goals included improved equity and transparency in the tax system and more planning dependability.

Most importantly, the *Steuersenkungsgesetz* replaced the full imputation system with a shareholder relief system, the so-called *Halbeinkünfteverfahren*. Under this system, double taxation was reduced by a lower corporate income tax rate and a 50% exemption of distributions on the shareholder level. Other major changes included the modification of depreciation rules, the reduction of PIT rates and the imputation of a part of the trade tax to the personal income tax for transparently taxed entities (see Table 35 for an overview).⁴⁷²

Table 35: Major changes introduced by the *Steuersenkungsgesetz* (2001)

Change	Description
Standardization and reduction of the CIT rate	<ul style="list-style-type: none"> • 25% on retained and distributed profits
Introduction of the <i>Halbeinkünfteverfahren</i> for the taxation of dividends	<ul style="list-style-type: none"> • exemption of 50% of dividends from corporations on the shareholder level • taxation of the other 50% at the progressive personal income tax rate plus solidarity surcharge • application also for shareholdings in foreign companies and shareholdings classified as business assets
Change of capital gains taxation (disposal of shareholdings classified as non-business assets)	<ul style="list-style-type: none"> • application of the <i>Halbeinkünfteverfahren</i> for sales within 1 year • application of the <i>Halbeinkünfteverfahren</i> if a qualified shareholding (> 1%) existed in the 5 years prior to the sale • exemption of capital gains from unqualified shareholdings (< 1%)
Modification of depreciation rules	<ul style="list-style-type: none"> • reduction of depreciation rate for movable assets from 30 to 20% (declining balance method) • extension of the depreciation period for buildings (business facilities) from 25 to 33 years
Stepwise reduction of progressive PIT rate	<ul style="list-style-type: none"> • from 51% (2000) to 48.5% (2001–2003), 45% (2004) and eventually 42% in 2005 (top rate) • from 22.9% (2000) to 19.9% (2001–2003), 16% (2004) and eventually 15% in 2005 (bottom rate)
Exemption of dividends and capital gains from the disposal of shareholdings for corporate entities	<ul style="list-style-type: none"> • 5% of dividends and capital gains taxable as non-deductible business expense • includes outbound investments if no CFC rules apply

⁴⁷² For a detailed description of the changes introduced by the *Steuersenkungsgesetz* in 2001, see PwC Deutsche Revision (2000) pp. 33 ff.; Jacobs/Scheffler (2002) pp. 143 ff.

Change	Description
Reduction of withholding tax on capital investments	<ul style="list-style-type: none"> • from 25% to 20%
Tax relief for transparently taxed businesses	<ul style="list-style-type: none"> • (partly) imputation of the trade tax in the personal income tax (180% of the <i>Gewerbesteuermessbetrag</i> – ca. 40% of the average trade tax payable)

In the years following the 2001 tax reform, some minor changes occurred that had an impact on businesses' effective tax rates. In 2003, the corporate income tax rate was temporarily increased to 26.5% and in 2006 the depreciation rate for movable business assets was raised to 30% again. In 2007, a new maximum PIT rate of 45% was introduced.

In spite of the comprehensive reform in 2001, Germany still exhibited comparably high tax burdens for corporations. The *Unternehmensteuerreformgesetz* in 2008/09 therefore aimed at further improving the conditions for growth and employment and at making Germany more attractive for foreign investors. Securing long-term tax revenues was another crucial motivation for the reform. The most important component of the reform was the evolution of the shareholder relief system. The corporate income tax rate was further reduced and the *Halbeinkünfteverfahren* was replaced by the *Teileinkünfteverfahren* and the *Abgeltungsteuer*. Moreover, the trade tax was modified again while the tax base of the corporate income tax further broadened (see Table 36 for an overview of the changes).⁴⁷³

Table 36: Major changes introduced by the *Unternehmensteuerreformgesetz* (2008/09)

Change	Description
Reduction of the CIT rate	<ul style="list-style-type: none"> • from 25% to 15%
Introduction of the <i>Abgeltungsteuer</i> and the <i>Teileinkünfteverfahren</i> for the taxation of dividends derived from shareholdings classified as non-business assets	<ul style="list-style-type: none"> • gross taxation of dividends at 25% (plus solidarity surcharge) for shareholdings not classified as business assets (<i>Abgeltungsteuer</i>) • no deduction of related expenses except for a lump-sum deduction of 801 € (<i>Sparerpauschbetrag</i>) • if holding quota over 25% or if over 1% and shareholder is also an employee of the respective company (= qualified shareholding), the shareholder has the option of applying the <i>Teileinkünfteverfahren</i>: taxation of 60% of the dividend at progressive PIT rate of the shareholder (similar to <i>Halbeinkünfteverfahren</i> but with a less generous exemption)

⁴⁷³ For a detailed description of the changes introduced by the *Steuersenkungsgesetz* in 2001, see PwC (2008) pp. 85 ff.; Jacobs/Scheffler (2009) pp. 158 ff.

Change	Description
Introduction of the <i>Abgeltungsteuer</i> and the <i>Teileinkünfteverfahren</i> for the taxation of capital gains derived from the disposal of shareholdings classified as non-business assets	<ul style="list-style-type: none"> • gross taxation of capital gains at 25% (plus solidarity surcharge) for shareholdings not classified as business assets that have not reached holding quota of at least 1% within the 5 years prior to the disposal (<i>Abgeltungsteuer</i>) • application of the <i>Teileinkünfteverfahren</i> if shareholding reached holding quota of at least 1% within the 5 years prior to the disposal (= qualified shareholding)
Introduction of the <i>Teileinkünfteverfahren</i> for shareholdings classified as business assets	<ul style="list-style-type: none"> • application of the <i>Teileinkünfteverfahren</i> for dividends and capital gains from shareholdings classified as business assets (irrespective of the holding quota)
Introduction of the <i>Abgeltungsteuer</i> for interest payments (non-business assets)	<ul style="list-style-type: none"> • income from interest payments subject to the <i>Abgeltungsteuer</i> if derived from assets not classified as business assets
Modification of depreciation rules	<ul style="list-style-type: none"> • abolition of declining balance method • immediate depreciation only for assets with acquisition costs up to € 150 (again increased to 410 € in 2010)
Modification of the trade tax	<ul style="list-style-type: none"> • trade tax payable no longer deductible as a business expense • standardization and decrease of base rate (<i>Gewerbesteuermesszahl</i>) for all legal forms • increased imputation of trade tax within the PIT (maximum of 3.8 times the base rate (previously 1.8) for transparently taxed businesses) • extended catalogue of non-deductible expenses for financing and leasing (25%) • reduction of non-deductible interest payments that are added to the tax base from 50% to 25%
Introduction of the interest barrier (<i>Zinsschranke</i>)	<ul style="list-style-type: none"> • interest expenses fully deductible up to the amount of taxable income from interest payments • beyond this amount interest expenses are deductible up to € 1 million or 30% of EBITDA • restriction not applicable if taxpayer is neither a member of a group nor inadequately financed by shareholder debt and if certain criteria with regard to the equity ratio are satisfied
Other changes	<ul style="list-style-type: none"> • more restrictive loss trafficking rules • introduction of a reduced proportional PIT rate for retained profits (deferred taxation upon distribution)

Since 2008, business taxation in Germany has not experienced major changes. Minor modifications include the temporary re-emergence of the declining balance method for the depreciation of movable assets in 2009 and 2010 (maximum depreciation rate: 25%) as well as the introduction of more generous rules for loss offsets in the corporate income tax and a relaxation of the interest barrier (maximum for deductible interest expenses not covered by qualifying interest income increased from € 1 million to € 3 million).

6.3 *Measuring Effective Tax Rates with the Devereux/Griffith Model*

This examination of the general investment friendliness of the German tax system and its evolution from 1999 to 2014 centers around the calculation of effective tax rates of corporations.⁴⁷⁴ The analysis covers domestic as well as outbound (German investor with a foreign subsidiary) and inbound cross-border investments (foreign investor with a German subsidiary). Effective tax burdens are measured in two ways. First, the cost of capital is considered. It primarily influences the volume of investments and the competitiveness of businesses. Second, the analysis uses effective average tax rates (EATR) of profitable investments. This measure drives the basic decision to invest as well as location decisions of companies. Both indicators are calculated for Germany and the other EU Member States to not only allow conclusions on the evolution of investment conditions in Germany but also on Germany's competitiveness and the appropriateness of its reforms with regard to the international tax competition.

The neoclassical Devereux/Griffith Model is the approach chosen to calculate the cost of capital and effective average tax rates.⁴⁷⁵ The calculation of the former is based on a marginal (normalized) one-period investment (i.e., the after-tax net present value is zero). The model determines the cost of capital that a business must generate in order to pay investors exactly the required minimum rate of return (usually derived from comparable capital market investments). The tax burden of the marginal investment, the so-called effective marginal tax rate (EMTR), is calculated as follows:

$$EMTR = \frac{\tilde{p} - r}{\tilde{p}},$$

where \tilde{p} denotes the costs of capital and r the after-tax rate of return.

The model assumes the size of the investment to be extended until marginal returns equal marginal costs. The cost of capital impacts the volume of investments and a country's relative attractiveness for investment extensions compared to alternative investment locations. As the cost of capital is given for different types of assets and financing, the model also allows a differentiated analysis of the impact of taxes with regard to these factors. Lastly, the

⁴⁷⁴ The exclusive consideration of corporations, of course, represents a limitation of the model as many SMEs, especially micro enterprises, do not incorporate. Section 6.4.4, however, also discusses the development of effective tax rates for transparently taxed entities.

⁴⁷⁵ See Devereux/Griffith (1999) pp. 1 ff.; Devereux/Griffith (2003) pp. 107 ff. The following summary of the approach also builds on the detailed model descriptions given in previous studies. See Sachverständigenrat (2001) pp. 296 ff.; European Commission (2015b) pp. 104 ff.

cost of capital is an indicator of price floors below which businesses are pushed out of the market. Higher (lower) cost of capital requires higher (lower) prices and deteriorates the competitiveness. Hence, the analysis of the cost of capital points to potential effects of taxes on international competition.

Oftentimes, investors are more interested in the effects of taxation on profitable undertakings than they are in marginal investments. Such investments feature a positive net present value and generate so-called economic rents. The measure of interest for these investments is the effective average tax rate (EATR). It is more useful in scenarios where investors face the choice between alternative profitable investments, e.g., if a subsidiary can be founded in different locations or if alternative production technologies are available. The EATR according to the Devereux/Griffith Model is calculated as the difference of the pre-tax and the after-tax net present value (R^* and R , respectively) divided by the discounted pre-tax rate of return p :

$$EATR = \frac{R^* - R}{\frac{p}{1+r}}.$$

The calculation of the EATR is based on the tax-induced reduction of the NPV. From the point of view of the investor, the attractiveness of an investment at a certain location increases in its NPV and decreases in the EATR.

The model by Devereux/Griffith also relates the EATR to the EMTR, thereby displaying the similarities and differences of both measures:

$$EATR = \frac{\tilde{p}}{p} \cdot EMTR + \frac{p - \tilde{p}}{p} \cdot s_u.$$

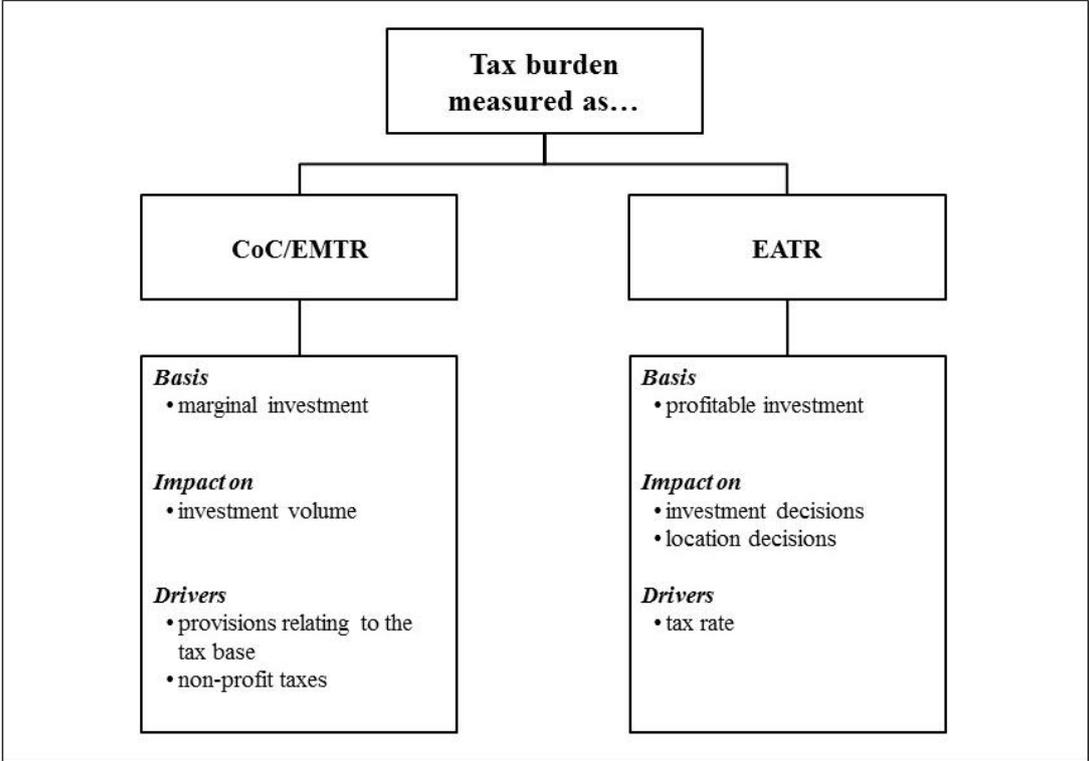
Disregarding taxation on the shareholder level, the EATR represents the weighted average of the EMTR and the nominal CIT rate s_u on returns exceeding the cost of capital.⁴⁷⁶ Accordingly, the EATR and the EMTR are the same for marginal investments (i.e., when the rate of return equals the costs of capital). If the rate of return increases, however, the EATR approaches the nominal tax rate s_u .

For tax purposes, deductions such as depreciation (partly) offset positive future cash flows when determining taxable income. The role of provisions relating to the tax base and

⁴⁷⁶ For a detailed description of this relation as well as the following remarks, see Spengel/Lammersen (2001) pp. 222 ff.

the tax rate therefore depends on the relative size of the cash flows. Marginal investments have a net present value of zero, i.e., the present value of future cash flows merely equals the initial investment. Hence, provisions relating to the tax base are comparatively influential in this scenario underlying the calculation of the EMTR. Highly profitable investments, in contrast, feature larger cash flows. The EATR is therefore primarily driven by the tax rate applying to the difference of cash flow and deductible tax-related expenses (see Figure 14 for an overview of the most important drivers of both measures).

Figure 14: Measures of effective tax burden and main drivers (Devereux/Griffith model)

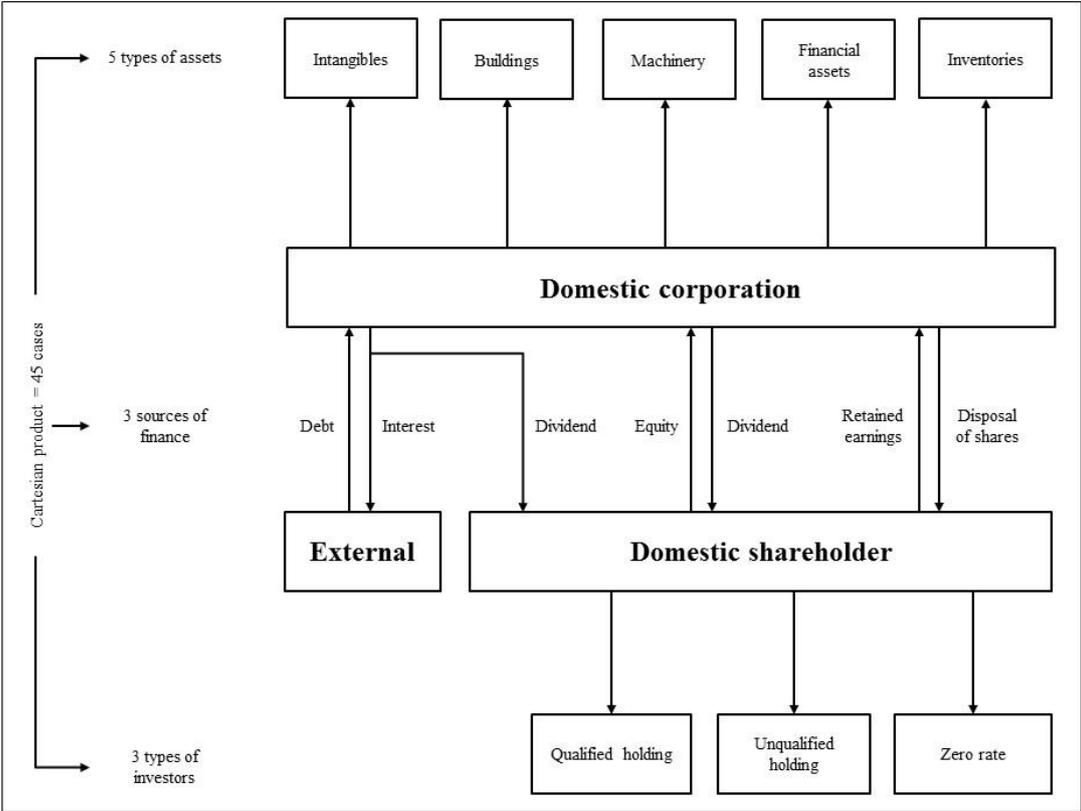


Altogether, a comprehensive evaluation of the effects of the German tax reforms in 2001 and 2008/09 on the investment climate requires the cost of capital⁴⁷⁷ as well as the EATR. The cost of capital is an indicator of the price floor of businesses. It allows conclusions about the competitiveness of businesses which operate in the same markets but are subject to different tax systems. Moreover, the cost of capital is needed for inferences on the volume of potential investments. The EATR, on the other hand, is the relevant measure for choices between different investment projects and locations.

⁴⁷⁷ The cost of capital and the EMTR can be used interchangeably as each measure is based on a marginal investment and both measures are directly connected to each other, i.e., the EMTR increases in the cost of capital. The cost of capital, however, is the more intuitive measure to interpret. The analysis in Section 6.4 therefore focuses on the cost of capital as the main measure of interest.

In the calculation of effective tax burdens for Germany and the other EU Member States, differences in tax systems, types of applicable taxes, tax bases and tax rates are distinguished on the level of the company and the level of the investor. The underlying economic model of the Devereux/Griffith approach assumes a domestic company and a domestic investor in the base setting. The company can invest in five types of assets while the required capital can either stem from self-financing, new equity or debt financing. In the case of self-financing, the profits of the company are retained and increases in company value are realized as capital gains when the shares are disposed of at the end of the investment period. In the case of new equity, only dividends are paid, whereas debt financing induces interest payments at a fixed interest rate. Only profits exceeding this rate are distributed as dividends. On the investor level, three kinds of investors are distinguished: 1) investors being exempt from taxation, 2) investors with a qualified holding underlying the maximum nominal tax rate and 3) investors with an unqualified holding underlying the maximum nominal tax rate (see Figure 15).

Figure 15: Framework for domestic investments (Devereux/Griffith model)



Based on the scheme displayed in Figure 15, the following components of the tax code are included in the calculations:

- Income taxes on the company level that are affected by the investments undertaken and the types of financing used
 - nominal tax rates
 - depreciation on intangible assets, machinery and buildings
 - valuation of inventory
 - deductibility of interest expenses
 - structure of the corporate income tax systems
- non-profit taxes on the company level
 - nominal tax rates
 - tax bases
- income tax on the shareholder level
 - on dividends
 - on capital gains
 - on income from interest payments
- wealth tax at the investor level
 - on shareholdings
 - on receivables of natural persons depending on the kind of shareholding (qualified or unqualified)

Moreover, assumptions on the types of assets, investors and financing as well as the pre-tax rate of return, the real interest rate, the inflation rate and the economic depreciation period of assets need to be made (see Table 37). Given five possible asset classes, three ways of financing and three types of investors, 45 investment scenarios exist in the model. In order to keep the analysis manageable, the analysis does not consider each combination separately but uses overall effective tax rates that are derived as weighted averages of all possible combinations. While a balanced average is taken across all types of assets and investors, self-financing is weighted stronger (55%) than new equity (10%) and debt financing (35%). Additionally, the following analysis displays the cost of capital and the EATR separately for the company and the investor level.

Table 37: Model assumptions (Devereux/Griffith model)

Assumptions on applicable types of taxes and tax bases			
<i>Company level</i>	corporate income tax, surcharges, local business taxes, non-profit taxes		
<i>Investor level</i>	personal income tax, wealth tax, surcharges		
<i>Tax base</i>	depreciation, method of valuing inventory, deductibility of interest expenses		
<i>Types of assets</i>	intangible assets, buildings, machinery, financial assets, inventory		
Assumptions on assets, financing and investors			
<i>Financing</i>	self-financing, new equity financing, debt financing		
<i>Investors</i>	maximum (marginal) nominal tax rate (qualified and unqualified holding), zero tax rate		
<i>Weighting of assets, investors and financing</i>	proportional weighting for different types of assets (20% each) and investors (33.3% each); unbalanced weighting for different forms of financing (55% self-financing, 10% new equity financing, 35% debt financing)		
Assumptions on depreciation, inflation, interest rate and pre-tax rate of return			
<i>Economic depreciation period</i>	12.5 years for intangibles	53 years for buildings	11 years for machinery
<i>Inflation rate</i>	2%		
<i>Real interest rate</i>	5%		
<i>Pre-tax rate of return (EATR)</i>	20%		

Although shareholder taxation is included in the analysis, its importance for investment decisions is not clear. It is highly dependent on the spectrum of investors of a company. In the case of SMEs, which often feature a small number of natural persons as shareholders – possibly even making their living on the proceeds from the company – investor-level taxes can be assumed to play a significant role. In contrast to that, multinational companies with larger numbers of shareholders usually do not take personal income taxation into account in their decision-making. Reasons hereof include the lack of information about the individual circumstances of the shareholders as well as the irrelevance of personal taxes resulting from the exemption of many (institutional) shareholders and the high degree of mobility of capital. Moreover, the required rate of return for large enterprises is likely to be independent from the domestic supply of capital. Instead, large businesses can access global capital markets on which the taxation of capital income in single countries is of very limited relevance. Domestic personal taxes therefore rather affect the saving decisions of domestic investors than the actu-

al cost of capital of (public) companies.⁴⁷⁸ In order to cover all possible scenarios and because of the special focus on SMEs, taxes on the investor level are considered separately for domestic investments in the following analysis.

⁴⁷⁸ Personal income taxes may still be relevant for the costs of capital if an imputation system is applied domestically and the shares are predominantly held by taxpayers with unlimited tax liability. This case should be the exemption rather than the rule for multinational companies, though.

6.4 Costs of Capital and Effective Average Tax Rates for German Investments

6.4.1 Cost of Capital and Effective Average Tax Rate for Domestic German Investments

6.4.1.1 Corporate Level

a) Cost of Capital

Tables 38 and 38 display the development of the cost of capital on the corporate level for the purely domestic case from 1999 to 2014. The calculations distinguish the three forms of financing (see Table 38⁴⁷⁹) and the five possible types of assets (see Table 39).

From 1999 to 2014, the average cost of capital on the corporate level decreased from 7.7% to 6.5%. Disregarding the investor level, investment conditions in Germany improved for corporate businesses. At the end of the period, the pre-tax rate of return required from investments in order to be profitable is 1.2 percentage points lower than in 1999. Since the *Unternehmensteuerreformgesetz* in 2008/09, however, the cost of capital has remained at the level of 6.5% due to a lack of reforms.

Table 38: Cost of capital of domestic investment on corporate level in Germany by type of financing (Devereux/Griffith model)

CoC in %	SF	EF	DF	Ø
1999	10.4	8.1	3.5	7.7
2000	10.4	8.1	3.5	7.7
2001	8.4	8.4	4.6	7.1
2002	8.4	8.4	4.6	7.1
2003	8.6	8.6	4.6	7.2
2004	8.4	8.4	4.6	7.1
2005	8.4	8.4	4.6	7.1
2006	8.3	8.3	4.5	7.0
2007	8.3	8.3	4.5	7.0
2008	7.4	7.4	4.7	6.5
2009	7.3	7.3	4.6	6.4
2010	7.3	7.3	4.6	6.4
2011	7.4	7.4	4.7	6.5
2012	7.4	7.4	4.7	6.5
2013	7.4	7.4	4.7	6.5
2014	7.4	7.4	4.7	6.5

⁴⁷⁹ As described in Section 6.3, the average cost of capital is derived by an unbalanced weighting of the three forms of financing: self-financing (55%), equity financing (10%) and debt financing (35%). The same weighting is applied in the remainder of the analysis.

With regard to the different forms of financing (see Table 38), self-financing and new equity financing were unburdened significantly whereas the cost of capital for debt financing increased. Moreover, the cost of capital of both forms of equity financing were aligned in 2001. The development was especially beneficial for businesses with limited access to capital markets – a group that includes the majority of SMEs. Real investments (i.e., buildings, intangibles and machinery) were subject to smaller reliefs compared to financial assets. Their relative advantage in terms of cost of capital was reduced from 3.2 percentage points in 1999 (10% compared to 6.8%) to 0.8 percentage points in 2014 (7.2% compared to 6.4%). Investments in financial assets were therefore more incentivized than real investments.

Table 39: Cost of capital of domestic investment on corporate level in Germany by asset type (Deveureux/Griffith model)

CoC in %	Buildings	Intangibles	Machinery	Financial assets	Inventory	Ø
1999	7.5	6.4	6.8	10.0	7.9	7.7
2000	7.5	6.4	6.8	10.0	7.9	7.7
2001	7.3	6.1	6.9	8.2	6.9	7.1
2002	7.3	6.1	6.9	8.2	6.9	7.1
2003	7.4	6.1	6.9	8.4	7.0	7.2
2004	7.3	6.1	6.9	8.2	6.9	7.1
2005	7.3	6.1	6.9	8.2	6.9	7.1
2006	7.3	6.1	6.3	8.2	6.9	7.0
2007	7.4	6.1	6.3	8.2	6.9	7.0
2008	6.7	5.7	6.4	7.2	6.3	6.5
2009	6.7	5.7	6.0	7.2	6.3	6.4
2010	6.7	5.7	6.0	7.2	6.3	6.4
2011	6.7	5.7	6.4	7.2	6.3	6.5
2012	6.7	5.7	6.4	7.2	6.3	6.5
2013	6.7	5.7	6.4	7.2	6.3	6.5
2014	6.7	5.7	6.4	7.2	6.3	6.5

Looking at the two major reforms, the effects of the *Steuersenkungsgesetz* in 2001 are clearly noticeable. The alignment of the corporate income tax rate for retained and distributed profits to 25% (from 40% and 30%, respectively) equalized the cost of capital for both forms of equity financing (8.4%). While the cost of capital on self-financing decreased significantly from 10.4%, new equity financing experienced a slight increase of the cost of capital. The two main drivers of this development were the reduction of the CIT rate and the broadening of the tax base. For self-financing, the tax rate cut outweighed the increasingly restrictive depreciation rules (i.e., reduced depreciation rates for movable assets and buildings) while the extended tax base dominated in the case of new equity. For debt financing, an even larger

increase in the cost of capital occurred (from 3.5% to 4.6%) with new depreciation rules as well as the diminished value of interest deductions due to the reduced CIT rate being the main causes. With regard to the years prior to 1999, it needs to be mentioned that investment conditions had already deteriorated for some taxpayers because of more restrictive rules on loss offsets. Provisions on loss offsets, however, cannot be implemented in the Devereux/Griffith model.

Altogether, the *Steuersenkungsgesetz* reduced the average cost of capital over all forms of financing and all types of assets from 7.7% to 7.1%. Especially the alignment and the reduction of the CIT rate improved the investment conditions for businesses. Moreover, the neutrality of the tax system with regard to financing was improved. The relief for equity financing is especially important for young and innovative SMEs which often have problems in acquiring debt financing. On the negative side, the new depreciation rules reduced the relative attractiveness of real investments compared to financial investments. In particular, machinery was affected. It is the only asset type for which the cost of capital increased (from 6.8% to 6.9%).

In the years following the reform in 2001, the cost of capital remained mostly constant until the *Unternehmensteuerreformgesetz* in 2008/09. Only the temporary increase of the CIT rate and the increase of the depreciation rate for movable assets caused small changes, i.e., an increase from 7.1% to 7.2% in 2003 and a reduction from 7.1% to 7.0% in 2006.

The second major tax reform in 2008/09 followed a similar approach as the first one: The tax rate was reduced from 25% to 15% at the cost of a broadened tax base (abolition of the declining balance method of depreciation). Accordingly, the changes in the cost of capital on the corporate level were similar to those occurring in 2001. For equity financing the reduction in the CIT rate outweighed the deterioration of depreciation rules (cost of capital reduced from 8.3% to 7.4%) whereas debt financing was subject to higher cost of capital after the reform (4.7% compared to 4.5%). The value of interest deductions decreased due to the reduced tax rate. On average, the cost of capital was reduced from 7.0% to 6.5%. Moreover, the neutrality with respect to financing was further improved. A substantial difference of 2.7 percentage points in the cost of capital, however, remained between equity and debt financing. Real investments again suffered from more restrictive depreciation rules. Financial assets, in contrast, were unaffected. Lastly, it needs to be noticed that other disadvantageous changes for

taxpayers cannot be modelled. This includes the introduction of the interest barrier (§ 4h EStG, § 8a KStG), the extension of the tax base for trade tax purposes (§ 8 No. 1 GewStG)⁴⁸⁰ and the more restrictive loss trafficking rules (§ 8c KStG) that may be of particular relevance for the founders and acquirers of young, high-growth companies. Start-ups typically incur losses in the early stages of their lifecycle and cannot fully offset them prior to the exit of the original founders. Considering the goal of increasing Germany's long term attractiveness by improving the tax environment for investments, growth and employment, the changes of the tax reform in 2008/09 – at least partly – appear questionable. Especially the discrimination of real investments and the interest barrier as an additional impediment to acquiring finance could entail unwanted effects.

In the years following the reform in 2008, no significant changes in the cost of capital occurred. The temporary re-emergence of the declining balance method for the depreciation of movable assets induced a minor decrease in 2009 and 2010.

Taking the observation period as a whole, the average cost of capital decreased from 7.7% to 6.5%, which represents a substantial improvement of the investment-friendliness of the tax system. In addition, the neutrality with regard to financing was significantly enhanced as the costs of capital for self-financing and new equity were aligned and the disadvantage of equity compared to debt reduced from over five percentage points to 2.7. The main driver of this positive development was the reduction of the CIT rate from 40% and 30%, respectively, to 15%. The broadening of the tax base worked against the reliefs provided by lower tax rates. Above all, real investments were affected by the new depreciation rules which is not ideal with regard to the goals of the reforms: the creation of growth and employment. Further measures which are likely to impede the achievement of these goals cannot be implemented with the Devereux/Griffith model: the interest barrier, restricted loss offsets and loss trafficking rules as well as the broadening of the tax base of the trade tax.

b) Effective Average Tax

Tables 40 and 41 show the effective average tax rate on the corporate level for domestic investments in Germany from 1999 to 2014. As for the cost of capital, the different forms of finance (see Table 40) and the types of assets (see Table 41) are distinguished. The

⁴⁸⁰ The model captures the addition of 25% of the interest expenses but not the addition of parts of the rents and leasing payments incurred by taxpayers.

overall development of the EATR as well as the directions of the separate effects of tax rate and tax base-related measures are similar to the patterns observed for the cost of capital. Most importantly, the average EATR decreased from 40.4% to 28.2%. The attractiveness of Germany as an investment destination has improved. In contrast to the cost of capital, though, the reduction of the tax rate plays a more important role for the EATR. Changes in the tax base do not affect the underlying profitable investment significantly.⁴⁸¹

Table 40: EATR of domestic investment on corporate level in Germany by type of financing (Devereux/Griffith model)

EATR in %	SF	EF	DF	Ø
1999	47.9	41.5	28.4	40.4
2000	47.9	41.5	28.4	40.4
2001	39.8	39.8	28.4	35.8
2002	39.8	39.8	28.4	35.8
2003	41.1	41.1	29.2	37.0
2004	39.8	39.8	28.4	35.8
2005	39.8	39.8	28.4	35.8
2006	39.5	39.5	28.0	35.5
2007	39.5	39.5	28.1	35.5
2008	31.5	31.5	22.1	28.2
2009	31.3	31.3	21.8	28.0
2010	31.3	31.3	21.8	28.0
2011	31.5	31.5	22.1	28.2
2012	31.5	31.5	22.1	28.2
2013	31.5	31.5	22.1	28.2
2014	31.5	31.5	22.1	28.2

Considering the EATRs of the different forms of financing (see Table 40), self-financing experienced a strong relief during the observation period from 1999 to 2014 (from 47.9% to 31.5%). In addition, the EATRs for self-financing and new equity became the same after the tax reform in 2001. Again, the reductions and the alignment of the CIT rate to 25% and later to 15% were the drivers of this development. For debt financing, the EATR remained constant at 28.4% after the reform in 2001 and it decreased significantly after the 2008/09 reform (from 28.1% to 22.1%). Hence, the reduction in the CIT rate fully compensated for the broadening of the tax base or even outweighed the latter for profitable investments financed with equity. This highlights the enhanced role of statutory tax rates for the EATR compared to the tax base. The minimal effect of the temporal re-emergence of the de-

⁴⁸¹ See Section 6.3.

clining balance method for the depreciation of movable assets in 2009/2010 provides further confirmation.

Table 41: EATR of domestic investment on corporate level in Germany by asset type of financing (Deveureux/Griffith model)

EATR in %	Buildings	Intangibles	Machinery	Financial assets	Inventory	Ø
1999	39.9	36.8	37.8	46.8	40.8	40.4
2000	39.9	36.8	37.8	46.8	40.8	40.4
2001	36.6	32.8	35.1	39.2	35.3	35.8
2002	36.6	32.8	35.1	39.2	35.3	35.8
2003	37.7	33.9	36.3	40.5	36.5	37.0
2004	36.6	32.8	35.1	39.2	35.3	35.8
2005	36.6	32.8	35.1	39.2	35.3	35.8
2006	36.6	32.8	33.5	39.2	35.3	35.5
2007	36.7	32.8	33.5	39.2	35.3	35.5
2008	29.2	25.6	28.0	30.7	27.6	28.2
2009	29.2	25.6	26.8	30.7	27.6	28.0
2010	29.2	25.6	26.8	30.7	27.6	28.0
2011	29.2	25.6	28.0	30.7	27.6	28.2
2012	29.1	25.6	28.0	30.7	27.6	28.2
2013	29.1	25.6	28.0	30.7	27.6	28.2
2014	29.1	25.6	28.0	30.7	27.6	28.2

The distinction of different assets also illustrates the significance of the reduced tax rate for profitable investments (see Table 41). Even the EATR of investments in machinery, the asset type being affected the most by less generous depreciation rules, decreased significantly after each reform (by 2.7 percentage points in 2001 and by 5.5 percentage points in 2008).

6.4.1.2 Investor Level

a) Cost of Capital

If investments are undertaken by SMEs, the taxation of capital income at the investor level is likely to be decision-relevant as well. Shareholders of SMEs often rely on the proceeds to make their living. Table 42 shows the development of the cost of capital on the investor level for domestic investments from 1999 to 2014 (which includes the personal income

taxation of capital income as well as the taxes incurred on the corporate level).⁴⁸² On the investor level, the shareholder can either be exempt from income taxes or he can be subject to the maximum marginal tax rate of the personal income tax schedule. For the latter case, investors with a qualified shareholding and with an unqualified shareholding are distinguished⁴⁸³, i.e., three cases in total.

Beginning in 2001, the cost of capital of exempt investors has equaled those on the corporate level. Effectively, there is no taxation of such investors. The values therefore serve as a measuring stick and help to distinguish the effects on the corporate and on the investor level. In 1999 and 2000, the cost of capital on the investor level were smaller than on the corporate level because of the imputation system that granted exempt taxpayers a refund of the corporate income tax withheld on the company level.

Table 42: Cost of capital of domestic investment on investor level in Germany (Devereux/Griffith model)

CoC in %	Exemption	Maximum marginal rate	
		Qualified holding	Unqualified holding
1999	7.4	5.8	3.7
2000	7.4	5.9	3.9
2001	7.1	4.4	3.8
2002	7.1	4.4	3.8
2003	7.2	4.5	3.9
2004	7.1	4.7	4.1
2005	7.1	4.8	4.3
2006	7.0	4.8	4.2
2007	7.0	4.6	4.0
2008	6.5	4.3	3.7
2009	6.4	5.9	5.8
2010	6.4	5.9	5.8
2011	6.5	6.0	5.9
2012	6.5	6.0	5.9
2013	6.5	6.0	5.9
2014	6.5	6.0	5.9

⁴⁸² On the corporate level, the calculations assume a mixture of the different types of assets and financing as described in Section 6.3. So the effects occurring on the corporate level also resurface on the shareholder level but are complemented by the changes on the level of the investor. This section also includes a separate calculation of the cost of capital for each form of financing. The asset types, however, are not examined separately as the differences in the cost of capital would only stem from the effects on the corporate level already discussed before.

⁴⁸³ Currently, a qualified shareholding requires the investor to have held at least 1% of the shares within the five years prior to the disposal of the shareholding. If the requirement is met, the capital gains are considered business income and thus subject to the *Teileinkünfteverfahren*. Otherwise the *Abgeltungsteuer* applies. The taxation of dividends also is affected by the qualification of the holding as a qualified shareholding. For an overview of the previous regimes and a more detailed description of the current differentiation, see Section 6.2.

The development of the cost of capital for non-exempt taxpayers differs completely from the corporate pattern. For qualified shareholdings, the cost of capital decreased significantly from 5.9% to 4.4% in 2001. The reduction, however, was reversed in 2009 when the cost of capital returned to 5.9%. For unqualified holdings, the *Steuersenkungsgesetz* in 2001 did not bring a noticeable change (from 3.9% to 3.8%) whereas the reform in 2008/09 increased the cost of capital from 3.7% to 5.8%, which exceeds the initial level from 1999.⁴⁸⁴ The opposing effects of both reforms also become apparent when distinguishing the different forms of financing (see Table 42). The 2001 reform lowered the cost of capital for self-financing significantly (if the investor holds a qualified shareholding) while the *Unternehmensteuerreformgesetz* in 2008/09 increased the tax burden on both forms of equity finance (i.e., self-financing and new equity).

The effect of the tax reform in 2001, i.e., lowering the cost of capital for qualified shareholders, was mainly driven by the abolition of the imputation system that led to the introduction of the *Halbeinkünfteverfahren*. Under the new regime, 50% of dividends and capital gains were exempt on the investor level while the other half was subject to the progressive PIT rate. For dividends, the change did not lead to a drop in the cost of capital because the 50% exemption of dividends merely compensated for the loss of the previously available imputation of corporate income taxes. Capital gains, however, were fully taxable before the reform and partly exempt (50%) after it. The cost of capital incurred on self-financing was reduced significantly, which also drove the decrease of the cost of capital. The capital gains of investors with unqualified shareholdings, in contrast, were exempt before as well as after the reform.⁴⁸⁵ Hence, no significant change occurred. Exempt investors did not benefit from the newly introduced *Halbeinkünfteverfahren* either as their capital income was fully exempt anyway.

The increase of the cost of capital for non-exempt taxpayers by the *Unternehmensteuerreformgesetz* in 2008/09 (from 4.3% to 5.9% and from 3.7% to 5.8%, respectively) was due to the removal of the *Halbeinkünfteverfahren*. Naturally, exempt taxpayers were not affected. For qualified shareholders, the *Teileinkünfteverfahren* replaced the *Halbeinkünftever-*

⁴⁸⁴ Most of the changes of the *Unternehmensteuerreformgesetz* from 2008 that address the investor level only took effect in 2009. The effects on the cost of capital and the effective average tax rate therefore only occur in 2009 as well.

⁴⁸⁵ If participations were held as private assets, capital gains upon the disposal of shares could only be subject to taxation if the disposal was classified as a gain from so-called speculative transactions (§ 23 EStG a.F.). Such gains were incurred if the underlying shares had not been held for at least one year (until 1999) or six months (from 2000 to 2008), respectively. The model at hand assumes longer holding periods.

fahren. As a consequence, only 40% instead of 50% of dividends and capital gains were exempt. The remainder was subject to the top marginal PIT rate, which caused the increased cost of capital. Shareholders with unqualified holding quotas⁴⁸⁶ were subject to the *Abgeltungsteuer* after 2009, i.e., dividends as well as capital gains were taxed at a proportional rate of 25%. Under the new regime, non-exempt investors were significantly worse off compared to the previously applicable regime (*Halbeinkünfteverfahren* for dividends and full exemption for capital gains). Overall, the increased burden at the investor level exceeded the reductions achieved on the corporate level by the *Unternehmensteuerreformgesetz* in 2008/09. The difference between exempt shareholders being subject to a substantial relief and non-exempt shareholders experiencing the opposite effect also indicates a shift of the tax burden from large to small enterprises as it is mostly institutional and foreign shareholders who are exempt and who tend to invest in larger entities with access to capital markets.

Table 43: Cost of capital of domestic investment on investor level with top personal tax rate in Germany (Deveureux/Griffith model)

CoC in %	Qualified holding				Unqualified holding			
	SF	EF	DF	Ø	SF	EF	DF	Ø
1999	7.3	4.7	3.8	5.8	3.3	5.2	4.3	3.9
2000	7.4	4.7	3.8	5.9	3.3	5.2	4.3	3.9
2001	4.1	4.7	4.9	4.4	2.9	4.8	5.0	3.8
2002	4.1	4.7	4.9	4.4	2.9	4.8	5.0	3.8
2003	4.2	4.8	4.9	4.5	3.0	4.9	5.0	3.9
2004	4.4	5.1	4.9	4.7	3.3	5.2	5.0	4.1
2005	4.7	5.4	4.8	4.8	3.6	5.4	4.9	4.3
2006	4.7	5.3	4.8	4.8	3.6	5.4	4.9	4.2
2007	4.4	5.0	4.8	4.6	3.2	5.1	4.9	4.0
2008	3.9	4.4	4.8	4.3	2.8	4.5	4.9	3.7
2009	6.4	7.4	4.6	5.9	6.3	7.4	4.6	5.8
2010	6.4	7.4	4.6	5.9	6.3	7.4	4.6	5.8
2011	6.5	7.4	4.7	6.0	6.3	7.5	4.7	5.9
2012	6.5	7.4	4.7	6.0	6.3	7.5	4.7	5.9
2013	6.5	7.4	4.7	6.0	6.3	7.5	4.7	5.9
2014	6.5	7.4	4.7	6.0	6.3	7.5	4.7	5.9

Given that SMEs usually feature a small number of shareholders with qualified holding quotas and high personal tax rates, they benefited from the 2001 reform but were disadvantaged by the changes in 2008/09. Only comparing 1999 and 2014, a slight increase of the cost of capital can be observed for this group of investors. By introducing the *Abgeltungsteuer* and

⁴⁸⁶ Qualified holding quotas differ for dividends (25%) and capital gains (1%). A shareholding of 1% may suffice for dividend taxation as well if the shareholder is also an employee of the enterprise.

the *Teileinkünfteverfahren* in 2009, policy-makers clearly thwarted their goal of providing a supportive tax environment for SME investments in Germany. The introduction of the investment reserve and the extended application of accelerated depreciation for micro companies (§ 7g EStG) most likely did not adequately compensate for these disadvantages either as most SMEs are not even eligible (see Section 3.2).⁴⁸⁷

b) *Effective Average Tax Rate*

Table 44 displays the development of the EATR on the investor level. The abolition of the imputation system in 2001 clearly benefited investors with high marginal tax rates. As there was no longer an imputation of corporate income taxes available, the CIT paid on the corporate level became definite. For taxpayers with high PIT rates, this disadvantage was compensated for by the exemption of dividends and capital gains (50%) within the *Halbeinkünfteverfahren*. Exempt taxpayers, on the other hand, did not benefit from the newly introduced relief because they were exempt anyway. As a consequence, the EATRs of the different types of taxpayers approached each other. In 2008, however, they drifted apart again as the *Halbeinkünfteverfahren* was replaced by the *Abgeltungsteuer* and the *Teileinkünfteverfahren*. The advantage of a low personal income tax rate or even an exemption regained importance. The overall effect on the EATR was not as extreme as on the cost of capital, though, because the EATR and the underlying profitable investment were predominantly influenced by the corporate income tax rate. The latter was reduced by the *Unternehmensteuerreformgesetz*, which compensated almost completely for the disadvantages on the investor level.

Distinguishing the three forms of financing (see Table 45) confirms the observations from the cost of capital. The improved neutrality with regard to financing achieved by the 2001 reform, was nullified by the second reform in 2008/09. Comparing new equity with debt financing for qualified holdings, the latter was even more advantaged in 2014 than at the beginning of the sample period. Self-financing was also discriminated against due to the abolition of the tax-exempt status of capital gains. Overall, however, the reduction of the corporate tax rate sufficed to achieve a decrease of the EATR in 2014 compared to 1999.

⁴⁸⁷ Both measures are not included in the calculation of the cost of capital and the EATR because of their limited scope of application.

Table 44: EATR of domestic investment on investor level in Germany (Devereux/Griffith model)

EATR in %	Exemption	Maximum marginal rate	
		Qualified holding	Unqualified holding
1999	24.1	45.0	49.4
2000	24.1	43.9	48.3
2001	35.8	37.2	38.9
2002	35.8	37.2	38.9
2003	37.0	38.1	39.8
2004	35.8	36.9	38.6
2005	35.8	36.7	38.4
2006	35.5	36.6	38.2
2007	35.5	36.8	38.5
2008	28.2	30.7	32.5
2009	28.0	38.7	38.9
2010	28.0	38.7	38.9
2011	28.2	38.9	39.1
2012	28.2	38.9	39.1
2013	28.2	38.9	39.1
2014	28.2	38.9	39.1

Table 45: EATR of domestic investment on investor level with top personal tax rate in Germany (Devereux/Griffith model)

EATR in %	Qualified holding				Unqualified holding			
	SF	EF	DF	Ø	SF	EF	DF	Ø
1999	52.1	47.5	45.8	49.4	43.8	47.9	46.1	45.0
2000	51.2	46.1	44.4	48.3	42.9	46.5	44.7	43.9
2001	38.2	39.6	40.0	38.9	35.0	39.5	39.9	37.2
2002	38.2	39.6	40.0	38.9	35.0	39.5	39.9	37.2
2003	39.2	40.6	40.6	39.8	36.1	40.6	40.6	38.1
2004	38.1	39.6	39.1	38.6	35.1	39.5	39.1	36.9
2005	38.1	39.6	38.4	38.4	35.1	39.6	38.3	36.7
2006	38.0	39.5	38.2	38.2	35.0	39.4	38.2	36.6
2007	38.0	39.4	39.0	38.5	34.9	39.4	38.9	36.8
2008	31.5	33.0	34.0	32.5	28.3	32.8	33.9	30.7
2009	40.3	42.7	35.7	38.9	39.9	42.7	35.7	38.7
2010	40.3	42.7	35.7	38.9	39.9	42.7	35.7	38.7
2011	40.4	42.9	35.9	39.1	40.0	42.9	35.8	38.9
2012	40.4	42.9	35.9	39.1	40.0	42.9	35.8	38.9
2013	40.4	42.9	35.9	39.1	40.0	42.9	35.8	38.9
2014	40.4	42.9	35.9	39.1	40.0	42.9	35.8	38.9

6.4.1.3 Interim Conclusion

The German taxation of corporate businesses has drastically changed since 1999. The dividend imputation system was replaced by the shareholder relief system in 2001. The second major reform in 2008/09 further reduced the tax burden on the corporate level whereas effective tax rates on dividends and capital gains on the investor level increased. Moreover, the *Abgeltungsteuer* was introduced. The overall trend in German business taxation during the sample period is the reduction of tax rates at the cost of a broader tax base. As a consequence, the reduction in effective tax rates primarily benefits profitable businesses.

Interestingly, the effects of the 2001 and 2008/09 reforms are highly dependent on the characteristics of the respective businesses, especially on the form of financing. Temporary progress with regard to financing neutrality was reversed in 2008/09. Currently, debt financing is subject to much lower effective tax rates than equity financing. In the absence of a notional interest deduction on equity or even more fundamental tax reforms, this problem is difficult to overcome on the corporate level. On the shareholder level, however, a more generous taxation of dividends and capital gains could easily alleviate the discrimination of equity financing. With regard to fostering growth and employment, it is also critical that the reduction in effective tax rates can – to a large part – be traced back to financial investments whereas real investments were hit particularly hard by the broadening of the tax base. In addition, frequent changes of depreciation rules impede the planning security of businesses.

The question whether investment conditions in Germany have improved during the last 15 years depends on the relevance of shareholder taxation. On the corporate level, the cost of capital as well as the EATR were reduced significantly. On the investor level, in contrast, the improvement is much less pronounced – if at all existent. This is mostly due to the introduction of the *Abgeltungsteuer* and the *Teileinkünfteverfahren* in their current forms. Overall, the tax burden was redistributed from the corporate to the shareholder level.

For SMEs, the increased taxation of shareholders is especially harmful. Their shareholders are less likely to be exempt from taxation and usually do not have the opportunity to avoid taxation by means of international tax planning (at least not at reasonable costs⁴⁸⁸). Moreover, the shareholders of SMEs often require the income from their businesses to make their living so that the avoidance of shareholder taxation by retaining profits is not feasible

⁴⁸⁸ See Spengel (2003) p. 92.; OECD (2010a) p. 126.

either. These problems are most likely to occur for the very smallest firms. Exactly these companies, however, are those targeted by the investment reserve and the regime of accelerated depreciation introduced in 2008, which exhibits the inconsistency of the German tax policy. Even if the incentives compensate for the general tax-related disadvantages experienced by SMEs after 2008, special provisions make the tax code more complicated. SMEs, of course, are particularly sensitive to compliance costs and suffer the most from additional complexity.

The discrimination against equity financing is another example of a tax policy working against the goal of supporting young and innovative owner-managed companies that are perceived to be the engine of growth for the economy. As discussed above, such businesses often have problems to acquire debt financing and are therefore more reliant on self-financing and new equity. But exactly these forms of financing are heavily disadvantaged whereas established, multi-national companies remain largely unaffected. They have better access to debt and to international capital markets.

6.4.2 *International Comparison of Effective Tax Burdens on Domestic Investments*

6.4.2.1 *Corporate Level*

The above analysis displays the development of the investment conditions in Germany. An international comparison, however, is required to evaluate the true competitiveness of Germany's tax environment. The following section compares the cost of capital and the EATRs of the 28 Member States of the EU and their development from 1999 to 2014. The location of investments has been found to be significantly influenced by tax considerations.⁴⁸⁹ For SMEs, of course, the possibilities of relocating their business activities are often limited compared to large entities. They are mostly forced to stay at their original location even if the tax environment is highly unattractive. Hence, the cost of capital should be the more important measure for many SMEs than the EATR.⁴⁹⁰

⁴⁸⁹ See Devereux/Griffith (2003) pp. 107 ff.; Heckemeyer/Feld (2011) pp. 233 ff.; de Mooij/Ederveen (2008) pp. 680 ff.

⁴⁹⁰ The cost of capital represents the return of a marginal investment whereas the EATR is based on a profitable investment yielding a return in excess of the market return. The EATR therefore is the more important tax-related criterion for starting operations at a certain location. The cost of capital rather impacts on the size of the investment once it has been made.

Nonetheless, the comparison of international effective tax burdens is relevant for SMEs as well. First of all, about half of the German SMEs is involved in cross-border activities.⁴⁹¹ Even if they produce exclusively in Germany, these SMEs are likely to compete in the same markets as businesses from other jurisdictions facing other tax systems and thus other cost of capital.⁴⁹² Moreover, the differentials in effective tax burdens provide insight into the extent to which (large) multinational companies can obtain an advantage over smaller domestic enterprises by relocating some of their activities abroad.⁴⁹³ Such a tax advantage complements the non-tax benefits of internationalization and induces a distortion of competition between domestic and multinational enterprises. Lastly, the comparison improves the understanding of how discriminatory the German tax environment is against SME investments compared to other countries. The discrimination may, for example, emanate from favoring debt over equity financing or from excessive shareholder taxation.

a) Cost of Capital

Table 46 shows the cost of capital on the corporate level in 2014. Germany features comparatively high cost of capital (6.5%) that are exceeded in only four countries (France, Malta, Spain, UK). The EU average is at 6.0% with the EU-15 countries exhibiting substantially higher cost of capital than the EU 13 (6.2% vs. 5.7%). The difference between Germany and the “old Europe” is rather small (0.3 percentage points) whereas the new Member States display significantly lower effective tax burdens on average (0.8 percentage points). From a tax perspective, multinational companies should thus tend to extend investments in other EU countries rather than in Germany. Moreover, enterprises exclusively operating from Germany may find it harder than their foreign counterparts to offer products and services at sufficiently low prices due to an unfavorable tax environment. In today’s international markets – especially in the single market of the European Union – this could be a noticeable competitive disadvantage.

⁴⁹¹ Kranzusch and Holz (2013) estimate 40.5% of micro enterprises to be involved in either direct or indirect international activities in 2012. For small and medium-sized entities, the percentage increases to 71.9% and 82.3%, respectively. See Kranzusch/Holz (2013) p. 37.

⁴⁹² As mentioned in Section 6.3, the cost of capital is an indicator of the long-term price floors of producers. Hence, it provides insight into the competitiveness of the prices at which German SMEs can offer their products or services abroad as well as on domestic markets.

⁴⁹³ The cost of capital and the EATRs of domestic investments only partly describe the attractiveness of an investment location. The tax burden emanating from repatriating the profits also needs to be taken into consideration when evaluating the tax advantage of a multi-national company from relocating activities. In practice, however, the tax burden on repatriating profits is often neglected (as are personal taxes).

Considering the sample as a whole, the cost of capital exceeds the underlying capital market return of 5% in each country in 2014. Consequently, business taxation most likely reduces the volume of real investments compared to financial assets. The results also exhibit the preferential treatment of debt financing that is favored over equity everywhere in the EU. Equity financing is even subject to substantially higher tax burdens in Belgium and Italy, the two countries implementing a notional interest deduction on equity.

Table 46: Cost of capital of domestic investment on corporate level in the EU in 2014 (Devereux/Griffith model)

COC in %	SF	EF	DF	Ø
AUT	6.9	6.9	4.6	6.1
BEL	6.2	6.2	3.9	5.4
BUL	5.6	5.6	4.8	5.3
CRO	6.0	6.0	4.2	5.4
CYP	6.3	6.3	4.9	5.8
CZR	6.2	6.2	4.5	5.6
DEN	6.8	6.8	4.5	6.0
EST	5.0	6.9	5.0	5.2
FIN	6.4	6.4	4.7	5.8
FRA	8.9	9.5	5.6	7.8
GER	7.4	7.4	4.7	6.5
GRE	7.1	7.1	4.6	6.2
HUN	6.6	6.6	4.9	6.0
IRE	6.2	6.2	4.9	5.8
ITA	5.8	5.8	4.6	5.4
LAT	6.1	6.1	4.9	5.7
LIT	6.0	6.0	4.8	5.6
LUX	7.0	7.0	4.1	6.0
MAL	8.2	8.2	4.4	6.8
NED	6.8	6.8	4.5	6.0
POL	6.4	6.4	4.7	5.8
POR	7.4	7.4	4.4	6.3
ROM	6.1	6.1	4.8	5.7
SVK	6.4	6.4	4.5	5.7
SLV	6.2	6.2	4.7	5.7
ESP	8.8	8.8	5.3	7.6
SWE	6.5	6.5	4.6	5.8
UKD	7.3	7.3	5.5	6.7
Ø (EU 28)	6.6	6.7	4.7	6.0
Ø (EU 15)	7.0	7.1	4.7	6.2
Ø (EU 13)	6.2	6.4	4.7	5.7

Table 47 shows the development of the cost of capital in Germany and the EU from 1999 to 2014. Although Germany still exhibits higher cost of capital, the reforms in 2001 and 2008/09 improved Germany's relative position within Europe. The difference compared to the

European average was reduced from 1.4 percentage points in 1999 (7.7% vs. 6.3%) to 0.5 percentage points in 2014 (6.5% vs. 6.0%) and Germany went from featuring the second-highest cost of capital to ranking 23rd among the 28 Member States. From a pure tax perspective, there is still little reason to extend investments in Germany if businesses have the opportunity to do so elsewhere but the competitive disadvantage of enterprises operating from Germany was reduced substantially. Interestingly, the gap could be closed in spite of the lack of reforms since 2008 and the general European trend of reduced cost of capital. In fact, France, Ireland, Italy, Lithuania and Slovenia are the only countries recording an increase in the cost of capital across all three forms of financing.⁴⁹⁴ Most of the EU countries alleviated the discrimination against equity capital during the sample period. The reduction of corporate income tax rates, which led to a devaluation of interest deductions, is the main driver of this development. The general standstill in reform efforts in the last five years is another trend that cannot only be observed in Germany but all across Europe.

Table 47: Cost of capital of domestic investment on corporate level in the EU 1999–2014 (Devereux/Griffith model)

CoC in %	Germany				Ø EU 28 (excl. GER)				Ø EU 15 (excl. GER)				Ø EU 13			
	Ø	SF	EF	DF	Ø	SF	EF	DF	Ø	SF	EF	DF	Ø	SF	EF	DF
1999	7.7	10.4	8.1	3.5	6.3	7.4	7.5	4.3	6.5	7.7	7.7	4.3	6.1	7.1	7.2	4.4
2000	7.7	10.4	8.1	3.5	6.2	7.2	7.3	4.4	6.5	7.7	7.7	4.3	5.9	6.6	6.9	4.5
2001	7.1	8.4	8.4	4.6	6.2	7.2	7.4	4.4	6.5	7.7	7.7	4.3	6.0	6.7	7.0	4.6
2002	7.1	8.4	8.4	4.6	6.3	7.2	7.3	4.5	6.6	7.7	7.7	4.4	5.9	6.7	6.8	4.6
2003	7.2	8.6	8.6	4.6	6.2	7.2	7.2	4.5	6.5	7.7	7.7	4.4	5.9	6.6	6.7	4.6
2004	7.1	8.4	8.4	4.6	6.2	7.0	7.1	4.5	6.5	7.7	7.6	4.4	5.8	6.4	6.6	4.6
2005	7.1	8.4	8.4	4.6	6.1	6.9	7.0	4.6	6.4	7.5	7.5	4.5	5.7	6.2	6.4	4.7
2006	7.0	8.3	8.3	4.5	6.0	6.8	6.9	4.6	6.3	7.3	7.3	4.5	5.7	6.3	6.4	4.6
2007	7.0	8.3	8.3	4.5	6.0	6.7	6.8	4.6	6.3	7.2	7.2	4.5	5.7	6.2	6.4	4.7
2008	6.5	7.4	7.4	4.7	6.0	6.7	6.8	4.6	6.2	7.1	7.1	4.6	5.7	6.2	6.3	4.7
2009	6.4	7.3	7.3	4.6	6.0	6.7	6.8	4.6	6.3	7.2	7.2	4.6	5.7	6.2	6.3	4.7
2010	6.4	7.3	7.3	4.6	5.9	6.6	6.7	4.6	6.2	7.1	7.1	4.6	5.6	6.1	6.3	4.7
2011	6.5	7.4	7.4	4.7	5.9	6.6	6.6	4.6	6.1	7.0	7.0	4.6	5.6	6.1	6.3	4.7
2012	6.5	7.4	7.4	4.7	5.9	6.6	6.7	4.6	6.2	7.0	7.0	4.6	5.6	6.1	6.3	4.7
2013	6.5	7.4	7.4	4.7	5.9	6.6	6.7	4.7	6.2	7.0	7.0	4.7	5.7	6.2	6.3	4.7
2014	6.5	7.4	7.4	4.7	6.0	6.6	6.7	4.7	6.2	7.0	7.1	4.7	5.7	6.2	6.4	4.7

⁴⁹⁴ See Table A9 in Annex 6 for an overview of the cost of capital on the corporate level for each country.

b) *Effective Average Tax Rate*

As described above, the EATR of profitable investments is the more relevant measure when deciding between different investment destinations. Table 48 shows the EATRs of the countries of the European Union from 1999 to 2014. Again, Germany is among the countries with the highest EATRs. The effective average tax rate of 28.2% exceeds the European average by 7.4 percentage points and only three countries exhibit higher values (France, Malta, Spain). The tax environment thus provides little incentives to invest in Germany. Similar to the cost of capital, the average of the EU 15 (24.4%) is significantly higher than the mean EATR of the new Member States (17.0%).

Table 48: EATR of domestic investment on corporate level in the EU in 2014 (Devereux/Griffith model)

EATR in %	SF	EF	DF	Ø
AUT	26.0	26.0	17.3	23.0
BEL	29.3	29.3	21.9	26.7
BUL	10.2	10.2	6.7	9.0
CRO	18.9	18.9	11.9	16.5
CYP	17.2	17.2	11.6	15.2
CZR	19.0	19.0	12.4	16.7
DEN	25.2	25.2	16.7	22.2
EST	15.8	23.1	15.8	16.5
FIN	20.7	20.7	13.9	18.4
FRA	42.6	44.3	33.1	39.4
GER	31.5	31.5	22.1	28.2
GRE	27.2	27.2	18.2	24.1
HUN	21.6	21.6	15.0	19.3
IRE	16.2	16.2	11.0	14.4
ITA	25.5	25.5	21.2	24.0
LAT	16.1	16.1	10.9	14.3
LIT	15.5	15.5	10.2	13.6
LUX	29.1	29.1	18.9	25.5
MAL	36.5	36.5	24.3	32.2
NED	25.6	25.6	16.9	22.6
POL	19.8	19.8	13.2	17.5
POR	30.7	30.7	20.3	27.1
ROM	16.8	16.8	11.2	14.8
SVK	22.1	22.1	14.4	19.4
SLV	17.5	17.5	11.6	15.5
ESP	36.3	36.3	25.9	32.6
SWE	22.0	22.0	14.6	19.4
UK	25.0	25.0	17.7	22.4
Ø (EU 28)	23.3	23.6	16.2	20.8
Ø (EU 15)	27.2	27.4	19.1	24.4
Ø (EU 13)	19.0	19.6	13.0	17.0

The ranking of the EU countries is clearly driven by nominal CIT rates. Countries with high rates, e.g., France, Portugal and Spain, are at the bottom of the ranking while the

Eastern European jurisdictions with very low CIT rates are atop and make up the group of the most attractive investment destinations (only considering taxes). In comparison to the cost of capital rankings, Belgium and Italy take significantly different positions. The notional interest deduction in these two countries significantly reduces the tax burden on marginal investments. Profitable investments, however, yield returns that exceed the notional interest. The excess return is subject to the comparatively high corporate income tax rate, which drives the EATR.

Table 49: EATR of domestic investment on corporate level in the EU 1999–2014 (Devereux/Griffith model)

EATR in %	Germany				Ø EU 28 (excl. GER)				Ø EU 15 (excl. GER)				Ø EU 13			
	Ø	SF	EF	DF	Ø	SF	EF	DF	Ø	SF	EF	DF	Ø	SF	EF	DF
1999	40.4	47.9	41.5	28.4	28.3	32.0	32.1	21.7	29.7	33.6	33.6	22.6	26.8	30.3	30.5	20.8
2000	40.4	47.9	41.5	28.4	26.9	30.1	30.6	20.8	29.5	33.3	33.3	22.4	24.1	26.6	27.8	19.1
2001	35.8	39.8	39.8	28.4	26.3	29.6	30.1	20.2	29.3	33.1	33.1	22.3	23.2	25.8	27.0	17.9
2002	35.8	39.8	39.8	28.4	25.7	29.0	29.2	19.4	29.1	33.0	33.0	22.0	22.0	24.7	25.2	16.7
2003	37.0	41.1	41.1	29.2	24.9	28.1	28.4	18.9	28.8	32.6	32.6	21.7	20.7	23.3	23.8	15.8
2004	35.8	39.8	39.8	28.4	24.0	27.0	27.3	18.2	28.4	32.1	32.1	21.4	19.2	21.5	22.2	14.7
2005	35.8	39.8	39.8	28.4	22.6	25.4	25.7	17.1	27.2	30.8	30.8	20.6	17.6	19.7	20.3	13.5
2006	35.5	39.5	39.5	28.0	22.2	25.0	25.3	17.0	26.5	29.9	29.9	20.3	17.6	19.7	20.4	13.5
2007	35.5	39.5	39.5	28.1	21.6	24.3	24.6	16.6	25.6	28.9	28.9	19.6	17.3	19.4	20.0	13.3
2008	28.2	31.5	31.5	22.1	21.1	23.7	24.0	16.2	25.1	28.2	28.2	19.3	16.8	18.8	19.4	12.8
2009	28.0	31.3	31.3	21.8	21.4	24.0	24.3	16.4	25.4	28.6	28.6	19.5	17.0	19.0	19.6	13.0
2010	28.0	31.3	31.3	21.8	20.7	23.3	23.5	16.0	24.8	27.9	27.9	19.0	16.4	18.3	18.9	12.7
2011	28.2	31.5	31.5	22.1	20.5	22.9	23.2	15.8	24.2	27.2	27.2	18.7	16.5	18.4	18.9	12.7
2012	28.2	31.5	31.5	22.1	20.5	23.0	23.2	15.8	24.4	27.4	27.4	18.8	16.3	18.2	18.8	12.6
2013	28.2	31.5	31.5	22.1	20.9	23.4	23.6	16.2	24.6	27.6	27.6	19.1	16.9	18.8	19.4	13.1
2014	28.2	31.5	31.5	22.1	20.8	23.3	23.6	16.2	24.4	27.2	27.4	19.1	17.0	19.0	19.6	13.0

The development of EATRs during the sample period from 1999 to 2014 resembles the patterns observed for the cost of capital (see Table 49): Except for France and Ireland, the EATRs have generally decreased due to reduced statutory tax rates.⁴⁹⁵ Germany has experienced a significant decrease as well (from 40.4% to 28.2%) but the gap to the majority of European countries has not been closed. Since 2008, no major changes have occurred – neither in Germany nor on the European level. It remains to be seen if this indicates the end of the international tax competition or if the means of competition have simply changed (e.g., IP boxes

⁴⁹⁵ See Table A10 in Annex 6 for an overview of the EATRs on the corporate level for each sample country.

and tax incentives related to the tax base).⁴⁹⁶ With regard to the three sources of finance, the EATRs also reflect the trend of debt financing still being favored throughout Europe. But the advantage over equity financing is smaller in 2014 than around the turn of the millennium (10.3 percentage points in 1999 compared to 7.1 in 2014). In Germany, the difference is comparatively large (9.4 percentage points), which is mainly driven by the high CIT rate.

6.4.2.2 *Investor Level*

a) *Cost of Capital*

Table 50 shows the cost of capital for domestic investments on the investor level, i.e., including company taxation as well as personal income taxes of the investors, in 2014. The model assumes the investors to come from the same country as the company they invest in. The cost of capital on the investor level thus allows inferences about the competitiveness of enterprises competing in the same market but producing in different countries, for which the personal income taxes of the shareholders are relevant. This group of enterprises is mostly made up of SMEs that are owned by a small number of shareholders with qualified holding quotas and high personal income tax rates. Hence, the analysis focusses on the case of non-exempt investors with qualified shareholdings.

At 6.0% Germany exhibits a comparatively high cost of capital in 2014 that is only exceeded by five countries (Hungary, Lithuania, Luxembourg, the Netherlands and Spain). The EU average is 5.5% with no big differences between the EU 15 (5.5%) and the EU-13 countries (5.4%). In some countries, the cost of capital is below the assumed return of a comparable capital market investment (5.0%), which incentivizes real investments rather than investing in financial assets. This phenomenon can be explained by financial investments being disadvantaged with regard to taxes in the respective countries. In Cyprus, for example, income from interest payments is subject to a higher tax rate than dividends and capital gains.

A look at the different forms of financing reveals that no country has a tax system which is completely neutral with regard to debt and equity financing. By trend, debt is favored over equity with Malta being the only country where new equity is the most beneficial source of capital. Foreign competitors thus face similar distortions as German enterprises with regard to financing. Oftentimes, there are multiple reasons for the differences in the cost of

⁴⁹⁶ See Evers/Miller/Spengel (2015) pp. 502 ff.

capital between equity and debt. Not only the level of company taxes matters but also the interplay of the corporate income tax with the taxation of dividends, interest income and capital gains as well as the level of taxes on these three kinds of capital income.

Table 50: Cost of capital of domestic investment on investor level with qualified shareholding in the EU in 2014 (Devereux/Griffith model)

CoC in %	SF	EF	DF	Ø
AUT	6.0	7.0	4.6	5.6
BEL	4.7	7.7	4.0	4.8
BUL	5.4	5.4	4.8	5.2
CRO	6.0	7.4	4.2	5.5
CYP	3.9	5.1	5.0	4.4
CZR	4.9	6.2	4.6	4.9
DEN	5.3	6.9	4.6	5.2
EST	6.0	6.9	5.0	5.7
FIN	5.3	5.9	4.8	5.2
FRA	4.9	5.9	6.0	5.4
GER	6.5	7.4	4.7	6.0
GRE	6.4	6.5	4.6	5.8
HUN	6.6	8.3	4.9	6.2
IRE	4.9	7.9	4.9	5.2
ITA	4.6	5.5	4.6	4.7
LAT	6.1	6.1	4.9	5.7
LIT	6.7	7.4	4.7	6.1
LUX	7.4	8.5	4.1	6.4
MAL	6.7	4.5	4.5	5.7
NED	6.7	7.8	4.5	6.1
POL	5.7	6.4	4.7	5.4
POR	6.2	7.3	4.4	5.7
ROM	5.6	6.2	4.8	5.4
SVK	6.1	4.7	4.5	5.4
SLV	4.1	6.2	4.8	4.5
ESP	8.0	8.9	5.3	7.2
SWE	5.4	6.6	4.6	5.3
UK	4.6	5.5	5.5	5.0
Ø (EU 28)	5.7	6.6	4.7	5.5
Ø (EU 15)	5.7	7.0	4.8	5.5
Ø (EU 13)	5.7	6.2	4.7	5.4

Table 51 shows the development of the cost of capital on the investor level from 1999 to 2014.⁴⁹⁷ The shareholding is assumed to be qualified and held by an individual who is subject to the maximum personal income tax rate. First of all, the European average did not

⁴⁹⁷ See Table A11 in Annex 6 for an overview of the cost of capital on the investor level for each sample country.

change significantly during the observation period (5.6% in 1999 and 5.5% in 2014). For the old and the new Member States, however, opposing trends can be observed: In EU-15 countries the cost of capital on the investor level increased substantially whereas the opposite occurred for the EU-13 states. Insofar, the trends on the investor level clearly distinguish from the corporate level. Germany provided much lower cost of capital to investors in between the two reforms in 2001 and 2008/09 than many other EU countries. As the investor level is especially relevant for SMEs, the tax environment in this time span was particularly favorable for them. Despite emphasizing the importance of the so-called “Mittelstand”, however, Germany gave up the advantage by redistributing the tax burden from the corporate to the investor level. Large enterprises benefited while smaller businesses suffered from increased cost of capital, which reiterates the adverse effect of the *Unternehmensteuerreformgesetz* for SME investments.

Table 51: Cost of capital of domestic investment on investor level with qualified shareholding in the EU 1999–2014 (Devereux/Griffith model)

CoC in %	Germany				Ø EU 28 (excl. GER)				Ø EU 15 (excl. GER)				Ø EU 13			
	Ø	SF	EF	DF	Ø	SF	EF	DF	Ø	SF	EF	DF	Ø	SF	EF	DF
1999	5.8	7.3	4.7	3.8	5.6	6.1	6.9	4.4	4.9	4.9	6.1	4.5	6.3	7.3	7.6	4.4
2000	5.9	7.4	4.7	3.8	5.4	5.7	6.6	4.5	4.9	4.9	6.1	4.5	6.0	6.7	7.2	4.5
2001	4.4	4.1	4.7	4.9	5.6	6.0	6.9	4.5	5.1	5.3	6.5	4.5	6.0	6.7	7.4	4.5
2002	4.4	4.1	4.7	4.9	5.6	6.0	6.8	4.5	5.2	5.4	6.6	4.5	5.9	6.6	7.1	4.6
2003	4.5	4.2	4.8	4.9	5.6	6.1	6.8	4.6	5.2	5.4	6.5	4.6	6.0	6.8	7.1	4.6
2004	4.7	4.4	5.1	4.9	5.5	5.9	6.7	4.6	5.3	5.5	6.6	4.6	5.8	6.4	6.9	4.6
2005	4.8	4.7	5.4	4.8	5.4	5.7	6.5	4.6	5.2	5.3	6.3	4.6	5.6	6.1	6.6	4.7
2006	4.8	4.7	5.3	4.8	5.3	5.6	6.4	4.6	5.2	5.3	6.4	4.6	5.5	6.0	6.3	4.6
2007	4.6	4.4	5.0	4.8	5.5	5.8	6.6	4.7	5.4	5.6	6.8	4.6	5.6	6.1	6.4	4.7
2008	4.3	3.9	4.4	4.8	5.6	5.9	6.7	4.7	5.6	5.8	7.0	4.7	5.6	6.0	6.3	4.7
2009	5.9	6.4	7.4	4.6	5.6	6.0	6.8	4.6	5.6	5.9	7.1	4.6	5.6	6.1	6.5	4.7
2010	5.9	6.4	7.4	4.6	5.6	5.9	6.9	4.7	5.5	5.8	7.2	4.6	5.6	6.0	6.6	4.7
2011	6.0	6.5	7.4	4.7	5.6	5.9	6.9	4.7	5.6	5.8	7.2	4.6	5.6	6.0	6.5	4.7
2012	6.0	6.5	7.4	4.7	5.5	5.8	6.9	4.7	5.6	5.9	7.4	4.6	5.4	5.7	6.3	4.7
2013	6.0	6.5	7.4	4.7	5.5	5.8	6.8	4.7	5.7	6.0	7.4	4.7	5.4	5.6	6.2	4.7
2014	6.0	6.5	7.4	4.7	5.5	5.7	6.6	4.7	5.5	5.7	7.0	4.8	5.4	5.7	6.2	4.7

The difference in the cost of capital between Germany and the European average solely stems from equity financing, in particular the financing through new equity. The respective costs of capital amount to 6.5% (self-financing) and 7.4% (new equity), which exceeds the EU averages by 0.8 percentage points. Debt financing instead is equally burdened as

in the rest of Europe (4.7%). So Germany's tax environment is not only disadvantageous for SMEs in general – due to the high burden at the investor level – but among SMEs, those with problems in obtaining debt finance are even worse off. The group of young and innovative high-risk start-ups typically belongs to the latter. Hence, the basic design of the German tax system is most harmful for those enterprises that are generally perceived to be the most important ones for long-term economic growth.

b) Effective Average Tax Rate

In the ranking of EATRs on the investor level under the assumption of a qualified shareholding being taxed at the maximum personal rate, Germany also exhibits one of the highest values in the EU (39.1%) that exceeds the EU average by 8.8 percentage points (see Table 52). Denmark, France, Ireland and Spain join Germany at the bottom of the ranking⁴⁹⁸ while the EU-13 countries again feature the lowest EATRs due to their low nominal tax rates. Considering the development over the sample period, some differences occur compared to the cost of capital on the investor level (see Table 53). In 1999, Germany's EATR amounted to 49.4%, which was 13.5 percentage points above the EU average. The *Steuersenkungsgesetz* in 2001 decreased the EATR to 38.9% so that the gap was narrowed to 5.6 percentage points. Afterwards no significant changes occurred in Germany⁴⁹⁹ whereas the EATRs in the rest of Europe were lowered by 4 percentage points on average (from 34.3% to 30.3%). The attractiveness of Germany as a destination for profitable investments has thus deteriorated since 2001. It needs to be mentioned, though, that the reduction in EATRs is mainly caused by the EU-13 countries.

In 2001, the discrimination against equity financing was removed so that the EATRs of self-financing and new equity closed in on the European average (only 2.6 and 1.7 percentage points, respectively, above the mean). The 2008/09 reform, however, re-established the advantage of debt financing. As a consequence, the EATRs of all three financing sources exceed European averages significantly and the gap between equity and debt financing is even bigger than in the rest of Europe. Start-ups which have to rely on self-financing and outside

⁴⁹⁸ See Table A12 in Annex 6 for the EATRs of qualified shareholders being taxed at the maximum personal income tax rate for the individual countries of the EU.

⁴⁹⁹ The changes implemented by the 2008 reform neutralized each other almost completely. While the reduction of the CIT rate reduced the EATR at the investor level, the switch from the *Halbeinkünfteverfahren* to the *Abgeltungsteuer* and the *Teileinkünfteverfahren* on the shareholder level had the opposite effect. As the measures on the shareholder level only took effect in 2009, a temporary dip in the EATR occurs in 2008.

equity due to the riskiness of their business therefore encounter a rather unattractive tax environment in Germany.

Table 52: EATR of domestic investment on investor level with qualified shareholding in the EU in 2014 (Devereux/Griffith model)

EATR in %	SF	BF	FF	Ø
AUT	35.3	38.1	31.5	34.3
BEL	36.8	44.2	35.1	36.9
BUL	12.7	12.3	10.1	11.7
CRO	26.8	31.6	20.8	25.2
CYP	17.4	21.7	21.6	19.3
CZR	22.6	27.1	21.4	22.6
DEN	42.4	46.0	41.0	42.3
EST	20.1	23.5	16.3	19.1
FIN	31.9	33.6	30.2	31.5
FRA	49.4	51.1	51.3	50.2
GER	40.4	42.9	35.9	39.1
GRE	31.3	32.0	25.9	29.5
HUN	30.2	35.8	24.6	28.8
IRE	43.3	49.4	43.3	43.9
ITA	33.5	35.9	33.6	33.7
LAT	21.7	22.0	17.3	20.2
LIT	27.4	29.8	20.1	25.1
LUX	40.2	43.2	31.2	37.3
MAL	31.2	24.0	24.0	28.0
NED	37.6	40.8	31.4	35.7
POL	27.9	30.1	24.7	27.0
POR	39.8	42.5	35.1	38.4
ROM	24.0	25.9	21.2	23.2
SVK	20.7	15.4	14.3	17.9
SLV	24.6	31.3	26.8	26.1
ESP	44.8	46.7	39.0	43.0
SWE	34.7	37.7	32.5	34.2
UK	31.9	34.4	34.4	33.0
Ø (EU 28)	31.1	33.6	28.1	30.3
Ø (EU 15)	38.1	41.1	35.4	37.4
Ø (EU 13)	23.6	25.4	20.2	22.6

Table 53: EATR of domestic investment on investor level with qualified shareholding in the EU 1999–2014 (Devereux/Griffith model)

EATR in %	Germany				Ø EU 28 (excl. GER)				Ø EU 15 (excl. GER)				Ø EU 13			
	Ø	SF	BF	FF	Ø	SF	BF	FF	Ø	SF	BF	FF	Ø	SF	BF	FF
1999	49.4	52.1	47.5	45.8	35.9	37.4	39.1	32.7	37.4	37.6	40.3	36.3	34.3	37.2	37.9	28.7
2000	48.3	51.2	46.1	44.4	34.3	35.4	37.4	31.6	37.2	37.4	40.0	36.2	31.2	33.4	34.7	26.7
2001	38.9	38.2	39.6	40.0	34.3	35.6	37.9	31.2	37.6	38.1	40.9	36.0	30.7	32.9	34.7	26.0
2002	38.9	38.2	39.6	40.0	33.5	34.9	37.0	30.4	37.2	37.8	40.5	35.4	29.5	31.7	33.3	25.1
2003	39.8	39.2	40.6	40.6	32.6	34.0	35.9	29.3	36.7	37.3	39.9	35.0	28.1	30.5	31.5	23.3
2004	38.6	38.1	39.6	39.1	31.3	32.5	34.7	28.5	36.5	37.1	39.8	34.7	25.7	27.6	29.2	21.8
2005	38.4	38.1	39.6	38.4	29.7	30.7	32.8	27.2	35.6	36.0	38.6	33.9	23.4	25.1	26.5	20.0
2006	38.2	38.0	39.5	38.2	29.3	30.3	32.3	27.0	35.3	35.7	38.6	33.6	22.9	24.5	25.6	19.8
2007	38.5	38.0	39.4	39.0	29.3	30.5	32.6	26.6	35.2	35.9	38.9	33.1	23.0	24.7	25.8	19.6
2008	32.5	31.5	33.0	34.0	28.9	30.1	32.2	26.1	35.2	36.1	39.1	32.7	22.2	23.7	24.9	19.1
2009	38.9	40.3	42.7	35.7	29.7	31.0	33.2	26.7	36.1	37.1	40.1	33.5	22.8	24.5	25.8	19.4
2010	38.9	40.3	42.7	35.7	30.2	31.3	34.1	27.4	36.7	37.5	41.1	34.2	23.1	24.6	26.5	19.9
2011	39.1	40.4	42.9	35.9	30.1	31.3	33.9	27.4	37.3	38.1	41.6	34.8	22.5	23.9	25.5	19.3
2012	39.1	40.4	42.9	35.9	30.6	31.5	34.3	28.1	38.0	38.8	42.3	35.4	22.6	23.7	25.8	20.1
2013	39.1	40.4	42.9	35.9	30.9	31.8	34.5	28.6	38.4	39.2	42.6	35.9	22.9	23.8	25.8	20.7
2014	39.1	40.4	42.9	35.9	30.3	31.1	33.6	28.1	37.4	38.1	41.1	35.4	22.6	23.6	25.4	20.2

6.4.2.3 Interim Conclusion

The comparison of the cost of capital and the EATRs of Germany and the other countries in the European Union indicates that Germany – from a pure tax perspective – is not an attractive investment destination. On the corporate as well as on the investor level effective tax burdens are among the highest in the European Union and do not provide incentives to start or extend operations in Germany. For SMEs, the above-average tax burden poses the threat of deteriorated competitiveness with enterprises from other countries featuring lower cost of capital and lower effective tax rates. SMEs are even more affected by this disadvantage than large entities as they often do not have the opportunity to relocate their operations. Moreover, they do usually not have access to international capital markets, which exposes them to investor-level taxes. The latter are another driver of high effective tax burdens in Germany, in particular since 2009. Lastly, the analysis reveals that almost all countries treat debt more favorably than equity financing and that this problem is hard to overcome – even if a notional interest deduction is granted on equity. Still, the discrimination of equity is more pronounced in Germany than in the majority of Member States, which is closely related to the comparatively high nominal tax rates in Germany that drive the value of the interest deductions.

Considering the time trend from 1999 to 2014, Germany exhibits above average cost of capital and EATRs on both the corporate and the investor level throughout the sample period. While the gap becomes smaller on the corporate level due to reductions of the CIT rate, the 2008/09 reform prevents a similar, clear-cut trend on the investor level. While the EATR also decreases, the development of the cost of capital goes in the opposite direction. The reduced CIT rate plays a lesser role for marginal investments and cannot compensate for the additional burden induced by the *Abgeltungsteuer* and the *Teileinkünfteverfahren*.

6.4.3 *Cost of Capital and Effective Average Tax Rate for Cross-Border Investments*

6.4.3.1 *Extension of the Model*

The analysis of cross-border investments requires an extended framework of the model company and the investment project (see Figure 16). It assumes the investment to be undertaken by a legally independent subsidiary that is exclusively owned by a parent company in another country. From a German point of view, investments can either be made by a German parent company through a foreign subsidiary (outbound investments) or by a foreign company through a German subsidiary (inbound investments). Each EU Member State is considered as a potential location either for the parent or the subsidiary. Similar to the parent company, the subsidiary can obtain capital through self-financing, new equity or debt financing. Accordingly, the returns are repatriated as either capital gains, dividends or interest payments.

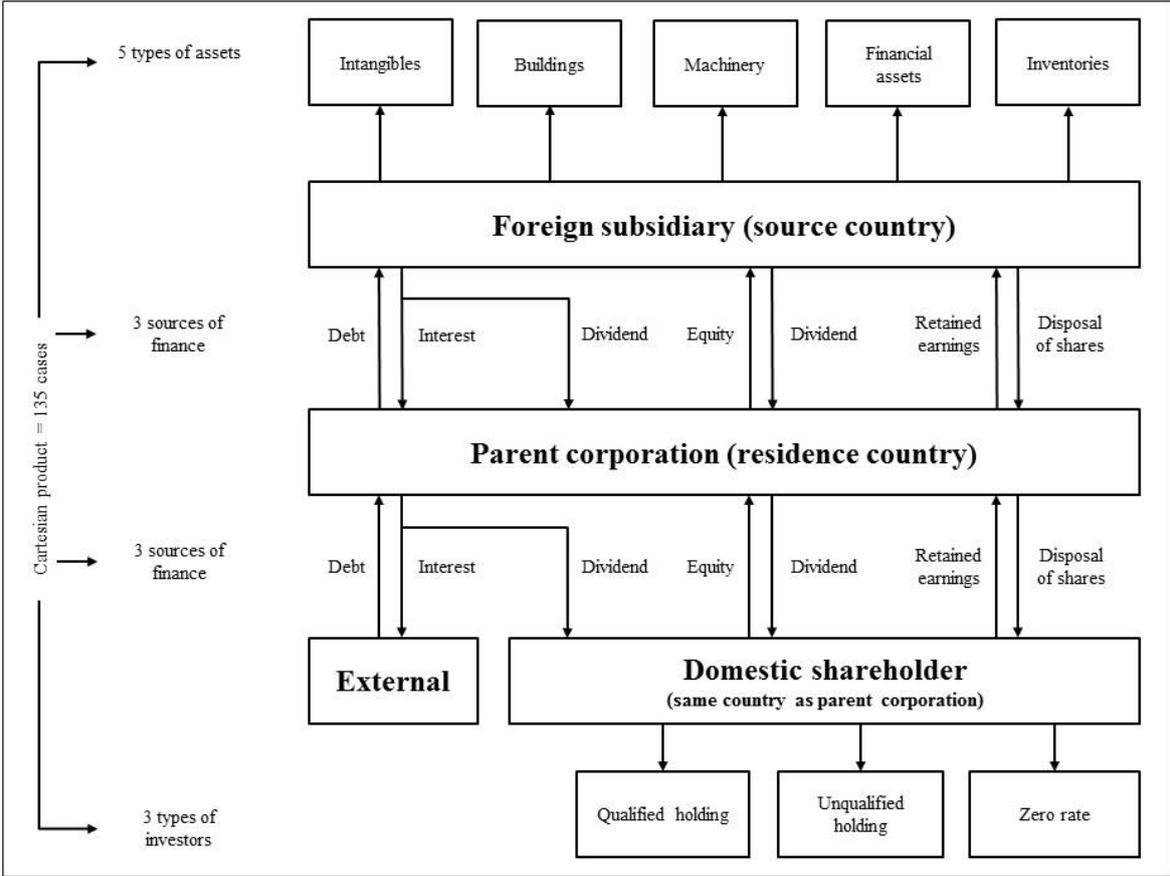
In order to comprehensively model the tax-related consequences of cross-border investments, the calculations have to include the national legislation on foreign business activities as well as the provisions from double tax treaties.⁵⁰⁰ In addition, a multitude of possible combinations of assets and financing options emerge. For the sake of simplicity and clarity, the analysis assumes the same mixture of assets for the subsidiary and the same weights of equity and debt financing for the parent company as in the domestic case. The financing of the subsidiary, in contrast, is not fixed. It is an important instrument for tax optimization. The cost of capital and EATRs are therefore given separately for each of the three financing options. With regard to the different levels of taxation, the analysis only considers the corporate levels, i.e., the taxes incurred by the subsidiary and the parent company, whereas personal

⁵⁰⁰ For the extension of the calculation formulas of the Devereux/Griffith model for cross-border investments see Devereux/Griffith (1999) pp. 1 ff.; Spengel (2003) pp. 134 ff.; Lammersen (2005) pp. 250 ff.

taxes on the investor level are neglected. As they only capture the costs of refinancing the parent company, personal taxes do not influence the actual decision where to locate a subsidiary.

The analysis of cross-border investments enables a more meaningful evaluation of the attractiveness of Germany as an investment destination than the comparison of the cost of capital and the EATRs of purely domestic investments. A tax burden on domestic investments that is significantly higher than on outbound investments signals a very unattractive tax environment for investors. Vice versa, a low tax burden on inbound investments compared to domestic investments in the other EU Member States indicates the German tax system to incentivize investments. With regard to SMEs, the results provide an indication whether operating exclusively from Germany induces a severe tax-related disadvantage compared to larger multinationals.

Figure 16: Framework for cross-border investments (Devereux/Griffith model)



6.4.3.2 Outbound-Investments

a) Cost of Capital

Table 54 shows the development of the cost of capital for outbound investments of a German parent company in a foreign subsidiary in the EU. The weighted average (55% self-financing, 10% new equity and 35% debt financing) as well as separate values for the three possible sources of finance of the subsidiary are given. The cost of capital is displayed as an average for outbound investments in each country of the EU, EU 15 and EU 13, respectively, and compared to the case of a purely domestic investment in Germany.⁵⁰¹

Table 54: Cost of capital of outbound investment of German parent company 1999–2014 (Devereux/Griffith model)

CoC in %	Ø EU 28				Ø EU 15				Ø EU 13				GER
	Ø	SF	EF	DF	Ø	SF	EF	DF	Ø	SF	EF	DF	Ø
1999	6.5	5.4	6.1	8.1	6.6	5.7	6.1	8.1	6.4	5.1	6.0	8.1	7.7
2000	6.4	5.2	5.9	8.0	6.6	5.7	6.0	8.0	6.2	4.7	5.8	8.1	7.7
2001	6.6	6.0	6.6	7.3	6.8	6.4	6.6	7.3	6.5	5.6	6.5	7.4	7.1
2002	6.6	6.1	6.5	7.3	6.9	6.5	6.7	7.3	6.4	5.6	6.3	7.3	7.1
2003	6.6	5.9	6.4	7.4	6.8	6.4	6.6	7.4	6.3	5.4	6.2	7.4	7.2
2004	6.5	5.9	6.3	7.3	6.8	6.4	6.6	7.4	6.2	5.3	6.0	7.2	7.1
2005	6.4	5.8	6.1	7.2	6.7	6.3	6.5	7.4	6.0	5.2	5.6	7.1	7.1
2006	6.3	5.7	6.0	7.2	6.6	6.1	6.3	7.4	6.0	5.2	5.6	7.1	7.0
2007	6.3	5.6	5.9	7.2	6.5	6.0	6.2	7.4	6.0	5.2	5.5	7.1	7.0
2008	6.1	5.8	6.0	6.7	6.4	6.2	6.3	6.7	5.8	5.4	5.6	6.6	6.5
2009	6.1	5.8	6.0	6.6	6.4	6.2	6.4	6.7	5.8	5.4	5.6	6.5	6.4
2010	6.1	5.7	5.9	6.6	6.4	6.1	6.3	6.7	5.8	5.3	5.6	6.6	6.4
2011	6.1	5.7	5.9	6.6	6.3	6.0	6.2	6.7	5.8	5.3	5.6	6.6	6.5
2012	6.1	5.7	5.9	6.6	6.3	6.1	6.2	6.7	5.8	5.3	5.6	6.6	6.5
2013	6.1	5.7	6.0	6.7	6.4	6.1	6.3	6.8	5.9	5.3	5.7	6.6	6.5
2014	6.1	5.7	6.0	6.7	6.4	6.1	6.3	6.8	5.9	5.4	5.7	6.6	6.5

During the whole sample period the cost of capital of domestic investments in Germany has exceeded the average cost of capital of outbound investments in the European Union. Hence, German enterprises with foreign subsidiaries are incentivized to extend their investments abroad rather than their domestic activities. The gap, however, was reduced significantly from 1.2 percentage points in 1999 to 0.4 percentage points in 2014. Due to the low average CIT rates in other EU countries, self-financing is usually the tax-efficient way to fi-

⁵⁰¹ The results for the domestic investment are taken from Table 38.

nance the subsidiary. Only considering this option, the gap between a domestic investment in Germany and an outbound investment narrowed from 2.3 percentage points in 1999 to 0.8 percentage points in 2014.

The cost of capital of domestic investments converge towards those of outbound investments because of the reduction of the CIT rate in 2001 and 2008. The *Steuersenkungsgesetz* in 2001 also led to increased cost of capital for outbound investments because only 95% of dividends paid to the German parent have been exempt since 2001 (§ 8b Abs. 5 KStG) while they were fully tax-free before. Additionally, equity financing experienced an increase in the cost of capital in 2001 because – in face of a reduced CIT rate – the tax savings from deducting the interest paid for refinancing the investment on the level of the parent company have diminished. Debt financing, in contrast, became more advantageous due to the reduced CIT rate. Interest payments made by the subsidiary were only subject to a tax rate of 25% instead of 30% or even 40% after the *Steuersenkungsgesetz*. Similar effects occur for the *Unternehmensteuerreformgesetz* of 2008/09 that also decreased the CIT rate (from 25% to 15%). Accordingly, the cost of capital of outbound investments increased slightly for equity financing and decreased for debt. The average went down from 6.3% to 6.1%. Further factors contributing to these movements include the reduction of CIT rates in the other Member States and the modification of the tax base of the German trade tax.⁵⁰²

b) *Effective Average Tax Rate*

The development of the EATR of outbound investments confirms the patterns observed for the cost of capital (see Table 55). The tax burden on domestic investments has been higher than the burden on outbound investments throughout the sample period although a substantial reduction of the gap was accomplished (from 17.1 percentage points in 1999 to 5.9 percentage points in 2014). German companies are thus incentivized to open a subsidiary abroad rather than to start additional domestic activities. Comparing the EATRs in 1999 and 2014 reveals that the EATR did not change significantly for outbound investments whereas the EATR for domestic investments decreased by 12.2 percentage points (from 40.4% to 28.2%). Self-financing is also the tax-efficient source of capital for the subsidiary when con-

⁵⁰² After the reform in 2008, the tax base only includes 25% instead of 50% of the interest paid for refinancing the investment in the subsidiary.

sidering profitable investments (EATR of 20.8% compared to 21.6% and 24.6% incurred when obtaining new equity or debt).

In 2001, the EATR increased from 21.5% to 29.6% for outbound investments while the EATR of domestic investments dropped by almost 5 percentage points (from 40.4% to 35.8%). This development was driven by the reduction of the exemption of dividends from foreign subsidiaries from 100% to 95% (§ 8b Abs. 5 KStG) and the CIT rate cut which lowered the value of interest deductions incurred for refinancing the investment. The latter effect, however, played a lesser role for profitable than for marginal investments. Instead, the rise of the EATR occurred due to an assumption underlying the model. According to this assumption the returns of the investment are reinvested on the level of the parent company whereas the distributions to shareholders are derived from domestic activities. As a consequence, even foreign investments induced a refund under the split CIT rate in 1999 and 2000 if returns were distributed to investors. The refund enhanced the value of the investment and thus reduced the EATR. As the 2001 reform removed the split CIT rate this model-based effect vanished and the EATR increased. Insofar, the jump of the EATR most likely is not representative of the actual effect on businesses' investment incentives and needs to be interpreted carefully. In 2008, the EATR dropped for debt-financed outbound investments (from 27.4% to 24.6%) and remained almost the same for equity financing. Overall, the EATR dropped from 23.7% to 22.6%. The changes can mainly be traced back to the cut of the CIT rate from 25% to 15% and the abovementioned consequences on the taxation of capital gains, dividends and interest income on the level of the parent company as well as the reduced value of interest deductions incurred for refinancing the investment. As in the period between the two reforms, the tax rate reductions in the other EU Member States also contributed to the reduction of the EATR.

Although the reforms of 2001 and 2008/09 reduced the tax burden on domestic investments on the corporate level, marginal as well as profitable investments are still subject to lower effective tax rates if undertaken in other EU countries. The low CIT rates in many Member States are the main reason for the disadvantage of domestic investments. The *Steuersenkungsgesetz* of 2001 and the *Unternehmensteuerreformgesetz* of 2008/09 only narrowed the gap in nominal CIT rates but did not close it. The tax system therefore encourages enterprises to start and extend business activities abroad rather than in Germany. Given that SMEs often only have operations in Germany, this is another disadvantage they face in the competition with large multi-national companies.

Table 55: EATR of outbound investment of German parent company 1999–2014 (Devereux/Griffith model)

EATR in %	Ø EU 28				Ø EU 15				Ø EU 13				GER
	Ø	SF	EF	DF	Ø	SF	EF	DF	Ø	SF	EF	DF	Ø
1999	23.3	19.1	21.5	29.4	23.8	20.3	21.8	29.4	22.8	17.8	21.2	29.3	40.4
2000	21.5	17.0	19.5	28.1	22.9	19.5	20.6	28.6	20.0	14.2	18.3	27.5	40.4
2001	29.6	27.4	29.4	32.1	31.1	29.8	30.5	33.0	28.0	24.8	28.1	31.2	35.8
2002	29.0	26.9	28.6	31.4	31.0	29.8	30.5	32.7	26.8	23.9	26.5	30.1	35.8
2003	28.3	25.9	27.6	31.2	30.7	29.3	30.0	32.8	25.7	22.4	25.1	29.5	37.0
2004	26.9	24.6	26.1	29.8	30.3	28.9	29.6	32.2	23.2	20.0	22.3	27.3	35.8
2005	24.7	22.5	23.6	28.1	29.1	27.6	28.3	31.3	20.0	17.0	18.4	24.6	35.8
2006	24.4	22.1	23.1	28.0	28.4	26.8	27.5	31.1	20.1	17.1	18.5	24.6	35.5
2007	23.7	21.3	22.3	27.4	27.5	25.8	26.4	30.4	19.5	16.5	17.8	24.2	35.5
2008	22.6	21.2	22.0	24.6	26.5	25.6	26.2	27.6	18.4	16.4	17.5	21.3	28.2
2009	22.8	21.5	22.3	24.7	26.8	26.0	26.5	27.8	18.5	16.6	17.7	21.4	28.0
2010	22.2	20.7	21.6	24.3	26.1	25.3	25.8	27.3	18.0	15.9	17.0	21.1	28.0
2011	22.0	20.4	21.2	24.2	25.6	24.6	25.2	27.0	18.0	15.9	17.0	21.2	28.2
2012	22.1	20.6	21.4	24.3	25.8	24.8	25.3	27.1	18.2	16.0	17.2	21.3	28.2
2013	22.5	20.9	21.8	24.7	26.0	25.0	25.5	27.4	18.7	16.6	17.8	21.7	28.2
2014	22.3	20.8	21.6	24.6	25.8	24.7	25.3	27.4	18.5	16.6	17.6	21.4	28.2

6.4.3.3 Inbound Investments

a) Cost of Capital

Table 56 shows the development of the average cost of capital of inbound investments of a foreign parent company from EU Member States in a German subsidiary. The average cost of capital of domestic investments in the Member States (excluding Germany) serves as a measuring stick for the attractiveness of inbound investments in Germany.⁵⁰³

During the whole sample period the average cost of capital of inbound investments in Germany has exceeded the cost of capital of purely domestic investments in other Member States. Hence, foreign companies are incentivized to extend operations in their residence countries rather than in Germany. Since 1999, the disadvantage of the inbound investment has diminished by more than 50%, though (from 1.3 percentage points to 0.6 percentage points). Due to the comparatively high CIT rate in Germany, debt financing is the tax-efficient way to finance inbound investments. The interest payments reduce the profits to be taxed in Germany and instead are subject to the CIT rate of the parent company. As a result of the tax rate cuts

⁵⁰³ The numbers correspond to the EATRs in Table 47. For the investment in a foreign company only the weighted cost of capital across all forms of financing (55% self-financing, 10% outside equity, 35% debt financing) are presented.

in 2001 and 2008, the edge of debt financing was reduced but not completely removed (because average foreign CIT rates are still lower).⁵⁰⁴ Even using debt finance, however, domestic investments in other EU countries exhibit a slight advantage over inbound investments in 2014 (6.2% compared to 6.3%). Interestingly, debt-financed inbound investments held the advantage before the 2001 reform (6.0% compared to 6.2%). The overall effect of the *Steuersenkungs-gesetz* and the *Unternehmensteuerreformgesetz* on inbound investment activity from foreign companies is therefore not clear. It is highly dependent on the financing mix chosen for German subsidiaries. In this respect, the add-back of interest payments (25%) to the tax base of the trade tax and the interest barrier need to be highlighted as impediments to debt-financed inbound investments.

Table 56: Cost of capital of inbound investment in German subsidiary 1999–2014 (Devereux/Griffith model)

CoC in %	Ø Inbound EU 28				Ø Inbound EU 15				Ø Inbound EU 13				EU 28 (domestic)
	Ø	SF	BF	FF	Ø	SF	BF	FF	Ø	SF	BF	FF	Ø
1999	7.6	9.1	7.5	6.2	7.4	8.8	7.1	6.3	7.8	9.5	7.9	6.0	6.3
2000	7.6	9.3	7.7	5.8	7.4	9.2	7.0	6.1	7.8	9.5	8.3	5.5	6.2
2001	7.4	7.5	8.0	6.8	7.3	7.3	7.4	7.1	7.6	7.7	8.7	6.5	6.2
2002	7.5	7.5	8.0	6.9	7.4	7.4	7.5	7.2	7.6	7.6	8.7	6.5	6.3
2003	7.6	7.7	8.3	6.8	7.5	7.6	7.6	7.2	7.7	7.8	8.9	6.4	6.2
2004	7.3	7.6	7.8	6.7	7.3	7.4	7.4	7.1	7.4	7.9	8.2	6.2	6.2
2005	7.3	7.6	7.8	6.5	7.2	7.3	7.4	7.0	7.4	7.9	8.3	6.0	6.1
2006	7.2	7.5	7.7	6.4	7.1	7.2	7.3	6.8	7.3	7.8	8.1	5.9	6.0
2007	7.1	7.5	7.6	6.3	7.1	7.3	7.3	6.7	7.2	7.8	7.8	5.9	6.0
2008	6.6	6.7	6.8	6.2	6.5	6.5	6.6	6.6	6.6	7.0	7.0	5.8	6.0
2009	6.5	6.6	6.7	6.2	6.5	6.4	6.5	6.5	6.5	6.9	6.9	5.8	6.0
2010	6.5	6.7	6.7	6.1	6.5	6.5	6.5	6.5	6.5	6.9	6.9	5.7	5.9
2011	6.6	6.7	6.8	6.1	6.5	6.5	6.6	6.5	6.6	7.0	7.0	5.8	5.9
2012	6.6	6.8	6.8	6.1	6.5	6.5	6.6	6.5	6.6	7.0	7.1	5.8	5.9
2013	6.6	6.8	6.8	6.2	6.5	6.5	6.6	6.5	6.6	7.0	7.1	5.8	5.9
2014	6.6	6.8	6.8	6.2	6.5	6.5	6.6	6.5	6.6	7.0	7.0	5.8	6.0

⁵⁰⁴ Only inbound investments financed with new equity or retained profits benefit from the cut of the CIT rate as the profits of the subsidiary are taxed at a lower rate before being repatriated. For debt-financed investments, in contrast, the interest payments can be deducted from the tax base of the subsidiary anyway. The beneficial effect of the deduction decreases as a consequence of the diminished tax wedge, which explains the increase in the cost of capital for debt financing in 2001 (from 5.8% to 6.8%). In 2008, the slight reduction even for the debt scenario can be explained by the modification in the tax base of the trade tax (addition of 25% of interest payments to the tax base instead of previously 50%).

b) *Effective Average Tax Rate*

Table 57 presents the development of the EATR of inbound investments of EU parent companies in German subsidiaries. As a comparison, the average EATR of domestic investments in the Member States (excluding Germany) is also given.⁵⁰⁵

Table 57: EATR of inbound investment in German subsidiary 1999–2014 (Devereux/Griffith model)

EATR in %	Ø Inbound EU 28				Ø Inbound EU 15				Ø Inbound EU 13				EU 28 (domestic)
	Ø	SF	BF	FF	Ø	SF	BF	FF	Ø	SF	BF	FF	Ø
1999	41.7	46.1	41.5	37.5	39.8	44.8	38.6	36.1	43.7	47.5	44.6	39.0	28.3
2000	42.0	46.6	42.0	37.4	39.8	44.7	38.6	36.0	44.4	48.6	45.7	38.9	26.9
2001	39.0	39.1	40.5	37.3	36.5	36.7	36.9	35.8	41.7	41.7	44.4	38.9	26.3
2002	38.8	38.9	40.3	37.1	36.8	37.0	37.1	36.2	40.9	41.0	43.7	38.1	25.7
2003	39.9	40.3	41.7	37.7	37.9	38.3	38.5	36.9	42.0	42.3	45.1	38.5	24.9
2004	37.5	38.3	38.8	35.5	36.6	36.8	36.9	36.0	38.6	39.9	40.8	35.1	24.0
2005	37.4	38.3	38.8	35.2	36.4	36.7	36.8	35.7	38.5	40.0	40.9	34.6	22.6
2006	37.0	37.9	38.4	34.7	36.0	36.4	36.5	35.1	38.1	39.6	40.5	34.3	22.2
2007	36.4	37.6	37.7	34.0	36.0	36.5	36.6	34.8	36.9	38.7	38.9	33.2	21.6
2008	29.2	29.7	29.9	27.9	28.7	28.6	28.8	28.6	29.7	30.9	31.0	27.1	21.1
2009	29.0	29.5	29.7	27.9	28.7	28.5	28.8	28.7	29.4	30.6	30.8	26.9	21.4
2010	28.9	29.5	29.6	27.6	28.4	28.4	28.5	28.4	29.4	30.7	30.8	26.7	20.7
2011	29.1	29.7	29.9	27.7	28.6	28.6	28.8	28.4	29.6	30.9	31.1	26.9	20.5
2012	29.1	29.8	29.9	27.7	28.6	28.6	28.8	28.4	29.7	31.1	31.2	26.9	20.5
2013	29.2	29.8	30.0	27.7	28.6	28.7	28.8	28.4	29.8	31.1	31.2	27.0	20.9
2014	29.2	29.9	29.9	27.7	28.8	28.9	29.0	28.5	29.6	30.9	30.9	26.9	20.8

During the whole period from 1999 to 2014 the EATR of inbound investments from the EU has exceeded the average EATR of domestic investments in the respective countries. The gap, however, narrowed from 13.4 percentage points (41.7% compared to 28.3%) to 8.4 percentage points (29.2% compared to 20.8%). The same trend appears when considering debt financing separately (a difference of 9.2 percentage points in 1999 compared to 6.9 in 2014). The latter is also the most beneficial source of capital of a German subsidiary if profitable investments are undertaken. Hence, the attractiveness of founding a German subsidiary has increased since 1999. Domestic investments in the EU Member States, however, are still more beneficial from a pure tax perspective.

⁵⁰⁵ The numbers are taken from Table 49.

6.4.3.4 *Interim Conclusion*

The analysis of effective tax burdens for cross-border investments from 1999 to 2014 shows Germany's improved attractiveness as an investment destination. The comparison of domestic investments in Germany and outbound investments in the EU reveals that the tax advantage of founding new subsidiaries abroad as well as extending foreign business activities there has significantly diminished for German parent companies since 1999. Moreover, the analysis for inbound investments displays the foundation of new subsidiaries in Germany to be more beneficial for foreign enterprises compared to 1999. The results for the extension of already existing operations are mixed: The cost of capital of inbound investments over all three forms of financing has approached the cost of capital for domestic investments in other EU countries but debt financing – the tax-efficient source of capital – has not benefited from the reforms.

The positive trend is mainly driven by the CIT rate cuts in 2001 and 2008. However, investments abroad are still subject to lower effective tax rates than investments in Germany. There is still a competitive disadvantage emanating from the comparatively high level of the income taxes on corporate income at a rate of about 30% (15% corporate income tax about 15% trade tax). This rate would have to be further reduced in order to make Germany an equally or even more attractive investment destination than most other EU countries. The limited deductibility of interest payments within the German trade tax is another factor potentially impeding the attraction of inbound investments. It negatively affects subsidiaries financed with debt, which is especially critical as debt financing is the tax-efficient way of providing German subsidiaries with capital from the EU.

6.4.4 *Taxation of Transparently Taxed Enterprises*

The major limitation of the above analysis is the exclusive focus on corporate businesses. The majority of German enterprises – especially in the SME sector – are non-corporate entities such as partnerships and sole proprietorships, though.⁵⁰⁶ Hence, an overview of the most important consequences for transparently taxed enterprises is required for a comprehensive evaluation of the 2001 and 2008/09 reforms.

⁵⁰⁶ In 2013, 18.2% of German SMEs were corporations, 13.5% were partnerships and 68.5% were sole proprietorships. See Statistisches Bundesamt: <https://www.destatis.de/DE/ZahlenFakten/GesamtwirtschaftUmwelt/UnternehmenHandwerk/Unternehmensregister/Tabellen/UnternehmenRechtsformenWZ2008.html#Fussnote2> (retrieved on July 20, 2016).

In Germany, income from partnerships and sole proprietorships is usually subject to the trade tax and the progressive personal income tax on the level of the owner as soon as it accrues.⁵⁰⁷ The partnership (or sole proprietorship) itself is not regarded a taxable entity. Only the owners are subject to income taxation. The investor-level tax burdens of corporations therefore represent the appropriate measuring stick for investments in transparently taxed businesses. The provisions on the determination of taxable income are mostly the same for corporate and non-corporate enterprises.⁵⁰⁸ Hence, both types of businesses are equally affected by the modifications of depreciation rules during the sample period from 2000 to 2014. Different effects of the 2001 and the 2008/09 reforms on effective tax burdens can therefore only stem from statutory tax rates and the interaction of the trade tax and the income tax (see Table 58).

Before the *Steuersenkungsgesetz* in 2001, partnership income was subject to a lower (combined) statutory tax rate than corporate income that is distributed as a dividend. The advantage stems from a limited PIT rate of 43% for business income in 2000. Dividends, in contrast, were taxable at the full PIT rate of 51%. Accordingly, the cost of capital and the EATR of transparently taxed entities should be significantly lower than for corporate investments financed with new equity.⁵⁰⁹ The 2001 reform removed the cap of PIT rate at 43% for business income but the imputation of the trade tax payable to the personal income tax and the reduction of the general PIT rate outweigh this disadvantage. As a result, the combined statutory tax rate decreased and was still below the respective corporate rate after 2001. In fact, the advantage became even bigger in the following years as the top PIT rate dropped even further to 42%.

The 2008 reform, in contrast, significantly increased the effective tax burden of sole proprietorships and partnerships as a broadening of the tax base (i.e., more restrictive depreciation rules) was complemented by an increase in the overall statutory tax rate (from 46.3% to 48.4%). The raise was caused by the increase of the applicable personal income tax rate (the PIT cap was re-introduced in 2006 and again abolished in 2008) and the abolition of the trade

⁵⁰⁷ The *Unternehmensteuerreformgesetz* in 2008 also introduced the option of profit retention for transparently taxed entities. The retained profits, however, are immediately subject to trade tax and a reduced PIT rate. Upon distribution, the profits are taxed again.

⁵⁰⁸ Only the very smallest non-corporate businesses have the option to apply an adjusted form of cash accounting to determine income (§ 4 Abs. 3 EStG).

⁵⁰⁹ A similar study indeed finds lower cost of capital and a lower EATR for partnerships before the *Steuersenkungsgesetz* in 2001 as well as after the reform in 2001 and 2005. See Sachverständigenrat (2001) pp. 303 ff.

tax deduction in the PIT base. Both factors outweigh the positive effect of the increase of the amount of imputed trade tax (multiplier of 380% instead of 180%).

Given the tax rate cut for alternative capital market investments, the cost of capital and the EATR of investments in transparently taxed entities can be assumed to have experienced a significant increase in 2008. The advantage in nominal tax rates of non-corporate legal forms over corporate entities disappeared for the most part as well. The combined statutory rate for corporations exceeds the overall statutory burden on partnerships only by 0.7 percentage points in 2009 (see Table 58). Moreover, the option to provide shareholder debt instead of equity – that is not available for transparently taxed businesses and their owners – has become more valuable because interest income is now subject to the *Abgeltungsteuer* (25%) on the investor level (unless the investor owns more than 10% of the company's share capital). As an advantage for sole proprietorships and partnerships, they have the opportunity to retain profits since the *Unternehmensteuerreformgesetz* in 2008. Under the new regime, retained profits are subject to a reduced PIT rate of 28.25% when they accrue. However, a deferred taxation at 25% kicks in upon distribution. Obviously, the combined rate (28.25% plus 25%) is comparatively high so that the regime is only attractive under very specific circumstances (high marginal tax rate, long re-investment horizon) and provides very limited relief for the otherwise disadvantageous changes for transparently taxed entities in 2008.⁵¹⁰

Altogether, the trends observed for transparently taxed businesses confirm the results from the quantitative analysis for corporate entities. The 2001 reform improved the investment attractiveness of the German tax system whereas the 2008 reform had the opposite effect. For sole proprietors and partnerships – or rather their owners – the deterioration in 2008 was even worse than for the shareholders of corporations. Hence, the mostly non-corporate SME sector has been confronted with a particularly adverse tax environment in Germany since 2008.

⁵¹⁰ Given a pre-tax rate of return of 5% and a personal income tax rate of 30%, for example, the option of retaining profits is only beneficial if profits are reinvested for 324 years. See Jacobs/Scheffler/Spengel (2015) p. 607.

Table 58: Statutory tax rates on corporate and non-corporate business income in Germany 2000–2014

	Corporation			Non-corporate entity			
	CIT rate	PIT rate (dividends)	Overall	PIT rate (business income)	Trade tax lowers income?	Trade tax imputed?	Overall
2000	30% / 40%	51.0%	61.8%	43.0%	yes	no	55.0%
2001	25.0%	0.5 * 48.5%	54.9%	48.5%	yes	180%	52.0%
2002	25.0%	0.5 * 48.5%	54.9%	48.5%	yes	180%	52.0%
2003	26.5%	0.5 * 48.5%	55.8%	48.5%	yes	180%	52.0%
2004	25.0%	0.5 * 45.0%	53.7%	45.0%	yes	180%	48.9%
2005	25.0%	0.5 * 42.0%	52.8%	42.0%	yes	180%	46.3%
2006	25.0%	0.5 * 45.0%	53.7%	42.0%	yes	180%	46.3%
2007	25.0%	0.5 * 45.0%	53.7%	42.0%	yes	180%	46.3%
2008	15.0%	0.5 * 45.0%	47.2%	45.0%	no	380%	48.4%
2009	15.0%	25.0%	49.1%	45.0%	no	380%	48.4%
2010	15.0%	25.0%	49.1%	45.0%	no	380%	48.4%
2011	15.0%	25.0%	49.1%	45.0%	no	380%	48.4%
2012	15.0%	25.0%	49.1%	45.0%	no	380%	48.4%
2013	15.0%	25.0%	49.1%	45.0%	no	380%	48.4%
2014	15.0%	25.0%	49.1%	45.0%	no	380%	48.4%

Notes: The given statutory tax rates assume a qualified shareholder who is subject to the top personal tax rate. The multiplier for trade tax is fixed at 428%, the German average of 2001. For the corporate case, a distribution of profits as dividends is assumed.

6.5 *Interim Conclusion*

The *Steuersenkungsgesetz* 2001 and the *Unternehmensteuerreformgesetz* 2008/09 improved the investment conditions in Germany noticeably. Disregarding investor-level taxation, the average cost of capital decreased from 7.7% to 6.5% and the EATR from 40.4% to 28.2%. So the return that an investment worth undertaking needs to yield is 1.2 percentage points lower in 2014 than in 1999. Compared to the European mean of 6.0%, however, Germany still features above-average cost of capital. Multinational investors should therefore prefer extending activities elsewhere in the EU while cutting investments in Germany. Moreover, the results imply an inferior competitiveness of German companies that offer similar products and services in the same markets as their foreign counterparts. The incentives for founding or relocating companies are better captured by the EATR than the cost of capital. Considering EATRs, Germany also features one of the highest tax burdens in Europe that exceeds the European average (23.3%) by 4.9 percentage points. Hence, the tax system provides no or only little reason to relocate business activities to Germany or to start them there.

Including investor-level taxes changes the picture significantly. The introduction of the *Halbeinkünfteverfahren* in 2001 reduced the cost of capital and the EATR for qualified shareholders who are subject to high personal income tax rates from 5.9% to 4.4% and from 48.3% to 38.9%, respectively. The 2001 reform generally benefited equity financing more than debt financing. The transition to the *Teileinkünfteverfahren* and the *Abgeltungsteuer* in 2008, however, removed the reliefs at the investor level. The cost of capital returned to the initial level of 5.9%. Unqualified shareholders also suffered an increase of the cost of capital to 5.8%, which exceeds the pre-2001 value by 1.9 percentage points. Moreover, equity financing is massively discriminated against since 2008. With regard to the EATR, smaller increases occurred in 2008 due to the heightened meaning of the corporate income tax rate. Similar to the corporate level, Germany ranks among the countries with the highest effective tax burdens at the investor level. The cost of capital (6.0%) as well as the EATR (39.1%) both exceed EU averages substantially (5.5% and 30.3%, respectively).

For transparently taxed entities, a similar picture emerges. The 2001 reform reduced the tax burden on investments in sole proprietorships and partnerships whereas the 2008 reform had the opposite effect. For sole proprietors and partnerships – or rather their owners – the deterioration in 2008 was even worse than for the shareholders of corporations as they experienced a significant increase in the statutory tax rate. Obviously, this affects the mostly

non-corporate SME sector in particular and further contributes to a comparatively unattractive tax environment for SMEs in Germany.

For cross-border investments, two scenarios need to be distinguished: investments by a German company in a foreign subsidiary (outbound investments) and investments by a foreign parent company in a German subsidiary (inbound investments). During the whole observation period from 1999 to 2014 the cost of capital and the EATR of domestic investments in Germany exceed the values for outbound investments in the other EU Member States. Hence, German companies owning subsidiaries abroad are incentivized to extend investments in these subsidiaries rather than their domestic activities. The disadvantage of domestic investments in Germany has decreased, though, from 1.2 to 0.4 percentage points for the cost of capital and from 17.1 to 5.9 percentage points if the EATR is considered. Only taking self-financing as the tax-efficient way of providing capital to the subsidiary, the gap has decreased from 2.3 to 0.8 percentage points (from 23.4 to 7.4 percentage points for the EATR). The *Steuersenkungsgesetz* as well as the *Unternehmensteuerreformgesetz* contributed to this trend by reducing the corporate income tax rate but they did not completely remove Germany's disadvantage.

For inbound investments, the cost of capital and the EATR also exceed the corresponding values for (domestic) investments in other EU Member States during the whole sample period from 1999 to 2014. Foreign companies should therefore tend to invest in their country of origin rather than in Germany. However, the gap also narrowed for inbound investments. While they featured a cost of capital that was 1.3 percentage points higher than the average of domestic investments in the EU in 1999, the number decreased to 0.6 percentage points in 2013. Correspondingly, the difference for the EATR changed from 13.4 to 7.4 percentage points. In contrast to that, a slight advantage (0.1 percentage point) of inbound investments in 1999 has transformed into a slight disadvantage in 2014 (0.2 percentage points) when considering a subsidiary that is exclusively and tax-efficiently financed with debt.

The financing neutrality of the German tax system was substantially improved by the *Steuersenkungsgesetz* in 2001 as the big advantage of debt financing on the corporate as well as on the investor level was reduced. Businesses with limited access to the capital market therefore experienced an improved investment environment. In addition, the abolition of the split corporate income tax rate equalized the tax burdens of self-financing and new equity. The increased taxation of shareholders after the *Unternehmensteuerreformgesetz* in 2008/09,

however, reinforced the discrimination of equity financing. The corporate level, of course, remains unaffected by shareholder taxation but the deductibility of interest expenses also makes debt the superior source of capital if investor-level taxes are neglected.

The distinction of different asset classes in the above analysis indicates real investments (buildings, intangibles and machinery) to be subject to smaller reliefs than financial assets. Although the incentives for undertaking real investments have increased as well, their relative advantageousness compared to financial assets has deteriorated. The broadening of the tax base in 2001 and 2008 is the driver of this development as it mostly affected real investments (in particular the more restrictive depreciation rules). Further deteriorations of the investment friendliness of the German tax code stem from increasingly restrictive loss-offset rules (minimum taxation, more restrictions on loss carry backs, loss trafficking rules), the interest barrier and the addition of interest payments to the tax base of the trade tax. Other countries have installed similar provisions, though.

Altogether, the analysis of effective tax burdens on the corporate level for domestic as well as for cross-border investments shows an increase of Germany's attractiveness as an investment destination. The positive trend is mainly driven by the substantial reductions of the corporate income tax rate. The comparison with other EU Member States, however, reveals that the level of effective tax rates is still comparatively high. In this regard, no major efforts have been undertaken since 2008. For a further gain in attractiveness, German business taxation requires another cut in tax rates being applied on entrepreneurial profits.

If the taxation of capital gains, dividends and interest income on the level of the shareholders is taken into account, a different picture emerges. The reliefs implemented by the *Steuersenkungsgesetz* in 2001 were almost completely nullified by the 2008/09 reform. Moreover, equity financing was put at a substantial disadvantage compared to debt financing. A removal of this imbalance requires a lower tax rate on dividends or a more extensive exemption of proceeds from equity investments. Alternatively, equity financing could be relieved on the corporate level, e.g., by means of a notional interest deduction.

The general findings, of course, apply to large enterprises as well as to SMEs. Both groups benefit from the reduction of effective tax burdens on the corporate level and the improved competitiveness of the German tax system. Nonetheless, the analysis exposes the structural disadvantages for SMEs emanating from the tax system. First of all, debt financing induces lower effective tax burdens than equity because interest payments are mostly deducti-

ble from taxable income whereas dividends are not. For the majority of SMEs, access to debt finance is not as big a problem as it used to be. Young and innovative SMEs, however, usually have to rely more on equity than established businesses. Hence, the lack of financing neutrality in the tax system hurts exactly those enterprises which are among the most important ones for sustainable, long-term economic growth and which have the most problems in obtaining funds. The reform in 2008/09 even aggravated the problem in Germany and – considering the investment conditions for innovative start-ups – was a step in the wrong direction.

The increased taxation of shareholders is another deterioration of investment conditions which primarily affects SMEs. They usually feature fewer shareholders with higher holding quotas than large corporations. The shareholders of SMEs often need the proceeds from their businesses to make a living and cannot retain profits. Moreover, they are subject to comparatively high personal tax rates. The shareholders of multi-national companies, in contrast, are often exempt from shareholder taxation so that the redistribution of the tax burden from the corporate to the shareholder level is in part a redistribution from large to small enterprises. It is unclear, though, if policy-makers were not aware of this effect or if they accepted the discrimination of SMEs as the price to pay for staying competitive in the international tax competition. The development of the effective tax burden for non-corporate businesses may suggest the latter as it further contributes to the obvious deterioration of investment conditions for SMEs in Germany.

Lastly, SMEs exclusively operating from Germany experience disadvantages due to the lower levels of effective tax rates in most other EU countries. If SMEs do not have the opportunity to relocate their activities, they are in danger to fall behind German competitors incurring lower tax burdens through outbound investments as well as international competitors incurring lower tax burdens through domestic investments in their residence countries or even inbound investments to Germany that are financed adequately. This tax-related disadvantage, of course, can only be removed or attenuated if the level of taxation in Germany will be further reduced in the future.

7. Conclusion

- (1) The SME sector, as defined by the European Commission, comprises micro, small and medium-sized enterprises, ranging from 0 to 250 employees, from € 0 to € 100 million of turnover and from € 0 to € 86 million of total assets. SMEs account for the bulk of economic activity in the European Union and they are essential to Europe's economic development and prosperity. As a consequence, the need for specific SME support, most notably in the form of tax incentives, is a popular credo among European policy-makers.
- (2) Tax incentives for specific groups of taxpayers should be treated with caution, though. Above all, the tax system needs to be as fair, as simple and as neutral as possible. Distortions in the allocation of resources need to be held to a minimum. Naturally, discriminatory treatment of small and large firms is contradictory to these guiding principles and there must be valid reasons when privileging either group. If such reasons are given, the adequacy of tax incentives depends on their ability to properly address and alleviate the targeted problems as well as on the costs associated with their implementation. In order to ensure their efficiency and avoid unintended adverse effects, they must be designed in a simple, transparent and neutral way.
- (3) With regard to currently available regimes, SME tax incentives are common practice in the Member States of the European Union. Most notably, reduced income tax rates are regularly offered to micro and small businesses as well as to their owners. In addition, input-based incentives such as special depreciation schemes, tax allowances and tax credits can be found in numerous tax codes. The latter are frequently limited to rather specific areas of application, e.g., to certain underprivileged regions or to certain kinds of investments. Given these restrictions in the scope of application, the vast majority of regimes in the European Union does not have a significant impact on the tax burdens of most SMEs. Comparing the three classes of SMEs, micro companies receive by far the most generous benefits, whereas small and – even more so – medium-sized entities are rarely subject to substantial tax cuts. Besides reductions in tax payments, the very smallest enterprises also benefit from administrative reliefs throughout the European Union. The simplifications range from less frequent tax payments and returns over simplified accounting requirements up to special regimes building on alternative tax bases (e.g., turnover) or even lump-sum payments.

- (4) Given the multitude of available SME incentives, the question of their justification arises. In general, the market mechanism should be assumed to induce the best available allocation of resources unless frictions prevent the well-functioning of the market. If, however, market failure does indeed occur and results in underinvestment in the SME sector, policy-intervention could be warranted. With regard to small businesses, positive externalities in the form of job creation and innovation as well as asymmetric information between business insiders and outsiders are the most commonly cited market failures. The latter induces an insufficient provision of capital as investors are unwilling to invest when they cannot properly assess the associated risks.
- (5) Existing evidence does generally not confirm that the SME sector as a whole is affected by the aforementioned market failures. Instead, it is only a very small group of young and dynamic firms who feature an above-average propensity to generate jobs and innovation and who are subject to increased problems of obtaining sufficient financing due to their heightened capital needs and the uncertainty associated to their business models. The majority of SMEs, however, are not (or not so much) affected by market frictions. Tax incentives relying on size as the main eligibility criterion are thus not targeted adequately. In addition, most of the currently available regimes tend to provide exactly those businesses with the most generous reliefs that are the least affected by market failure, i.e., the well-established and highly profitable enterprises. Start-ups and upcoming high-growth, high-risk firms, by contrast, can often not take full advantage as they regularly do not have the positive income required to benefit from preferential tax rates and input-based, non-refundable tax credits and allowances.
- (6) Disadvantages of smaller entities emanating from the tax system constitute another line of argumentation in favor of providing SME tax incentives. Most prominently, SMEs are assumed to be discriminated against because their compliance burden is disproportionately high. Given that compliance costs are largely made up of fixed and quasi-fixed costs, whose impact decreases in firm size, there is indeed a case to be made for SME incentives. Firm size actually is the characteristic causing the problem and it should thus be the characteristic to be referred to when targeting compensatory relief. Naturally, the relief itself should relate to the underlying friction, which im-

plies the provision of administrative reliefs rather than other instruments aiming at the actual tax liability (e.g., special tax rates).

- (7) In addition, SMEs are assumed to be disadvantaged by the tax system because they do not have the tax planning opportunities of large entities, because they are more affected by the double taxation of corporate profits and restricted loss offsets and because they are more reliant on equity financing that is traditionally disadvantaged in modern income tax systems. These alleged tax-related discriminations, however, do not justify the use of SME incentives. Evidently, owners of small businesses evade more taxes than any other group of taxpayers by mingling private and business affairs. Moreover, they have substantial leeway to organize operations in tax-minimizing ways as well, e.g., by choosing their legal form adequately, by timing profit distributions according to their preferences or by setting up contract relations with their businesses. Moreover, the double taxation of corporate profits, the discrimination of equity and the restriction of loss offsets do not necessarily affect small businesses more than large entities; and even if they did, the obvious approach would be to address the issues directly instead of trying to alleviate one distortion by introducing a new one.
- (8) Besides displaying a lack of effectiveness in addressing the problems associated to the SME sector, SME tax incentives also come along with significant welfare costs. First of all, they introduce additional complexity to the tax code. The compliance costs of taxpayers as well as the collection costs of tax administrations are thereby increased, which is especially critical in the SME sector where the compliance burden plays a crucial role. Further costs arise due to deficient designs of tax incentives that lead to unnecessary violations of the neutrality of the incentive itself as well as of the tax code as a whole.
- (9) Eligibility criteria explicitly referring to firm size constitute a particularly critical design feature of many SME tax incentives. If only entities up to a certain income, turnover or asset threshold are granted relief, taxpayers are incentivized to either underreport their business size, to defer growth or to permanently remain small. Accordingly, the bunching analysis of prominent size thresholds in the tax codes of six Member States of the European Union displays significant taxpayer bunching at turnover and employment thresholds, in particular when the eligibility for complete

exemptions and simplified regimes is at risk. The latter tend to combine administrative facilitations with overly generous tax cuts, thereby creating considerable distortions in the competition between eligible and ineligible businesses. Moreover, firm growth and job creation is severely impeded by explicit size criteria, especially when the number of employees is referred to. Obviously, a slowdown of firm growth is the exact opposite of the intended effect of tax incentives.

- (10) The distortion of the legal form choice is another problem arising from discriminatory SME tax incentives. If certain benefits are exclusively provided to either corporate or non-corporate entities, businesses are inclined to choose the legal form that grants eligibility. Simplified tax accounting, for example, is generally only provided for non-corporate entities. As is shown empirically, this induces a statistically significant amount of firms to choose the non-corporate form of business. Specifically, about one in a hundred entrepreneurs is found to refrain from incorporation if he can thereby avoid complex, accruals-based accounting regulations. Not only does this show the significance of compliance costs for the very smallest enterprises, but it also hints at possible welfare losses if the choice of legal form impacts on entrepreneurs' risk aversion and their ability to acquire capital.
- (11) Altogether, the use of SME tax incentives is mostly inappropriate. Considering currently available regimes, the majority of incentives are ineffective in addressing the problems of the SME sector. The provisions are regularly not well designed and cause unnecessary complexity in the tax code as well as additional distortions to investment, financing and legal form decisions. Essentially, they do not fulfill a single one of the four postulated quality criteria for adequate tax incentives: effectiveness, simplicity, neutrality and efficiency. Some exceptions need to be made, though. Above all, administrative reliefs are an appropriate instrument to alleviate the disproportionate compliance burden of small businesses and to save collection costs on the side of the tax administration as well. In addition, R&D tax incentives and the taxation of venture capital investments are areas where enhanced benefits for SMEs can make sense as the overriding problem of accurately targeting the small group of dynamic and innovative SMEs is less prevalent in these sectors. It needs to be highlighted, though, that even then explicit size criteria should be avoided. Instead, abso-

lute caps on available reliefs represent the superior approach of targeting SMEs. Such caps are easier to implement and cause fewer distortions.

- (12) Given the inappropriateness of most SME tax incentives, the focus of tax policies supporting SMEs should shift to the provision of a generally neutral and simple tax system that benefits investments in large as well as small and medium-sized entities. In Germany, the two most recent reforms of the corporate and the personal income tax in 2001 and 2008/09 indeed had the explicit goal of creating an investment-friendly and internationally competitive tax environment. This endeavor, however, was only partly accomplished. Germany still features one of the highest effective tax burdens for corporations in Europe. And while effective tax rates were broadly and substantially reduced by the 2001 reform, the changes in 2008 and 2009 had – to a large part – adverse effects, especially for SMEs. Most importantly, the tax burden on the corporate level was reduced at the expense of the shareholder level. Given the relative importance of shareholder taxation for small and large companies, this development predominantly hurts the SME sector. The discrimination of equity financing and overly restrictive loss offset and loss trafficking rules are further elements that are especially detrimental to the attractiveness of the German tax system for young, dynamic and innovative enterprises. The removal of these obstacles to growth – and not the provision of specific and mostly ineffective SME tax incentives – should be the focal point of legislators in Germany as well as in other countries.

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Appendix

Annex 1: Country Reports

In the following, available SME tax incentives and special regimes in the 28 countries of the European Union and selected other countries are described. Moreover, the country reports inform about other – generally applicable – provisions that might benefit or discriminate against SMEs. The focus of the summaries is on corporate income taxation. Transparently taxed enterprises, however, are subject to the majority of incentives, too (except for special CIT rates).⁵¹¹

The summaries also include special SME tax incentives for sole proprietors, partnerships and the shareholders of SMEs. Moreover, provisions targeted at newly founded enterprises are accounted for because most of them are either micro, small or medium-sized enterprises when starting their operations. Lastly, size-related reliefs in value-added taxation are considered. Although the final consumer is the subject of the value-added tax, reliefs do effectively benefit enterprises – in terms of compliance costs as well as actual tax payments. The terms micro, small and medium-sized enterprises are used in accordance with the standards given by the European Commission⁵¹² if not stated otherwise.

Austria

On the firm level, Austria does not offer special tax incentives for SMEs. There is only an adjusted minimum tax for newly founded companies of € 1,092 that only benefits low-income companies. On the shareholder level, Austria grants full exemption to income from participations in unlisted European SMEs (i.e., dividends, capital gains and interest payments) for so-called intermediary investors. Intermediary investors must be corporate entities financed with equity capital. For individual investors, dividends from such intermediary investors are exempt from income taxation up to € 25,000.

⁵¹¹ If eligibility thresholds are reported in local currencies other than €, comparable euro amounts are given in brackets. Exchange rates as of December 31, 2015 were referred to for the conversion.

⁵¹² The European Commission defines micro, small and medium-sized enterprises as businesses not exceeding certain thresholds for the number of employees (20/50/250), turnover (€ 2 million/€ 10 million/€ 50 million) and total assets (€ 2 million/€ 10 million/€ 43 million). See Section 2.1 and European Commission (2003) p. 39.

Enterprises are exempt from the value-added tax (VAT) if their turnover is lower than € 35,000. Moreover, enterprises with less than € 100,000 of turnover in the preceding year only have to file VAT returns and make VAT payments on a quarterly basis (instead of monthly). Suppliers with a turnover of less than € 110,000 may pay VAT on a cash basis.

Belgium

Belgium has numerous incentives for SMEs in place. For tax purposes, an enterprise must meet the following criteria to be considered an SME:

- not more than 50 employees (and not more than 100 employees even if the other criteria are fulfilled);
- turnover does not exceed € 7 million;
- balance sheet total does not exceed € 5 million
- profits do not exceed € 322,500.

Belgium offers several investment allowances. The general investment deduction for SMEs amounts to 10.5% of the depreciation taken on assets. The rate has varied between 10.5% and 12.5% since 2009.⁵¹³ The incentive is restricted to companies with fewer than 20 employees. Unused amounts can be used in subsequent years with a maximum carry-forward of € 946,800 (or 25% if the unused part exceeds € 3,787,210). Additionally, an allowance of 20.5% is granted to SMEs for investments in safety measures either in the year of the investment or the following year. Concerning carry-forwards the same rules apply as for the above deductions. A notional interest deduction is available for all Belgian companies. It amounts to 4% of qualifying equity.⁵¹⁴ SMEs, however, are allowed to deduct an additional 0.5%. Since 2012, carry-forwards are no longer possible.

With regard to depreciation, SMEs may – irrespective of the exact date of acquisition – deduct 100% of the ordinary annual depreciation for an asset in the year of acquisition.⁵¹⁵ Moreover, all costs related to the acquisition of depreciable assets can be immediately depreciated. Newly founded companies can also immediately depreciate all costs of establishment.

⁵¹³ The exact rates in this period are as follows: 10.5% from 2009 to 2011, 12.5% in 2012 and 11.5% in 2011.

⁵¹⁴ The exact rates for large companies from 2009 to 2013 are as follows: 4.307% in 2009, 4.473% in 2010, 3.8% in 2011, 3.425% in 2012 and 3% in 2013. The respective rates for SME are 0.5% higher.

⁵¹⁵ Until 2010, the regime was more generous. SMEs could incur depreciations on all assets that were twice as high as the normal rate in the first three years of usage.

SMEs may shift income into a tax-exempt reserve of at most € 37,500 or 50% of retained earnings. The maximum size of the reserve can be further reduced by the following circumstances:

- occurrence of capital gains on shares that are eligible for participation exemption;
- occurrence of exempt capital gains on cars used for business purposes;
- occurrence of gains on debt claims against managers, shareholders and their spouses or children;
- paid-up capital is decreased.

The income entering the reserve needs to be re-invested within three years. The reserve must not be used in combination with the notional interest deduction on equity.

SMEs in Belgium also benefit from progressive corporate income tax rates (rates are given excluding the surcharge of 3%):

- 24.25% on income \leq € 25,000;
- 31% on income between € 25,000 and € 90,000;
- 34.5% on income between € 90,000 and € 322,500;
- 33% on all income beyond that.

Certain types of companies are not allowed to apply the reduced rates (financial companies, collective investment companies, companies owned by other companies by 50% or more, companies whose distributions exceed 13% of paid-in capital, members of groups with a coordination center and companies not paying at least € 36,000 to a director or active partner). The size of the tax credit on R&D investments – if utilized – is adjusted to the progressive schedule.

Further reliefs for SMEs include exemptions from the special tax on capital gains (0.412%) and the so-called “Fairness Tax”. The latter is levied at 5.15% (including austerity surcharge) upon distributions that are made in spite of losses or in the absence of taxable income due to other tax incentives. Moreover, 80% of SMEs’ income derived from self-developed patents are tax exempt. Large firms only benefit from this exemption if the underlying patents were acquired. With regard to administrative regulations, SMEs do only have to make yearly tax payments (instead of quarterly).

On the shareholder level, dividend distributions from SMEs with respect to shares issued after July 1st 2013, are subject to reduced withholding taxes if they are made at least three years after issuance (20% in the third year and 15% in the fourth and subsequent years instead of 25%). For this purpose, the following conditions need to be met:

- The shares must be held continuously and in full ownership by the same shareholder for three or four years.
- The shares must be issued in exchange for cash contributions.
- The statutory minimum amount of capital must be paid up.

Capital gains of SMEs from their subsidiaries are completely exempt from capital gains taxation if the subsidiaries meet certain qualitative criteria.

Lastly, there is an advance payment system in place for the taxation of liquidation proceeds from SMEs. Eligible SMEs may create a "liquidation reserve" from after-tax profits which must be maintained on a separate equity owner's account. The liquidation reserve immediately is subject to a separate non-deductible tax of 10%. In return, no dividend withholding tax is due upon liquidation. If the liquidation reserve is distributed as a dividend within 5 years, though, a dividend withholding tax of 15% is due (5% if distributed after more than 5 years).

Newly founded enterprises may immediately depreciate all costs of establishment and costs related to the creation of the enterprise.

With regard to the VAT, SMEs are exempt if their turnover does not exceed € 15,000.

Bulgaria

Bulgaria does not have special tax incentives for SMEs. Small companies are subject to administrative reliefs, though. Enterprises whose net sales in the previous year were below BGR 300,000 (\approx € 150,000) do not have to make advance tax payments and those with net sales below BGR 3,000,000 (\approx € 1,500,000) only have to make quarterly advance payments (instead of monthly). In addition to that, simplified accounting standards apply for SMEs.

VAT registration is only required for enterprises with more than € 25,565 of turnover.

Croatia

Croatia provides comprehensive investment incentives for new undertakings. Income from new investments (also by existing enterprises) can be subject to corporate income tax rates that are reduced by up to 100% for 10 years. The exact amount of the reduction depends on the size of the investment and on the number of newly created jobs related to the investment:

- 100% reduction if investment of at least € 3 million and related to 15 new employees;
- 75% reduction if investment of at least € 1 million and related to 10 new employees;
- 50% reduction if investment of less than € 1 million and related to 5 new employees.

For micro companies with up to 10 employees, a special regime exists that grants a 50% relief (resulting in a tax rate of 10% compared to the normal 20%) if the investment amounts to at least € 50,000 and creates 3 new jobs. Before the Law on Investment Promotion (2012), Croatia offered a similar incentive schedule without a special schedule for micro companies and with higher thresholds for eligibility:

- 100% reduction if investment of at least € 8 million and related to 75 new employees (50 for R&D activities);
- 80% reduction if investment of at least € 4 million and related to 50 new employees (25 for R&D activities);
- 65% reduction if investment of at least € 1.5 million and related to 30 new employees (15 for R&D activities);
- 50% reduction if investment of € 300,000 (€ 100,000 for R&D activities) to € 1 million and related to 10 (5) new employees.

In addition, extensive reliefs were available for companies in economically weak regions. These regional incentives have been abolished. Croatia also provides a special allowance for eligible costs for general education and training (60%) and special education and training (25%) for employees. The percentages increase for medium-sized to 70% and 35%, for small and micro enterprises to 80% and 45%, respectively.

VAT registration is only required if the turnover exceeds HRK 230,000 (\approx € 30,000). Quarterly VAT payments (instead of monthly) can be made if the turnover is below HRK 800,000 (\approx € 100,000).

Cyprus

There are no tax incentives for small and medium-sized enterprises in Cyprus.

Czech Republic

The Czech Republic provides comprehensive investment incentives for new undertakings. Income from new investments (also by existing enterprises) can be subject to full exemption from the corporate income tax for 10 years. The exemption applies if the following conditions are met:

- investment of at least CZK 100 million (\approx € 3,7 million) in the manufacturing sector;
- investment of at least CZK 10 million (\approx € 370,000) and creation of at least 40 new jobs in so-called technological centers;
- creation of at least 40 new jobs in strategic service centers.

Businesses are exempt from the VAT if their turnover is below CZK 1 million (\approx € 37,000).

Denmark

There are no tax incentives specifically targeted at SMEs in Denmark. With regard to administrative obligations, there is a relief from transfer pricing documentation for small companies with not more than 250 employees, a maximum turnover of DKK 250 million (\approx € 33 million) and a maximum balance sheet total of DKK 125 million (\approx € 17 million). The relief only applies if no transactions with other entities outside the EEA are made. For VAT purposes, no registration is required if turnover is below DKK 50,000 (\approx € 7,000). Half-yearly payments (instead of monthly) are allowed if taxable revenues are below DKK 5 million (\approx € 670,000). Quarterly payments suffice if revenues do not exceed DKK 50 million (\approx € 7,000).

Estonia

Estonia provides no special tax incentives for corporate SMEs. This is due to the Estonian tax system that does not tax corporate income as such but only corporate distributions. Consequently, there are no reliefs of corporate income at all.

Registration for VAT is only required if turnover exceeds € 16,000.

Finland

Finland does not provide tax incentives specifically targeted at SMEs. There is a regime of accelerated depreciation for fixed assets being used in production activities (200% of the usual depreciation rate on machinery, equipment and industrial buildings). The regime used to be restricted to SMEs until 2013 but is now available for all enterprises. Moreover, the super deduction of 100% of salary costs incurred for R&D projects is capped at € 400,000. SME should therefore benefit more than large enterprises.

Businesses with less than € 8,500 of turnover are exempt from VAT. If turnover is below € 25,000, only yearly VAT payments need to be made, if it is below € 50,000, only quarterly payments are required (instead of monthly). Moreover, SMEs are subject to reduced documentation requirements with regard to transfer prices.

France

France offers a multitude of tax incentives specifically designed for SMEs. The provisions include tax credits, special tax rates and various exemptions from income tax. Enterprises are generally considered SMEs if they comply with the SME criteria by the European Commission.

A special tax rate of 15% is available for SMEs with less than € 7,630,000 of turnover. The SME must be held directly or indirectly by individuals or other SMEs fulfilling the aforementioned condition. The special corporate income tax rate applies to income up to € 38,120 (instead of the usual rate of 33.33%). The surcharge of 3.33% is dispensed for all SMEs meeting the turnover criterion, whereas all other enterprises incur the surcharge on income tax payments beyond the threshold of € 763,000. Since 2012, another surcharge of 10.7% (5% until

2012) is in place for all companies with an income of more than € 250 million, which, by definition, does not apply to SMEs.

Furthermore, micro enterprises may use simplified rules to determine taxable income if two of the following three criteria are met:

- turnover \leq € 534,000;
- balance sheet total \leq € 267,000;
- number of employees \leq 10.

Micro enterprises with less than € 82,200 (sale of goods) or € 32,900 (services) of income, respectively, may even opt for lump-sum expense deductions from turnover to determine their taxable income (71% for sales activities; 50% for service activities; 34% for professional services).

France also offers several tax credits for SMEs. A credit of 20% is granted on expenditures related to innovative activities up to € 400,000. Another credit is available for SMEs with at least 20 employees. The credit equals the difference of the income tax payable multiplied with a rate reflecting the size of the increase in employment and the corporate income tax paid effectively in the preceding year (\rightarrow income tax payable * employment rate – income tax payable_{t-1}). The employment rate ranges from 0 to 100% with 100% reflecting an increase of 15% or more in personnel expenses compared to the preceding year. The credit only applies if the number of employees compared to each of the previous two years increased by at least 15%. Until 2014, another one-off corporate tax credit was granted to SMEs for expenses related to the hiring of an employee to develop export activities outside the EU. The credit amounted to 50% of qualifying expenses and was limited to € 40,000 over a two-year period. Lastly, there is a special tax credit for SMEs on the island of Corsica. The credit amounts to 20% and is granted on the following investments:

- depreciable assets that qualify for declining-balance method depreciation;
- the installation or arrangement of commercial premises;
- software necessary for the use of the aforementioned assets or premises;
- renovation of hotels.

In order to be applicable, enterprises' turnover must not exceed € 40 million, the number of employees must not exceed 250 and at least 75% of the shares need to be held by individuals

or other SMEs. Unused credits can be carried forward for 9 years. A partial refund is available after 5 years (35%; 50% after 9 years). New firms are granted an immediate refund.

A full exemption from the business tax (CAVE) applies to SMEs if their turnover is below € 152,500. Due to allowances, businesses with a turnover below € 500,000 are effectively exempt as well. Moreover, the allowance creates a progressive tax rate structure for the business tax:

- turnover between € 0 and € 500,000: 0%;
- turnover between € 500,000 and € 3 million: 0% to 0.5%;
- turnover between € 3 million and € 10 million: 0.5% to 1.4%;
- turnover between € 10 million and € 50 million: 1.4% to 1.5%.

In addition, newly founded innovative SMEs are subject to an exemption from corporate income tax in the first two years of operations (100% in the first year, 50% of income derived in the second year of their innovative activities). Eligible SMEs must not be older than eight years and pursue R&D activities that account for at least 15% of the total expenses incurred. The incentive also includes exemption from the local business tax and social security contributions. Until 2011 SMEs were even granted five years of relief (three years with an exemption of 100% and two years with 50%). Newly created companies may also benefit from tax exemptions in certain regions (“redevelopment areas”) for the first five years of operations. The exemption decreases gradually from 100% to 75%/50%/25% in the last three years of the five-year period. The maximum relief that can be obtained from this incentive amounts to € 200,000. The same limit applies to the exemption of income from SMEs that were created to take over companies in hardship. The regime is only available in certain regions and only in the first two years of operation of these newly founded SMEs. Another five-year exemption (100%) is offered to newly created companies in tax-free urban zones. Enterprises need to have at least one employee in order to be eligible. The maximum exemption equals € 100,000 per year and further tax incentives can be used under this regime.

Another exemption from income taxes exists for SMEs with regard to capital gains from the sale of a complete branch of activity excluding gains on immovable property. The exemption amounts to 100% if the value of the branch does not exceed € 300,000 and to 50% if it is between € 300,000 and € 500,000. At least 75% of the disposing SME must be held directly or indirectly by individuals or other SMEs.

Further preferential treatments for SMEs include the following:

- SMEs are eligible for an immediate refund of the R&D tax credit that is generally applicable for enterprises of all size classes. The R&D tax credit at 30% is also capped as only expenses up to € 100 million are eligible. Beyond the threshold the credit is reduced to 5%, which can only affect large enterprises.
- SMEs are subject to beneficial provisions concerning the immediate recognition of losses from foreign branches. The offsetting enterprise must not have more than 2,000 employees, be subject to corporate income tax and be owned (75%) by individuals or other enterprises fulfilling the above two conditions. Moreover, the source state must impose income taxes that are comparable to the French taxes and have an administrative assistance clause in the tax treaty with France. The maximum cash benefit from this regime must not exceed € 500,000.

Shareholders of SMEs benefit from various other reliefs:

- Retiring SME owners are eligible for an allowance of € 500,000 on the sale of their shares in the SME. Capital gains of directors of SMEs who sell their shares upon retirement are also exempt if certain requirements concerning the holding period are met.
- Capital gains from the disposal of shares in SMEs are (partly) exempt: 50% if the holding period has been between 1 and 4 years, 65% if from 4 to 8 years and 85% for holdings over 8 years. This relief only applies if the SME had not existed for more than 10 years at the time of acquisition, is subject to CIT and situated in an EEA country. Retiring owners of SMEs do not have to fulfill these conditions.
- 18% of amounts invested in qualifying SMEs can be deducted from the personal income tax base up to an amount of € 50,000 (for small companies) or € 20,000 (for medium-sized companies).
- 50% of investments in qualifying SMEs are deductible for wealth tax purposes up to an amount of € 45,000.
- Capital contributions to innovative SMEs can be depreciated over 5 years under certain conditions.
- Venture capital firms benefit from an exemption of their income from securities and shareholdings. Certain criteria with regard to the legal form and the assets of venture capital firms apply.

For purposes of the VAT, enterprises are exempt if their turnover does not exceed € 80,000 (supply of goods/accommodation/food) or € 32,000 (supply of other services). A simplified regime with quarterly provisional payments and a year-end final settlement is available for enterprises with less than € 763,000 (supply of goods/accommodation/food) or € 230,000 (supply of other services) of turnover.

Germany

Germany has two tax incentives in place that target specifically small companies. For both reliefs, the following criteria must be met in order to be eligible:

- Net assets must be smaller than € 235,000 if the company applies the net worth method to determine the taxable income and smaller than € 100,000 if the company applies the net income method. (The thresholds were reduced from € 335,000 and € 200,000 respectively in 2011.)
- The relevant assets must remain in a domestic permanent establishment of the company for at least one year.

The benefits connected to fulfilling these criteria are twofold: First, an additional depreciation of 20% of the acquisition or manufacturing costs of new movable assets can be incurred in the year of acquisition or manufacturing and the following four years (20% at most in all five years together). The additional depreciation reduces subsequent depreciations accordingly. Second, an investment reserve of up to 40% of future acquisition or production costs of depreciable assets can be recognized. Income entering the reserve is tax-free upon recognition but is taxed as the respective assets start to be depreciated. The investment reserve is limited to € 200,000. The acquisition or the manufacturing of the asset for which the deduction is claimed must be made within three years and it must be used in a domestic permanent establishment (almost) exclusively for business purposes.

For non-corporate entities, business income up to € 24,500 is exempt from the trade tax.

If the annual turnover does not exceed € 500,000 and the profit stays below € 50,000, simplified tax accounting in the form of modified cash accounting may also be used by non-corporate entities.

If turnover did not exceed € 17,500 in the previous fiscal year and does not exceed € 50,000 in the current year, enterprises are exempt from the VAT. If the annual value-added tax payable does not exceed € 7,500, quarterly payments can be made (instead of monthly).

Greece

Greece does not provide any tax incentives specifically designed for SMEs. There is, however, a scheme that allows establishing tax-free reserves. The reserve amounts to 15–45% of the amount invested in qualifying undertakings (which includes investments that contribute to improving business, technological development, business competitiveness and regional cohesion). The eligible amount depends on the location of the investment and the size of the company (smaller enterprises receive higher reliefs of 25–45% instead of 15–40%). SMEs should therefore receive larger exemptions. The tax-free income must neither be distributed nor capitalized. Up to one third of the exemption is due in the first year of operations of the investment and up to two thirds in the following year. The balance is settled within a maximum of eight years.

For small firms with a turnover of up to € 1.5 million the use of single-entry accounts is allowed; however, this entails an increased tax rate of 33% instead of the usual 26% on all income over € 50,000 for partnerships. Corporate entities are usually not eligible for this special scheme.

A disadvantage for SMEs occurs with respect to Greece's treatment of so-called strategic investments. These are investments of at least € 15 million or investments creating at least 150 new jobs. SMEs naturally will not (or only hardly) reach such investment levels.

Enterprises only need to register for VAT if their turnover exceeds € 5,000 (provision of services) or € 10,000 (sale of goods), respectively. If enterprises use single-entry books, they may also opt for quarterly VAT returns (instead of monthly).

Hungary

Hungary offers substantial tax incentives that primarily benefit SMEs. SMEs are generally defined according to the definition by the European Commission.

Most importantly, a special tax rate of 10% applies to the first HUF 500 million (\approx € 1.6 million). Beyond the threshold, income is taxed at 19%. Moreover, small businesses are exempt from the innovation tax (0.3% of the tax base of the local business tax) and may be exempt from the local business tax (depending on municipalities).

With regard to input-based tax incentives, there are several tax allowances for SMEs. First, 100% of investment expenses for certain assets can be deducted from the tax base if the SME is solely owned by individuals. The maximum deduction is HUF 30 million (\approx € 100,000). SMEs with less than 20 employees can also benefit from an additional allowance of 200% of wage costs that are incurred for employees who are at least 50% disabled. The deductible wage costs per employee cannot exceed the statutory minimum wage. Lastly, micro enterprises with less than five employees and without an outstanding tax liability at the end of the year are subject to an allowance based on the increase in personnel. They are entitled to a deduction equal to the product of the increase in the average annual number of employees compared to the previous year and 12 times the statutory minimum wage.

There is also a tax credit for new investment projects that is available for businesses of all size classes but requires lower minimum investments to be eligible for SMEs:

- Large enterprises: minimum investment is HUF 3 billion (\approx € 10 million), 150 new jobs must be created and wage costs need to be increased by at least 600 times the statutory minimum wage.
- Medium-sized enterprises: minimum investment is HUF 500 million (\approx € 1.6 million), 50 new jobs must be created and wage costs need to be increased by at least 100 times the statutory minimum wage.
- Small enterprises: minimum investment is HUF 500 million (\approx € 1.6 million), 20 new jobs must be created and wage costs need to be increased by at least 50 times the statutory minimum wage.

The tax credit equals 100% of the investment value but must not exceed 80% of the tax liabilities. It is granted in 10 equal instalments.

Another tax credit is offered for SMEs that invest at least HUF 500 million (\approx € 1.6 million) and take out a loan from a financial institution to acquire or produce required tangible assets. The credit equals 60% of the interest paid on the loan with a maximum eligible interest of

HUF 6 million (\approx € 20,000). Enterprises from the transport or the agricultural sectors are not eligible.

For SMEs in disadvantaged regions, immediate depreciation of acquisition costs of machinery, equipment and vehicles (excluding cars) is also available.

In addition to these incentives, small businesses in Hungary may also opt for three alternative regimes. The so-called simplified entrepreneurial tax is available for small businesses that are no public companies and whose turnover does not exceed HUF 30 million (\approx € 100,000). Under this regime, taxpayers are taxed at 37% on turnover increased by VAT. If turnover unexpectedly exceeds HUF 30 million during the fiscal year, an increased tax rate of 50% applies for the excess. The simplified entrepreneurial tax replaces corporate and personal income taxes, the value-added tax and the company car tax. The regime must not be applied if the taxpayer sells waste products falling under the reverse charge regime for VAT purposes or if certain holding requirements are not met.

Another regime that may be opted for instead of the ordinary corporate income tax is the small company tax. In order to be eligible companies need to fulfill the following criteria:

- average number of employees ≤ 25 ;
- expected annual turnover \leq HUF 500 million (\approx € 1.6 million);
- expected balance sheet total \leq HUF 500 million (\approx € 1.6 million);
- balance of enforceable tax debt \leq HUF 1 million (\approx € 3,000)

The small company tax replaces the corporate income tax, the social security tax and training contributions for the taxpayer. The tax is levied at 16% on accrual profits but it must not be smaller than the personnel costs incurred.

Lastly, the itemized tax of small businesses can be chosen by businesses with a turnover of less than HUF 6 million. Under this regime, businesses pay HUF 50,000 (\approx € 160) per full-time employee and HUF 25,000 (\approx € 80) for each employee not being classified as full-time. These tax payments replace the corporate income tax, the social security tax, the health care charge and the vocational training contribution. If the threshold of HUF 6 million (\approx € 20,000) is exceeded, a tax of 40% on the excess turnover is charged.

With regard to administrative obligations, small enterprises are subject to less restrictive regulations on transfer pricing and related documentation. Businesses with a turnover of less than

HUF 6 million are exempt from the VAT. If the net VAT payable is below HUF 1 million (\approx € 33 million), only quarterly returns need to be filed instead of monthly. If net turnover does not exceed HUF 250,000, (\approx € 800) only annual returns are required. Cash accounting for VAT purposes is allowed up to HUF 125 million (\approx € 400,000).

Ireland

With regard to the corporate income tax, Ireland does not provide tax incentives specifically for SMEs. However, they may benefit from an exemption of taxable income up to € 40,000 that phases out between € 40,000 and € 60,000. The exemption is restricted to newly founded companies in the first three years of operation, though, and must not exceed the PRSI contributions made (max. € 5,000 per employee).

SMEs also benefit from less restrictive transfer pricing regulations and – if their tax liability does not exceed € 200,000 – less restrictive provisions for preliminary tax payments. No pre-payments are required from new businesses that do not expect a tax liability of more than € 200,000 in their first year of operations.

For personal income tax purposes, individuals can deduct up to € 150,000 of the acquisition costs of shares in qualifying unquoted trading SMEs from their taxable income (excess investments can be carried forward). The share in the company must not be higher than 30% unless the capital of the company does not exceed € 500,000. Holding restrictions and other anti-avoidance rules are in place. The company must either be incorporated and resident in Ireland or be incorporated in an EEA country and resident (a) in Ireland or (b) in another EEA country and carry on business through a branch or agency in Ireland. In addition, the company must carry on qualifying trade. The maximum capital the company may raise amounts to € 15 million and € 5 million within any 12-month period. An even more generous deduction is granted to formerly employed people who invest in a start-up. They can claim a tax refund on income from the last six years (the maximum tax refund is € 100,000).

For VAT purposes, businesses are exempt if their turnover does not exceed € 37,500. Moreover, small businesses do only have to file returns and make VAT payments every 6 months (instead of every 2 months) if their VAT payments do not exceed € 3,000 and only every 4 months if payments are below € 14,400.

Italy

Italy does not provide generally applicable incentives for SMEs with regard to the corporate income tax. SMEs, however, can use simplified rules for determining the tax base of the business tax (IRAP). The simplified rules include standardized lump-sum deductions for expenses incurred.

Moreover, there is a tax credit for R&D expenses in place that is likely to benefit SMEs more than large companies as it is capped at € 5 million. Eligible enterprises need to incur at least € 30,000. In 2014, two different R&D tax credits were in place. The first one only applied to enterprises with less than € 500 million of turnover. It granted a relief equal to 50% of R&D expenses as far as the expenses surpassed the average of the previous three years. The other credit amounted to 35% of the wage costs that were attributable to newly hired employees in R&D who were given permanent contracts. The cap for this credit was € 200,000.

Companies in the fields of energy production and supply were not subject to the increased corporate tax rate of 34% (instead of 27.5%) if they had a turnover below € 3 million and taxable income below € 300,000. The surtax for companies in the areas of energy production and supply (6.5%) has been abolished in 2015, though.

Innovative start-up companies are exempt from stamp duties and registration fees, if the following criteria are fulfilled:

- business not older than 48 months;
- not a result of a merger/acquisition;
- turnover \leq € 5 million;
- no profit distributions;
- sole purpose of innovative high-technology products and services.

Additionally, at least one out of the following conditions are met:

- R&D expenses amount to at least 15% of revenues or costs;
- one third of all employees are highly qualified;
- the respective company is holder or licensee of patent right connected to its activity.

Newly founded companies – in contrast to established ones – may also fully deduct expenses incurred for studies, research, advertising and entertainment as well as the costs of formation in the first year, in which they incur gross receipts.

Shareholders of innovative SMEs and start-ups can deduct 20% of their respective investments from taxable income. The maximum deduction amounts to € 1.8 million. Furthermore, the shareholding has to satisfy, i.a., the following criteria:

- equity share not larger than € 2.5 million;
- shares must be held for at least 2 consecutive years;
- SME must not be older than 7 years, not have gross production of more than € 5 million and it must be active in the field of highly technological and innovative products.

Investors of venture capital funds are also exempt with regard to their proceeds from the fund if the fund only invests in non-listed, Italian small companies (turnover \leq € 50 million) that are not exempt from corporate income tax, have not been incorporated for more than 36 months and are controlled by individual shareholders.

For purposes of the value-added tax, enterprises that do not have more than € 50,000 of turnover can file quarterly returns (instead of monthly). There is no registration threshold. Each business needs to register for the value-added tax.

Latvia

Latvia provides micro enterprises with the option to tax turnover instead of the ordinary corporate income tax. Companies are eligible if their turnover does not exceed € 100,000 and if they do not employ more than 5 employees who must not earn more than € 720 per month. Shareholders have to be exclusively individuals. Under the regime the following tax rates apply:

- 9% on turnover from € 0 to € 7,000;
- 12% on turnover from € 7,001 to € 100,000;
- 20% on turnover beyond € 100,000.

In the three first years the regime is applied, the lowest rate of 9% is granted for all revenues up to € 100,000. The turnover tax replaces the corporate income tax (15%) and the social security contributions that need to be paid by the employer. Penalty taxes apply if either the wage threshold is exceeded (20% on excess wages) or more than five employees are hired (2% tax rate increase per employee).

In Latvia's special economic zones, a tax credit is available for new investments. For small and micro companies, the credit equals 55% of the investment value, whereas it is limited to 45% for medium-sized enterprises and to 35% for large ones. For each size class, the credit must not exceed 80% of the tax liability. The definition of the size classes corresponds to the definition by the European Commission. With regard to the standard tax credit, however, SMEs are by trend disadvantaged because only investments of at least € 10 million are eligible. The credit grants a relief of 25% of the investment value up to € 50 million and 15% on expenditure beyond the threshold.

For VAT purposes, enterprises are exempt if their turnover does not exceed € 50,000. Businesses beyond the threshold have to file monthly returns. If supplies are below € 14,228.72, six-monthly returns are sufficient. Cash accounting for the value-added tax is allowed up to € 100,000. For the corporate income tax, annual tax returns need to be filed sooner by SMEs (4 months after the end of the fiscal year) than by large enterprises (7 months).

Lithuania

Lithuania has extensive tax incentives for micro companies. Foremost, enterprises enjoy a reduced corporate income tax rate of 5% (instead of 15%) if they meet the following criteria:

- number of employees ≤ 10 ;
- taxable income \leq LTL 1 million (\approx € 300,000);
- corporation must not be owned by more than 50% by an owner/a family/a group of persons who also own(s) a sole proprietorship or other companies by more than 50%.

Companies meeting these criteria whose income does not exceed € 150,000 are also entitled to free depreciation of fixed assets (excluding buildings). When benefitting from the reduced

tax rate, no maximum for the use of loss carry-forwards applies (70% of the current year's income for large entities).

Additionally, newly founded businesses and companies with taxable income of less than € 30,000 in the last three years of operation are allowed to determine their income based on cash accounting. Large enterprises, on the other hand, tend to be favored in special economic zones, where several tax advantages only apply to investments of at least € 1 million.

With regard to the value-added tax, enterprises are exempt if their turnover does not exceed € 45,000. Registration is also mandatory, if goods from other EU countries are acquired for at least € 14,000.

Luxembourg

Luxembourg does not provide any tax incentives that refer specifically to SMEs as defined by the European Commission. However, small companies in particular should benefit from the reduced corporate income tax rate of 20% (instead of 21%) that applies to companies with an income below € 15,000 as well as from the progressive schedule of the minimum tax. (The amount of minimum tax payable depends on the balance sheet total.) Moreover, income up to € 17,500 is not subject to the municipal business tax. The generally applicable tax credit (7% or 8% on qualifying tangible and depreciable assets) may also favor SMEs as it is capped at € 150,000. Beyond the threshold, only 2% of the qualifying expenditure is creditable. Further advantages for SMEs include higher non-tax grants for R&D projects.

25% of the income by certain new businesses fostering the growth of the economy may be exempt from corporate income taxation.

There are also incentives for venture capital investments. Special venture capital vehicles (SICAR) are exempt from corporate income tax and qualifying investments up to € 5 million or 30% of taxable income, respectively, can be deducted from the tax base by investors. The latter relief only applies if the capital finances enterprises that introduce new technologies or fabrications.

For VAT purposes, enterprises do only have to register if their turnover does exceed € 25,000 or intra-community acquisitions exceed € 10,000. Returns need to be filed annually if the

turnover is below € 112,000 and quarterly if it is below € 620,000 (instead of monthly). VAT can be paid on a cash basis (receipts method) if the turnover of the taxpayer is below € 500,000.

Malta

Malta provides SMEs with increased tax credits for new investments or major extensions of existing operations in a multitude of manufacturing and service industries. Eligible activities include:

- production, manufacturing and processing of goods, materials, commodities, equipment, plant and machinery;
- activities related to information technology,
- call centers
- R&D and innovation of products and processes as well as activities related eco-innovation, water treatment, environmental solutions and biotechnology;
- tertiary education, filming and cultural restoration as well as the provision of large-scale cultural, creative and trade facilities
- private healthcare services.

Creditable costs include expenditures in tangible or intangible assets incurred by such undertakings in the preceding year or wage costs for jobs directly created by the initial investment. Taxpayers may deduct 35% (micro and small undertakings) or 25% of eligible costs from their tax liabilities (instead of 15% for large enterprises). Cash grants are available instead of the tax credit if the makes a substantial contribution to the economic development of Malta. SMEs are defined according to the definition of the European Commission.

An extra credit is available for research projects. The size of the credit is measured as a percentage of eligible personnel costs, current costs, overhead, costs for contract research (not more than 25% of total eligible costs), costs for registering intellectual property (IP), depreciation of land and buildings and capital expenditures for fixed assets other than land and buildings. Eligible percentages are as follows:

- small and micro enterprises: 70% for industrial research projects (80% for collaborative projects with research and knowledge-dissemination organizations); 45% for experimental research projects (60% for collaborative projects);
- medium-sized enterprises: 60% for industrial research projects (75% for collaborative projects); 35% for experimental research projects (50% for collaborative projects);
- large enterprises: 50% for industrial research projects (65% for collaborative projects); 25% for experimental research projects (40% for collaborative projects).

Projects must be finished within three years in order to be eligible. Unused credits can be carried forward indefinitely.

Another tax credit exists for small enterprises. The credit amounts to 45% (65% in the region of Gozo) of wage costs for new employees, refurbishing costs and costs incurred for machinery, equipment and technology. The maximum credit amounts to € 30,000 (€ 50,000 for start-ups). Eligible businesses must have at least one and less than 30 full-time employees, a turnover of less than € 10 million and be registered for the value-added tax and not be part of a group.

Enterprises are exempt from VAT if their turnover does not exceed € 35,000 (supply of goods), € 24,000 (supply of service with low value added) or € 14,000 (other activities), respectively. Professional service providers and retailers with less than € 2 million of turnover may account for VAT on a cash basis.

Netherlands

The Netherlands do not provide any incentives that are exclusively restricted to small and medium-sized enterprises. Some provisions, however, particularly benefit SMEs due to maximum absolute thresholds limiting eligible income or expenses. First, there is a progressive corporate income tax schedule in place that taxes income up to € 200,000 at 20% and the excess at 25%.

Second, the general investment deduction for small-scale investments in certain assets is only applicable if the total annual qualifying costs are between € 2,300 and € 309,693. Moreover,

the deductible percentage decreases as eligible costs increase. The following sliding scale applies:

- 28% if the total of qualifying investments is between € 2,300 and € 55,745;
- € 15,609 if the total of qualifying investments is between € 55,745 and € 103,231;
- € 15,609 less 7.56% of the invested amount exceeding € 103,231 if the total of qualifying investments is between € 103,231 and € 309,693;
- 0% if the total of qualifying investments exceeds € 309,693.

The thresholds and deductible amounts are adjusted for inflation annually.

A regime of free depreciation was introduced in 2015. It applies to certain assets that are in the interest of the furtherance of economic development with a maximum investment value of € 25 million. Beyond the threshold EU admission is necessary. For R&D activities, a wage tax reduction of 35% for involved employees is available up to € 250,000 per employee (50% for start-ups). Beyond the threshold, only 14% of eligible wage costs can be deducted. The maximum deduction amounts to € 14 million. Another deduction applies to individual entrepreneurs conducting R&D. They are entitled to a lump-sum allowance of € 12,310 or € 18,467 for the first five years of his entrepreneurial activity. Net losses arising from this deduction can be carried back for three years or carried forward for nine years.

For VAT purposes, businesses may make quarterly payments if the amount payable per quarter does not exceed € 7,000 (instead of monthly). Yearly payments are allowed if quarterly amounts are below € 2,000. Natural persons whose VAT liability does not exceed € 1,883 are fully exempt from VAT.

Poland

Poland provides several tax incentives for SMEs. First, small and medium-sized enterprises may receive a tax credit of up to 75% of investment costs for investing in new technologies. The credit must not exceed 70% of the sales value of the products produced with the new technology. Lower percentages may apply depending on the size of the company and the project location. The technology needs to be new and sufficiently innovative (must not have been used for more than five years globally). The maximum credit is PLN 4 million (\approx € 950,000)

and the project must not involve investments of more than € 50 million. SMEs are defined according to the definition by the European Commission.

Second, SMEs receive tax benefits if they invest in so-called special economic zones. For investments of at least € 100,000, enterprises benefit from investment allowances on either the investment costs (costs for land and buildings only enter the calculation base with 5% and 40%, respectively) or the personnel costs of newly hired employees over two years. While large enterprises can only apply an allowance of 30% to 50% (depending on the zone), medium-sized enterprises are entitled to an additional 10% and small enterprises to an additional 20%. In order to be eligible for the allowance, activities must be carried on for at least 3 years without changing ownership and new jobs must be created and kept for this period.

A special regime of depreciation is also in place in Poland. Under the regime, enterprises with a turnover (incl. VAT) of less than € 1.2 million are allowed to immediately depreciate the costs of certain fixed assets up to an amount of € 50,000. The same exception applies to start-ups. The latter may also get a waiver for the income tax due in the first or second year of operations (depending on the exact date of initiation) if they are small or micro companies. The tax, however, must be repaid in the subsequent five years in equal instalments.

For the VAT purposes, small taxpayers with less than € 1.2 million of turnover (incl. VAT) can opt for quarterly tax payments instead of monthly payments. Moreover, cash-basis accounting is available for these enterprises. Eligible taxpayers can also opt for quarterly advance income tax payments instead of monthly.

Portugal

Portugal offers various kinds of tax incentives targeted at SMEs. Starting with the corporate income tax rate, the first € 15,000 of income of SMEs (according to the definition of the European Commission) are taxed at a reduced rate of 17% (instead of 23%). Moreover, SMEs benefit from the progressive structure of the state surtax that is levied at the following rates (for all enterprises irrespective of their size):

- 0% on income up to € 1.5 million;
- 3% on income between € 1.5 million and € 7.5 million;
- 5% on income between € 7.5 million and € 35 million;

- 7% on income beyond € 35 million.

Tax credits are also available for SMEs in Portugal. First, there is a credit of 10% on retained earnings. The credited amount needs to be reinvested in eligible assets within two years. Another credit is granted for R&D expenditures (capital expenditure excluding land and buildings, costs for personnel and contract research and other operating costs). While the creditable amount is generally calculated as 32.5% of eligible costs, new SMEs can claim 47.5%.⁵¹⁶ In addition, they may include 100% of personnel costs instead of only 90% as is usual. Unused credits can be carried forward for six years.

The third credit refers to investments that are designed to internationalize the Portuguese economy. The credit is available to all enterprises for non-EU member states but is restricted to SMEs for investments within the EU. The minimum investment is € 250,000 and the credit amounts to 10-20% of the investment. It must neither exceed 25% of the tax liability nor € 997,595.79. There is also an exemption of dividends from non-resident subsidiaries that is restricted to non-EU countries for large companies whereas SMEs can benefit in both the EU and non-member states. In order to be eligible, the holding must be at least 10% one year prior to the dividend, the investment must have led to a newly created non-resident company or an acquisition of such and the investment must have amounted to at least € 250.000.

Another investment tax credit applies to all enterprises but is especially beneficial to SMEs as smaller investment amounts are promoted more generously in relative terms. The credit reduces the income tax payable by 25% of investments in fixed assets up to € 5 million. Beyond this threshold only 10% are deductible and the credit must not exceed 50% of the tax liability. For start-ups, the credit may amount to 100% of the tax liability in the first three years of operations. The incentive only applies in certain sectors such as tourism and mining and requires an investment period of at least five years. The credit can be carried forward for 4 years. The incentive also includes exemptions from the property tax, the property transfer tax and stamp duties on acquired land. On the other hand, SMEs may be disadvantaged with regard to contractual tax incentives for so-called strategic investment that are only granted if certain minimum investments are made (€ 3 million). The related tax credit of 10% to 25% is also accompanied by exemptions from property tax, the property transfer tax and stamp duties.

⁵¹⁶ In addition, an incremental tax credit (50%) is available for all businesses on all eligible R&D expenditures as far as they exceed the average spending of the previous two fiscal years.

A deduction of 5% from taxable income applies to SMEs on all capital contributions in cash by shareholders upon incorporation or subsequent capital increases. Eligible SMEs must be owned by individuals or qualifying venture capital investors. Shareholders on the other hand are exempt from taxation with 50% of their capital gains from the sale of participations in unlisted small and micro companies.

For micro companies – either incorporated or not incorporated – Portugal also offers a very simplified accounting regime to determine taxable income. It applied to micro enterprises that fulfill the following criteria:

- no. of employees ≤ 5 ;
- turnover $\leq \text{€ } 500,000$;
- balance sheet total $\leq \text{€ } 500,000$;
- income $\leq \text{€ } 200,000$.

If these criteria are met, small businesses may determine taxable income as follows:

- 4% of sales and services rendered for hotel, food and beverage activities;
- 75% of income derived from the official schedule of activities approved by order of the Minister of Finance
- 10% of remaining income arising from services and business-related subsidies
- 95% of income from the sale or temporary use of rights of intellectual or industrial property and other investment income
- 100% of acquisition value of charge increases in wealth

Another simplified accounting system is in place for enterprises that fulfill the following criteria:

- no. of employees ≤ 50
- turnover $\leq \text{€ } 3$ million
- balance sheet total $\leq \text{€ } 1,5$ million

Further administrative reliefs for micro enterprises exist with regard to the value-added tax. While individual entrepreneurs with a turnover of less than € 9,976 are completely exempt, enterprises with less than € 650,000 do only need to file quarterly returns (instead of monthly). Micro enterprises are also subject to reduced periods of safekeeping for supporting documents.

Romania

Romania provides a mandatory special tax regime for micro companies under which corporate income tax has to be paid at 3% on turnover. The regime applies to fully privately owned enterprises with income below € 65,000 except for enterprises deriving income in the banking, gambling, consultancy or management sector. Before being repealed in 2010 and re-introduced in 2011, the regime used to be applied on a voluntary basis.

If businesses do not have more than € 65,000 of turnover, they are also exempt from the value-added tax.

Slovak Republic

The Slovak Republic does not have any specific tax provisions for small and medium-sized enterprises except for size-adjusted eligibility criteria for R&D investment incentives. Small enterprises may even be disadvantaged with regard to some investment incentives as these require minimum investments of up to € 3 million.

For new companies, start-up expenses are deductible when incurred.

For VAT purposes, small businesses are exempt if their turnover is below € 49,790.

Slovenia

Slovenia does not provide tax incentives specifically designed for SMEs. They are, however, subject to less restrictive holding requirements (3 instead of 5 years) for assets that qualify for the investment deduction in the region of Pomurje. The deduction amounts to 70% of incurred costs of eligible equipment and intangibles with a maximum allowance of € 30,000. There is also a general investment allowance of 40% of expenditures on intangibles and equipment in place, the maximum threshold of € 30,000 for this allowance has been abolished, though. Consequently, there is no advantage for SMEs compared to large enterprises.

Venture capital companies are generally tax exempt with their investments.

Administratively, there are some minor reliefs for SMEs reduced penalties in case of insufficient or delayed tax payments or shortened audit periods. Moreover, businesses are exempt from the value-added tax if their turnover does not exceed € 50,000.

Spain

Spain is a country with multiple kinds of tax incentives for SMEs. Accelerated depreciation is offered as well as allowances, tax credits and special tax rates. In order to be considered an SME, firms generally need to have a turnover below € 10 million (€ 8 million until 2010).

There are two schemes of accelerated depreciation. The first one allows depreciation at 200% of the normal rates. The regime includes all newly acquired tangible fixed and intangible assets. Alternatively, free depreciation is available for SMEs if they increase the annual average of personnel in the 24 months following the first use of the asset. The maximum amount to be freely depreciated equals the product of € 120,000 and the percentage increase in personnel. Assets with acquisition costs below € 601.01 maybe freely depreciated up to a threshold of € 12,020.24 in any case. In 2013 and 2014, there were further schemes that allowed SMEs to depreciate all tangible fixed assets if they were purchased with proceeds stemming from capital gains. Moreover, ordinary depreciation rates for tangible fixed assets, intangibles and immovable property were not temporarily reduced by 30% as was the case for large enterprises.

SMEs with less than 50 employees also qualify for two tax credits that are granted for the hiring of new employees with indefinite full-time employment contracts. The first one amounts to € 3,000 for each new employee under the age of 30. The other tax credit is provided for the hiring of employees who have received unemployment payments for at least three months at the time of hiring. The latter one yields 50% of the outstanding unemployment payments for one year for the enterprise as well as 25% of the outstanding payments for the employee. The R&D and innovation tax credits may also favor SMEs as they are capped at € 3 million and € 1 million, respectively.

Besides tax credits and accelerated depreciation schemes, special corporate income tax rates apply for SMEs which meet the following criteria:

- net revenue \leq € 5 million;
- no. of employees \leq 25;
- level of employment needs to be retained or increased relative to 2009.

If the criteria are met, a special corporate income tax rate of 20% applies for the first € 300,000 of income. All income beyond the threshold is taxed at 25%. SMEs that do not meet the above criteria incur a reduced tax rate of 25% on the first € 300,000 of income instead of being subject to the standard CIT rate of 28%. The normal rate, however, will be further decreased to 25% in 2016 (coming from 30% in 2014) thus making the special rate irrelevant. Another rate exists for newly founded companies (not only SMEs) that are not part of a group. In their first two years with positive income, they are subject to a CIT rate of only 15% on their first € 300,000 of income and 20% on income beyond the threshold. The newly founded company must not be held by shareholders having performed similar activities before in order to be eligible.

Further SME tax rates apply in several regions of Spain. In Alava, Vizcaya and Guipúzcoa, a special rate of 24% applies to SMEs (instead of the usual 28% in Basque Country). In Navarre, a rate of 23% (19%) instead of 25% applies for SMEs that employ at least one person and have an annual turnover below € 9 million (€ 1 million). A slight disadvantage for SMEs is the regressive structure of the surcharge for members of the Chamber of Commerce. While 0.75% is charged on income up to € 60,101, the rate decreases gradually to only 0.01% on income beyond € 24 million. The surcharge is tax deductible though.

Besides the abovementioned provisions, Spain offers the following tax incentives for SMEs:

- exemption from the local business tax (IAE) if turnover is below € 1 million;
- special deduction of up to 10% of taxable income; deduction must enter a special reserve that is used in the following 5 years to balance out tax losses (otherwise taxation at the end of the 5-year period);
- option to establish a special provision for bad debt not qualifying for the general provision. The maximum provision amounts to 1% of the existing balance of debt at the end of the tax period;
- exemption of 99% of gains from venture capital investments in non-financial SMEs operating in the field of technological innovation by qualifying venture capital companies and funds; exemption includes gains from the sale of shares and other participations that have been held for at least one and not more than 15 years. (An extension to 20 years may be granted.)

With regard to administrative facilitations, Spain offers relaxed transfer pricing requirements for all SMEs with intercompany transactions below € 100,000. For VAT purposes, a special regime of cash accounting can be applied if an enterprise's turnover does not exceed € 2 million. If turnover is below € 35,000, only annual VAT returns need to be filed.

Sweden

Sweden does not provide any tax incentives directly targeted at SMEs. Individual investors, however, can claim a deduction of 50% of the acquisition costs they incur when acquiring shares of small companies at the formation or subsequent share issuances. The shares must be held for at least five years. The deduction can be made from capital income. The maximum deduction amounts to SEK 650,000 (\approx € 100,000). The maximum total investment per company is SEK 20 million (\approx € 3 million) per year. Furthermore the company must fulfill the following criteria (on a group level):

- payment of annual salaries of at least SEK 300,000 (\approx € 45,000);
- fewer than 50 employees or active partners;
- net turnover \leq SEK 80 million (\approx € 12 million);
- balance sheet total \leq SEK 80 million (\approx € 12 million).

For VAT purposes, businesses can use cash-based accounting if their turnover does not exceed SEK 3 million (\approx € 450,000). Returns have to be filed monthly unless the turnover does not exceed SEK 40 million (\approx € 6 million). Then quarterly returns are sufficient. Enterprises with a turnover of less than SEK 1 million (\approx € 150,000) can opt for yearly returns. No registration threshold exists.

United Kingdom

The United Kingdom provides an investment allowance for R&D activities that is especially beneficial for SMEs. Under the regime, all enterprises are allowed to deduct an additional 30% of their R&D expenses from taxable income (only revenue expenditure, no capital expenditure). SMEs, however, are entitled to an additional 100%, resulting in a total allowance of 130%. In order to be eligible, the following criteria need to be met:

- number of employees ≤ 500 ;
- turnover $\leq \text{€ } 100$ million;
- balance sheet total $\leq \text{€ } 86$ million.

Loss-making SMEs may surrender their R&D losses in return for a tax credit equal 14.5% of the underlying loss. The credit is refunded immediately. The relief from the SME-specific regime must not exceed £ 7.5 million ($\approx \text{€ } 9$ million). If an SME incurs eligible expenditures beyond the threshold, however, the scheme for large enterprises applies.

Further provisions that may benefit SMEs include the following:

- There is an annual investment allowance of 100% on the first £ 500,000 ($\approx \text{€ } 650,000$) of expenditure on plant and machinery in place. Alternatively, a first-year allowance for certain assets can be claimed. Both incentives are generally applicable and not restricted to SMEs.
- There is no cap on deductible external finance expenses if an SME is part of a taxable group.
- Special corporate income tax rates apply for companies engaged in the production of oil and gas: income up to £ 300,000 ($\approx \text{€ } 400,000$) is taxed at a rate of 19% instead of 30%; marginal relief is available for income up to £ 1.5 million ($\approx \text{€ } 2$ million).
- SMEs are subject to simplified provisions for the valuation of intellectual property.

With regard to the value-added tax, enterprises are exempt if their annual turnover does not exceed £ 81,000 ($\approx \text{€ } 100,000$). A simplified VAT scheme applies for enterprises with a turnover below £ 150,000 ($\approx \text{€ } 200,000$) and cash-based accounting for VAT is allowed up to £ 1.35 million ($\approx \text{€ } 1.8$ million).

Annex 2: Empirical Studies on the Relation of Firm Size and Job Creation

Table A1: Empirical studies on the relationship of firm size, firm growth and job creation

Author(s)	Year	Publication	Data	Estimation design	Main findings
Amirkhalkhali/Mukhopadhyay	1993	Eastern Economic Journal	<ul style="list-style-type: none"> • large U.S. firms • all sectors • 1965–1987 	<ul style="list-style-type: none"> • regression 	<ul style="list-style-type: none"> • negative relationship between firm size and firm growth (employment)
Armington/Odle	1982	The Brookings Review	<ul style="list-style-type: none"> • U.S. establishments (private sector) • all sectors • 1978-1980 	<ul style="list-style-type: none"> • comparison of growth rates by size classes 	<ul style="list-style-type: none"> • negative relationship between establishment size and rate of net job creation
Audretsch/Elston	2006	Entrepreneurship, Growth, and Innovation (textbook)	<ul style="list-style-type: none"> • all publicly traded German firms • all sectors • 1970–1984 	<ul style="list-style-type: none"> • regression 	<ul style="list-style-type: none"> • positive relationship between firm size and firm growth (employment)
Audretsch/Klomp/Santarelli/Thurik	2004	Review of Industrial Organization	<ul style="list-style-type: none"> • Dutch firms • hospitality sector • 1987–1991 	<ul style="list-style-type: none"> • regression • comparison of growth rates by size classes 	<ul style="list-style-type: none"> • no clear relationship between firm size and firm growth (employment)
Audretsch/Santarelli/Vivarelli	1999	International Journal of Industrial Economics	<ul style="list-style-type: none"> • Italian start-ups • manufacturing • 1987–1993 	<ul style="list-style-type: none"> • regression 	<ul style="list-style-type: none"> • negative relationship between firm size and firm growth (employment) among surviving start-ups
Baldwin/Picot	1995	Small Business Economics	<ul style="list-style-type: none"> • Canadian firms • manufacturing • 1970–1990 	<ul style="list-style-type: none"> • comparison of growth rates by size classes 	<ul style="list-style-type: none"> • negative relationship between plant size and rate of net job creation • negative net job creation among large plants
Barnes/Haskel	2002	Working paper	<ul style="list-style-type: none"> • UK firms • manufacturing • 1980–1991 	<ul style="list-style-type: none"> • comparison of growth rates by size classes 	<ul style="list-style-type: none"> • negative relationship between establishment size and rate of net/ job creation • negative net job creation among establishments with 20+ employees

Author(s)	Year	Publication	Data	Estimation design	Main findings
Becchetti/Trovato	2002	Small Business Economics	<ul style="list-style-type: none"> • Italian firms (10+ employees) • manufacturing • 1989–1997 	<ul style="list-style-type: none"> • regression 	<ul style="list-style-type: none"> • negative relationship between firm size and firm growth (employment) among firms with less than 100 employees • no clear relationship between firm size and firm growth (employment) among firms with 100+ employees
Birch	1981	The Public Interest	<ul style="list-style-type: none"> • U.S. establishments • all sectors • 1969–1976 	<ul style="list-style-type: none"> • comparison of growth rates by size classes 	<ul style="list-style-type: none"> • negative relationship between firm size and rate of net job creation • new businesses account for majority of job creation
Birch	1987	Job Creation in America (textbook)	<ul style="list-style-type: none"> • U.S. establishments • all sectors • 1969–1985 	<ul style="list-style-type: none"> • comparison of growth rates by size classes / age classes 	<ul style="list-style-type: none"> • negative relationship between establishment size and rate of net job creation (except for very large establishments) • negative net job creation among establishments with 100+ employees
Bottazzi/Dosi/Lippi/Pammolli/Riccaboni	2001	International Journal of Industrial Organization	<ul style="list-style-type: none"> • large international firms • pharmaceutical sector • 1987–1997 	<ul style="list-style-type: none"> • comparison of size distribution functions 	<ul style="list-style-type: none"> • no clear relationship between firm size and firm growth (employment)
Broersma/Gautier	1997	Small Business Economics	<ul style="list-style-type: none"> • all Dutch firms (10+ employees) • manufacturing • 1978–1991 	<ul style="list-style-type: none"> • comparison of growth rates by size classes 	<ul style="list-style-type: none"> • negative relationship between firm size and rate of net/gross job creation • negative net job creation among firms with 50+ employees • only new businesses account for positive net job creation
Buckley/Dunning	1984	Kyklos	<ul style="list-style-type: none"> • large international firms • industrial firms • 1972–1977 	<ul style="list-style-type: none"> • regression 	<ul style="list-style-type: none"> • negative relationship between firm size and firm growth (sales)

Author(s)	Year	Publication	Data	Estimation design	Main findings
Cefis/Ciccarelli/Orsenigo	2007	Structural Change and Economic Dynamics	<ul style="list-style-type: none"> Italian firms pharmaceutical industry 1987–1998 	<ul style="list-style-type: none"> Bayesian hierarchical model estimation 	<ul style="list-style-type: none"> no clear relationship between firm size and firm growth (employment)
Chen/Lu	2003	Applied Economics Letters	<ul style="list-style-type: none"> publicly traded Taiwanese firms all sectors 1988–1999 	<ul style="list-style-type: none"> regression 	<ul style="list-style-type: none"> negative relationship between firm size and firm growth (fixed assets) only in some sectors
Davidsson/Lindmark/Olofsson	1998	Small Business Economics	<ul style="list-style-type: none"> all Swedish plants all sectors 1989-1994 	<ul style="list-style-type: none"> comparison of growth rates by size classes 	<ul style="list-style-type: none"> negative relationship between firm size and firm growth (employment) negative relationship between firm age and firm growth (employment)
Davis/Haltiwanger/Schuh	1996	Small Business Economics	<ul style="list-style-type: none"> U.S. plants manufacturing 1972–1988 	<ul style="list-style-type: none"> comparison of growth rates by size classes 	<ul style="list-style-type: none"> no clear relationship between plant size and net job creation (contrary results driven by methodological problems)
Davis/Haltiwanger/ Schuh	1996	Job Creation and Destruction (textbook)	<ul style="list-style-type: none"> U.S. plants manufacturing 1972–1988 	<ul style="list-style-type: none"> comparison of growth rates by size classes 	<ul style="list-style-type: none"> no clear relationship between plant size and net job creation only new plants (5 years) account for net job creation positive net job creation by large plants
de Wit/de Kok	2014	Small Business Economics	<ul style="list-style-type: none"> population of EU-27 businesses all sectors 2002–2012 	<ul style="list-style-type: none"> comparison of growth rates by size classes 	<ul style="list-style-type: none"> negative relationship between firm size and rate of net job creation (decreases in firm size at diminishing rate)
de Kok/Vroonhof/Verhoeven/ Timmermans/Kwaak/Snijders/ Westhof	2011	Project report	<ul style="list-style-type: none"> all EU firms all sectors 2002–2010 	<ul style="list-style-type: none"> comparison of growth rates by size classes 	<ul style="list-style-type: none"> negative relationship between firm size and rate of net job creation
Del Monte/Papagni	2003	Research Policy	<ul style="list-style-type: none"> Italian firms manufacturing 1989–1997 	<ul style="list-style-type: none"> regression 	<ul style="list-style-type: none"> no clear relationship between firm size and firm growth (sales)

Author(s)	Year	Publication	Data	Estimation design	Main findings
Droucopoulos	1982	Journal of Economic Studies	<ul style="list-style-type: none"> • large international firms • all sectors • 1957–1977 	<ul style="list-style-type: none"> • regression • comparison of growth rates by size classes 	<ul style="list-style-type: none"> • no clear relationship between firm size and firm growth (sales)
Dunne/Hughes	1994	Journal of Industrial Economics	<ul style="list-style-type: none"> • large UK firms • all sectors • 1975–1985 	<ul style="list-style-type: none"> • regression • comparison of growth rates by size classes 	<ul style="list-style-type: none"> • negative relationship between firm size and rate of net job creation (decreases in firm size at diminishing rate) • negative relationship between firm age and firm growth (employment)
Dunne/Roberts/Samuelson	1989	Quarterly Journal of Economics	<ul style="list-style-type: none"> • all U.S. start-ups • 1967–1977 • manufacturing 	<ul style="list-style-type: none"> • regression • comparison of growth rates by size and age classes 	<ul style="list-style-type: none"> • negative relationship between plant size and plant growth (employment) • negative relationship between plant age and plant growth (employment)
European Commission	2015	Annual Report on European SMEs	<ul style="list-style-type: none"> • all firms in EU • 2008–2012 • all sectors 	<ul style="list-style-type: none"> • comparison of growth rates by size classes 	<ul style="list-style-type: none"> • no clear relationship between firm size and firm growth (employment)
Evans	1987	Journal of Industrial Economics	<ul style="list-style-type: none"> • U.S. firms • manufacturing • 1976–1982 	<ul style="list-style-type: none"> • regression 	<ul style="list-style-type: none"> • negative relationship between firm size and firm growth (rate of employment growth decreases in firm size at diminishing rate)
Evans	1987	Journal of Political Economy	<ul style="list-style-type: none"> • U.S. firms • manufacturing • 1976–1982 	<ul style="list-style-type: none"> • regression 	<ul style="list-style-type: none"> • negative relationship between firm size and firm growth (rate of employment growth decreases in firm size at diminishing rate) • negative relationship between firm age and firm growth
Fariñas/Moreno	2000	Review of Industrial Organization	<ul style="list-style-type: none"> • Spanish firms • manufacturing • 1990–1995 	<ul style="list-style-type: none"> • regression 	<ul style="list-style-type: none"> • negative relationship between firm size and firm growth (employment) • negative relationship between firm age and firm growth (employment)

Author(s)	Year	Publication	Data	Estimation design	Main findings
Gallagher/Daly/Thomason	1991	Small Business Economics	<ul style="list-style-type: none"> • UK firms • all sectors • 1985–1987 	<ul style="list-style-type: none"> • comparison of growth rates by size classes 	<ul style="list-style-type: none"> • negative relationship between firm size and firm growth (employment) • negative net job creation by large firms (1000+ employees)
Haltiwanger/Jarmin/Miranda	2013	The Review of Economics and Statistics	<ul style="list-style-type: none"> • all U.S. establishments • all sectors • 1992–2005 	<ul style="list-style-type: none"> • comparison of growth rates by size classes / age classes 	<ul style="list-style-type: none"> • no clear relationship between firm size and firm growth (employment) if controlled for firm age • only new businesses with positive net job creation
Hall, B. H.	1987	Journal of Industrial Economics	<ul style="list-style-type: none"> • publicly traded U.S. firms • manufacturing • 1972–1983 	<ul style="list-style-type: none"> • regression 	<ul style="list-style-type: none"> • negative relationship between firm size and firm growth (employment)
Harhoff/Stahl/Woywode	1998	Journal of Industrial Economics	<ul style="list-style-type: none"> • German firms • all sectors • 1989–1994 	<ul style="list-style-type: none"> • comparison of growth rates by size / age classes • regression 	<ul style="list-style-type: none"> • negative relationship between firm size and firm growth (employment) • negative relationship between firm age and firm growth (employment)
Hart	1962	Economica	<ul style="list-style-type: none"> • U.S. and UK firms • manufacturing • 1931–1960 	<ul style="list-style-type: none"> • comparison of growth rates by size classes 	<ul style="list-style-type: none"> • no clear relationship between firm size and firm growth (employment)
Headd	2010	Working paper	<ul style="list-style-type: none"> • U.S. establishments • all sectors • 1998–2006 	<ul style="list-style-type: none"> • comparison of growth rates by size classes 	<ul style="list-style-type: none"> • negative relationship between firm size and firm growth (employment)
Headd/Kirchhoff	2009	Journal of Small Business Management	<ul style="list-style-type: none"> • all single-establishment firms (1+ employees) • all sectors • 1992–2002 	<ul style="list-style-type: none"> • comparison of growth rates by size classes / age classes 	<ul style="list-style-type: none"> • negative relationship between firm age and firm growth (employment) • most firms do not grow much after start up
Heshmati	2001	Small Business Economics	<ul style="list-style-type: none"> • all small firms (Gävleborg) • all sectors • 1993–1998 	<ul style="list-style-type: none"> • regression 	<ul style="list-style-type: none"> • no clear relationship between firm size and firm growth: negative for employment, positive for sales growth negatively related to size

Author(s)	Year	Publication	Data	Estimation design	Main findings
Hohti	2000	Small Business Economics	<ul style="list-style-type: none"> • all Finnish establishments (5+ employees) • manufacturing • 1980–1994 	<ul style="list-style-type: none"> • comparison of growth rates by size classes 	<ul style="list-style-type: none"> • no clear relationships between establishment size and establishment growth (employment)
Hymer/Pashigan	1962	Journal of Political Economy	<ul style="list-style-type: none"> • largest U.S. firms • manufacturing • 1946–1955 	<ul style="list-style-type: none"> • regression 	<ul style="list-style-type: none"> • no clear relationship between firm size and firm growth (employment)
Kirchhoff/Phillips	1988	Journal of Business Venturing	<ul style="list-style-type: none"> • U.S. firms • manufacturing • 1976–1984 	<ul style="list-style-type: none"> • comparison of growth rates by size classes 	<ul style="list-style-type: none"> • negative relationship between firm size and rate of net job creation • new firms account for majority of net job creation
Kumar	1985	Journal of Industrial Economics	<ul style="list-style-type: none"> • quoted UK firms • all sectors • 1960–1976 	<ul style="list-style-type: none"> • regression 	<ul style="list-style-type: none"> • slightly negative relationship between firm size and rate of net job creation
Liu/Tsou/Hammitt	1999	Economics Letters	<ul style="list-style-type: none"> • Taiwanese firms • manufacturing • 1990–1994 	<ul style="list-style-type: none"> • regression 	<ul style="list-style-type: none"> • negative relationship between plant size and plant growth (employment) • negative relationship between plant age and plant growth (employment)
Lotti	2007	Industrial and Corporate Change	<ul style="list-style-type: none"> • Italian firms • manufacturing and service • 1993–1998 	<ul style="list-style-type: none"> • regression • comparison of growth rates by size classes / age classes 	<ul style="list-style-type: none"> • negative relationship between firm size and firm growth (rate of employment growth decreases in firm size at diminishing rate) • negative relationship between firm age and firm growth (employment)
Lotti/Santarelli/Vivarello	2003	Journal of Evolutionary Economics	<ul style="list-style-type: none"> • all new firms (1+ employees) • manufacturing • 1987–1993 	<ul style="list-style-type: none"> • regression 	<ul style="list-style-type: none"> • negative relationship between firm size and firm growth (employment) only for new and small firms
Mansfield	1962	The American Economic Review	<ul style="list-style-type: none"> • large U.S. firms • manufacturing sector • 1916–1959 	<ul style="list-style-type: none"> • regression 	<ul style="list-style-type: none"> • negative relationship between firm size and firm growth (employment) among surviving firms

Author(s)	Year	Publication	Data	Estimation design	Main findings
Mata/Portugal	1994	Journal of Industrial Economics	<ul style="list-style-type: none"> • all Portuguese start-ups (5+ employees) • manufacturing • 1981–1988 	<ul style="list-style-type: none"> • comparison of numbers of firms in size classes 	<ul style="list-style-type: none"> • negative relationship between firm size and firm growth (employment)
Mata/Portugal/Guimaraes	1995	International Journal of Industrial Organization	<ul style="list-style-type: none"> • all Portuguese plants • manufacturing • 1981–1990 	<ul style="list-style-type: none"> • regression 	<ul style="list-style-type: none"> • negative relationship between firm size and firm growth (employment)
Mohnen/Nasev	2008	Betriebswirtschaftliche Forschung und Praxis	<ul style="list-style-type: none"> • German SMEs • all sectors • 2001–2003 	<ul style="list-style-type: none"> • regression 	<ul style="list-style-type: none"> • negative relationship between firm size and firm growth (employment) • negative relationship between firm age and firm growth (employment) only among new firms
Neumark/Wall/Zhang	2011	The Review of Economics and Statistics	<ul style="list-style-type: none"> • all U.S. establishments • all sectors • 1992–2004 	<ul style="list-style-type: none"> • comparison of growth rates by size classes 	<ul style="list-style-type: none"> • negative relationship between firm size and firm growth (employment) • only small firms (max. 20 employees) with positive net job creation
Samuels	1965	Review of Economic Studies	<ul style="list-style-type: none"> • U.S. firms • all sectors • 1950–1960 	<ul style="list-style-type: none"> • comparison of growth rates by size classes 	<ul style="list-style-type: none"> • positive relationship between firm size and firm growth (employment) among surviving firms
Santarelli/Vivarelli	2002	Industrial and Corporate Change	<ul style="list-style-type: none"> • Italian start-ups • electrical/electronic engineering • 1987–1993 	<ul style="list-style-type: none"> • regression • comparison of growth rates by size classes 	<ul style="list-style-type: none"> • negative relationship between firm size and firm growth (employment); less pronounced among established firms • negative relationship between firm age and firm growth (employment)
Singh/Whittington	1975	Review of Economic Studies	<ul style="list-style-type: none"> • all quoted UK firms • all sectors • 1948–1960 	<ul style="list-style-type: none"> • regression • comparison of growth rates by size classes 	<ul style="list-style-type: none"> • positive relationship between firm size and firm growth (employment) among surviving firms
Tang	2015	Empirical Economics	<ul style="list-style-type: none"> • all Swedish companies • energy sector • 1997–2011 	<ul style="list-style-type: none"> • regression 	<ul style="list-style-type: none"> • negative relationship between firm size and firm growth (employment) but only for young firms

Author(s)	Year	Publication	Data	Estimation design	Main findings
Variyam/Kraybill	1992	Economics Letters	<ul style="list-style-type: none"> • SMEs in Georgia • all sectors • 1986–1991 	<ul style="list-style-type: none"> • regression 	<ul style="list-style-type: none"> • negative relationship between firm size and firm growth (employment) • negative relationship between firm age and firm growth (employment)
Voulgaris/Papadogonas/Agiomirigianakis	2005	Review of Development Economics	<ul style="list-style-type: none"> • all Greek firms • manufacturing • 1995–1999 	<ul style="list-style-type: none"> • regression • comparison of growth rates by size classes / age classes 	<ul style="list-style-type: none"> • negative relationship between firm size and firm growth (employment) • negative relationship between firm age and firm growth (employment) • only young firms (5 years) with positive net job creation

Annex 3: Loss Compensation Rules for Business Income

Table A2: Loss compensation rules for business losses in the EU (2015)

Country	CIT Loss Offset		PIT Loss Offset	
	Carry Back	Carry Forward	Carry Back	Carry Forward
Austria	-	<ul style="list-style-type: none"> • unlimited carry forward • max. annual offset: 75% of taxable income 		<ul style="list-style-type: none"> • unlimited carry forward of business losses (limited to 1 year for other losses) • capital losses can only be offset against capital gains
Belgium	-	<ul style="list-style-type: none"> • unlimited • loss trafficking rules apply if change of ownership not justified by financial and economic needs 		<ul style="list-style-type: none"> • unlimited for business losses • capital losses can only be offset against capital gains
Bulgaria		<ul style="list-style-type: none"> • limited to 5 years • loss-trafficking rules apply for restructurings other than mere change of legal form 		<ul style="list-style-type: none"> • limited to 5 years
Croatia	-	<ul style="list-style-type: none"> • limited to 5 years 		<ul style="list-style-type: none"> • limited to 5 years • capital losses can only be offset against capital gains
Cyprus	-	<ul style="list-style-type: none"> • limited to 5 years • unlimited offset for losses from disposal of immovable property in Cyprus against taxable capital gains in future years • loss-trafficking rules apply for change of ownership and a substantial change in the business of the company within 3 years 		<ul style="list-style-type: none"> • limited to 5 years (if income > € 70,000) • business losses can be offset against income from any other source

Country	CIT Loss Offset		PIT Loss Offset	
	Carry Back	Carry Forward	Carry Back	Carry Forward
Czech Republic	-	<ul style="list-style-type: none"> • limited to 5 years • loss trafficking rules apply if substantial change (> 25%) in ownership unless at least 80% of company's income is generated by same activities as the losses 		<ul style="list-style-type: none"> • limited to 5 years • business losses can be offset against rental income
Denmark	-	<ul style="list-style-type: none"> • unlimited • max. annual offset: 60% of taxable income if a company earns more than DKK 7,75 million capital losses on investments (other than investments in subsidiaries) and capital losses on immovable property can only be offset against gains from similar assets 	-	<ul style="list-style-type: none"> • unlimited • capital losses can only be offset against capital gains
Estonia	-	-	-	<ul style="list-style-type: none"> • carry forward of business losses limited to 7 years
Finland	-	<ul style="list-style-type: none"> • limited to 10 years • separate carry forward for "other income" • loss trafficking rules apply if majority of ownership transferred (> 50%) unless it is necessary for continuation of activities 	-	<ul style="list-style-type: none"> • limited to 10 years • no offset of losses classified as earned income against income from capital • capital losses can be offset against capital income and earned income (as a tax credit equal to 30% of the loss)
France	<ul style="list-style-type: none"> • limited to 1 year (with restrictions) • max. annual offset: € 1 million • tax credit available for following 5 years • refund available after 6 years 	<ul style="list-style-type: none"> • unlimited • max- annual offset: € 1 million plus 50% of profit beyond € 1 million • loss trafficking rules apply if business activities terminated, operations sold, company reorganized or company liquidated under court 	-	<ul style="list-style-type: none"> • limited to 5 years

Country	CIT Loss Offset		PIT Loss Offset	
	Carry Back	Carry Forward	Carry Back	Carry Forward
Germany	<ul style="list-style-type: none"> • limited to 1 year • max. annual offset: € 1 million 	<ul style="list-style-type: none"> • unlimited • max. annual offset: € 1 million plus 60% of net income beyond € 1 million • loss trafficking rules apply if ownership changes by 25% within 5 years (proportionate loss of carry forward) or 50% (complete loss of carry forward) 	<ul style="list-style-type: none"> • limited to 1 year • max. annual offset: € 1 million 	<ul style="list-style-type: none"> • unlimited • max. annual offset: € 1 million plus 60% of net income beyond € 1 million • capital losses (participation < 1%) can only be offset against capital gains
Greece	-	<ul style="list-style-type: none"> • limited to 5 years 	-	<ul style="list-style-type: none"> • limited to 5 years • unlimited for capital losses (but offset only against capital gains)
Hungary	-	<ul style="list-style-type: none"> • limited to 5 years • max. annual offset: 50% of taxable income 	-	<ul style="list-style-type: none"> • unlimited • max. annual offset: 50% of taxable income
Ireland	<ul style="list-style-type: none"> • limited to 1 year for continuing businesses • limited to 3 years for discontinuing businesses 	<ul style="list-style-type: none"> • unlimited • net capital losses cannot be offset against other profits • loss trafficking apply if ownership or nature of company change substantially 	<ul style="list-style-type: none"> • carry back only for losses from discontinuing business ventures (limited to 3 years) 	<ul style="list-style-type: none"> • unlimited • capital losses (no active involvement in trade) can only be offset against capital gains
Italy	-	<ul style="list-style-type: none"> • unlimited carry forward • max. annual offset: 80% of taxable income (limitation does not apply to losses accrued in the first 3 years of business) • loss trafficking rules apply if majority of ownership transferred or activity changes 	-	<ul style="list-style-type: none"> • no carry forward of losses from a small business (turnover < € 400.000 for services / € 700.000 for other sectors) but offset against other aggregate income of the tax year • limited to 5 years for losses from other businesses but offset only against other large business income • unlimited carry forward of business losses from first 3 years of operations

Country	CIT Loss Offset		PIT Loss Offset	
	Carry Back	Carry Forward	Carry Back	Carry Forward
Latvia	-	<ul style="list-style-type: none"> • unlimited • loss trafficking rules apply if control of company changes unless basic nature of the business does not change for 5 years 	-	<ul style="list-style-type: none"> • limited to 3 years
Lithuania	-	<ul style="list-style-type: none"> • unlimited • max. annual offset: 70% of taxable income (limitation does not apply to taxpayers eligible for small company relief) • capital losses cannot be offset against ordinary losses 	-	<ul style="list-style-type: none"> • unlimited if registered for VAT or applying accrual accounting
Luxembourg	-	<ul style="list-style-type: none"> • unlimited • loss trafficking rules apply for successor companies (e.g., after mergers) and "Mantelkäufe" 	-	<ul style="list-style-type: none"> • unlimited carry forward of business losses but offset only against business income
Malta	-	<ul style="list-style-type: none"> • unlimited • losses from depreciation can only be offset against the profits of the same and continuing trade • capital losses can only be offset against capital gains 	-	<ul style="list-style-type: none"> • unlimited • offset of business losses against other income categories • capital losses can only be off set against capital gains
Netherlands	<ul style="list-style-type: none"> • limited to 1 year 	<ul style="list-style-type: none"> • limited to 9 years • loss trafficking rules apply if ownership changes (unless qualified shareholding under the participation exemption is disposed) 	<ul style="list-style-type: none"> • limited to 3 years (business losses) or 1 year (capital losses) 	<ul style="list-style-type: none"> • limited to 9 years • offset of business losses only against income from box 1 (= all income not from shareholdings, investments and savings) • capital losses from qualified shareholdings (participation > 5%) are deductible from income from other sources in the same box and 25% of any excess is creditable against the tax due on income from box 1

Country	CIT Loss Offset		PIT Loss Offset	
	Carry Back	Carry Forward	Carry Back	Carry Forward
Poland	-	<ul style="list-style-type: none"> • limited to 5 years • max. annual offset: 50% of loss • loss trafficking rules apply for reorganizations (exceptions apply) 	-	<ul style="list-style-type: none"> • limited to 5 years • offset only against business income • max. annual offset: 50% of loss
Portugal		<ul style="list-style-type: none"> • carry forward limited to 12 years • max. annual offset: 70% of taxable income • loss trafficking rules apply if majority of voting rights change owner (exceptions apply) 	-	<ul style="list-style-type: none"> • limited to 12 years • offset only against business income • carry forward of capital losses limited to 5 years and offset only against capital gains
Romania		<ul style="list-style-type: none"> • limited to 7 years 	-	<ul style="list-style-type: none"> • limited to 5 years • offset only against business income • carry forward of losses from disposal of shares in listed companies limited to 7 years and offset only against income from same source (no carry forward or offset of losses from disposal of securities in unlisted companies)
Slovakia		<ul style="list-style-type: none"> • limited to 4 years 	-	<ul style="list-style-type: none"> • limited to 4 years • offset only against business income
Slovenia	-	<ul style="list-style-type: none"> • unlimited • max. annual offset: 50% of taxable income in any tax year • only 50% of capital losses deductible from positive income (except venture capital investments) • loss trafficking rules apply if ownership and essential business activities change (exceptions for successor companies) 	-	<ul style="list-style-type: none"> • unlimited • offset only against business income

Country	CIT Loss Offset		PIT Loss Offset	
	Carry Back	Carry Forward	Carry Back	Carry Forward
Spain	-	<ul style="list-style-type: none"> • unlimited • max. annual offset (2015): <ul style="list-style-type: none"> - 50% of taxable income if € 20 million < turnover < 60 million - 25% of taxable base if turnover > EUR 60 million 		<ul style="list-style-type: none"> • limited to 4 years • offset against income from other categories except for capital and savings income • capital losses can be offset against other capital income and other savings income
Sweden	<ul style="list-style-type: none"> • losses can be carried back through dissolution of tax allocation reserve 	<ul style="list-style-type: none"> • unlimited • capital losses on business-related holdings not deductible • loss trafficking rules apply if ownership changes 	<ul style="list-style-type: none"> • losses can be carried back through dissolution of tax allocation reserve 	<ul style="list-style-type: none"> • unlimited • offset only against business income from the same source (income from businesses abroad/ from partnerships/other business income) • business losses from the first 5 years of operation can be offset against business income from other sources and employment income up to SEK 100,000 annually • capital losses from quoted shares can only be offset against gains on quoted shares • capital losses from non-quoted shares can only be offset against gains on quoted and non-quoted shares • 70% of capital losses not offset against capital gains can be offset against other capital income • 30% of negative net capital income up to SEK 100,000 and 21% of the loss exceeding SEK 100,000 can be credited against the income tax due on earned income

Country	CIT Loss Offset		PIT Loss Offset	
	Carry Back	Carry Forward	Carry Back	Carry Forward
UK	<ul style="list-style-type: none"> limited to 1 year 	<ul style="list-style-type: none"> unlimited max. annual offset for banks: 50% of taxable income loss trafficking rules apply for 3 years if ownership and nature of the trade change 	<ul style="list-style-type: none"> limited to 1 year carry back of business losses from the last 12 months of discontinuing trade limited to 3 years carry back of early year's losses (4 years) carry back of discontinuing trades 	<ul style="list-style-type: none"> unlimited unlimited offset against business income and limited offset against other income (including capital gains) up to the higher of GBP 50,000 and 25% of total adjusted individual income
	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> 	<ul style="list-style-type: none">

Note: Data was retrieved from ibfd.org.

Annex 4: Taxpayer Bunching around Eligibility Thresholds for SME Tax Incentives (Supplemental Tables)

Table A3: Summary statistics of enterprises covered in AMADEUS (2014)

Country	Obs.	Number of enterprises	Turnover		Number of employees		Total assets	
			Mean	Median	Mean	Median	Mean	Median
Belgium	380,941	322,845	25,615.39	3,300.50	15.17	3.00	5,315.10	278.69
Hungary	413,671	313,603	216,668.91	11,044.00	9.55	2.00	247,670.29	7,024.00
Latvia	106,346	101,572	426.48	22.93	5.95	2.00	441.81	14.78
Lithuania	9,021	8,384	6,083.02	1,080.91	58.32	16.00	8,283.01	547.14
Romania	642,409	637,328	408.26	12.28	6.15	1.00	91.07	2.74
Spain	648,765	645,020	2,276.52	201.59	12.99	3.00	3,900.60	321.23

Table A4: Probit estimation of propensity score

	<i>BUNCH_5EMP</i>
<i>PROFIT_TURN</i>	0.052*** (0.012)
<i>EMPL_TURN</i>	-0.127*** (0.036)
<i>WRCP_TURN</i>	0.123*** (0.015)
<i>LN_TURNOVER</i>	0.103*** (0.005)
<i>LN_TOTALASSETS</i>	-0.123*** (0.003)
<i>GROWTH_TO_{t-1}</i>	-0.080*** (0.007)
<i>GROWTH_TO_{t-2}</i>	0.059*** (0.018)
<i>GROWTH_TA_{t-1}</i>	0.044*** (0.007)
<i>GROWTH_TA_{t-2}</i>	-0.018*** (0.004)
<i>GROWTH_EM_{t-1}</i>	0.228*** (0.011)
<i>GROWTH_EM_{t-2}</i>	0.029*** (0.004)
Constant	-1.258*** (0.040)
Pseudo R ²	0.031

Notes: *PROFIT_TURN*, *EMPL_TURN* and *WRCP_TURN* are financial ratios (profit before taxes over turnover, employment over turnover and working capital over turnover). *LN_TURNOVER* and *LN_TOTALASSETS* are the natural logarithms of turnover and total assets. *GROWTH_TO_{t-1}*, *GROWTH_TO_{t-2}*, *GROWTH_TA_{t-1}*, *GROWTH_TA_{t-2}*, *GROWTH_EM_{t-1}* and *GROWTH_EM_{t-2}* are the growth rates with regard to turnover, total assets and employment in the previous (two) year(s).

Annex 5: Distortion of Legal Form Choice (Supplemental Tables)

Table A5: Variable definitions and data sources

Variable	Definition	Source
<i>COMPLEX</i>	Dummy variable based on World Bank's measure of how long it takes a model corporation to file its tax returns and pay the due taxes. The dummy takes the value 1 if the required time exceeds the median time in the sample and 0 otherwise.	World Bank
<i>NONCORP</i>	Share of sole proprietorships in the population of enterprises. Variable is determined for each country and industry for each year.	Eurostat Business Demography (European Commission)
<i>GNIC</i>	Natural logarithm of the gross national income per capita in current U.S. dollar.	The World Bank
<i>LN_THRESHOLD</i>	Natural logarithm of the turnover threshold up to which non-corporate enterprises are eligible for simplified tax accounting in million euro. For all observations where no simplified accounting exists the threshold is set to one euro before taking the log.	International Bureau of Fiscal Documentation and national tax codes
<i>MINCAP</i>	Minimum capital of a corporation required by law in million euro.	International Bureau of Fiscal Documentation
<i>POST</i>	Dummy variable that takes the value 0 for years preceding the treatment in the respective difference-in-differences estimation and the value 1 for years following the treatment.	International Bureau of Fiscal Documentation and national tax codes
<i>POST_INCREASE</i>	Dummy variable that takes the value 0 if the eligibility threshold for simplified tax accounting in the respective country-industry cell has not been increased by at least 20% compared to the base year (2004) and the value 1 otherwise.	International Bureau of Fiscal Documentation and national tax codes
<i>TAX</i>	Tax rate differential (in decimals) of the personal income and the corporate income tax rate. For the personal income tax rate, the top marginal rate on business income is taken if progressive schedules apply. For the corporate income tax rate, applicable small business rates are taken if applicable. Dividend taxation is included. Social security contributions are neglected.	OECD, International Bureau of Fiscal Documentation
<i>THRESHOLD</i>	Turnover threshold up to which non-corporate enterprises are eligible for simplified tax accounting in million euro.	International Bureau of Fiscal Documentation and national tax codes
<i>THRESHOLD_INFL</i>	Turnover threshold up to which non-corporate enterprises are eligible for simplified tax accounting in million euro. Increased thresholds are adjusted by accumulated inflation rates since 2004.	International Bureau of Fiscal Documentation and national tax codes, World Bank
<i>TREAT</i>	Dummy variable that takes the value 1 if a country experiences a treatment (= an increase in the eligibility threshold for simplified tax accounting of at least 20%) during the sample period from 2004 to 2010 and 0 otherwise.	International Bureau of Fiscal Documentation and national tax codes
<i>UNEMP</i>	Unemployment rate in decimals.	The World Bank

Table A6: Refined measurement of the treatment effect (complete results)

	Eligibility threshold (1)	Inflation-adj. threshold (2)	Log threshold (3)	Tax complexity (4)
<i>THRESHOLD</i>	0.047*** (0.016)			
<i>THRESHOLD_INFL</i>		0.046** (0.018)		
<i>LN_THRESHOLD</i>			0.013** (0.005)	0.005 (0.006)
<i>LN_THRESHOLD#COMPLEX</i>				0.005*** (0.001)
<i>COMPLEX</i>				0.022* (0.013)
<i>TAX</i>	-0.061*** (0.024)	-0.062*** (0.024)	-0.071*** (0.024)	-0.081*** (0.028)
<i>MINCAP</i>	-0.024 (0.745)	-0.126 (0.756)	-0.225 (0.760)	-0.245 (0.749)
<i>UNEMP</i>	0.052 (0.077)	0.051 (0.077)	-0.000 (0.077)	0.183* (0.100)
<i>GNI</i>	-0.224*** (0.029)	-0.222*** (0.029)	-0.233*** (0.030)	-0.181*** (0.032)
Constant	2.756*** (0.305)	2.740*** (0.306)	2.946*** (0.317)	2.345*** (0.346)
Year FE	✓	✓	✓	✓
Country-Industry FE	✓	✓	✓	✓
Observations	7,030	7,030	7,030	5,807
R ² _{adj}	0.127	0.126	0.126	0.099

Notes: Dependent variable is the non-corporate firm share is the number of sole proprietorships divided by the number of all firms (excluding partnerships). All regressions control for country-industry fixed effects and a full set of year dummies. Additional controls include *TAX*, *GNIC*, *MINCAP* and *UNEMP*. Explanatory variables are defined as given in Table A5. Standard errors clustered at the country-industry level are given in parentheses; *, **, *** represent significance levels of 10%, 5%, and 1%, respectively.

Table A7: Marginal effects (GLM)

	GLM
<i>LN_THRESHOLD</i>	0.007** (0.003)
<i>TAX</i>	-0.086*** (0.027)
<i>MINCAP</i>	0.386 (0.829)
<i>UNEMP</i>	0.052 (0.096)
<i>GNIC</i>	-0.250*** (0.036)

Notes: Average marginal effects are given for the GLM regression presented in column (2) of Table 7. Variables are defined and scaled as given in Table A5. Standard errors are clustered at the country-industry level and given in parentheses; *, **, *** represent significance levels of 10%, 5%, and 1%, respectively.

Table A8: Industry classification

ID	NACE 1.1	NACE 2.0	Description
1	DA	C10-12	Manufacture of food products, beverages, and tobacco
2	DB	C13-14	Manufacture of textiles, wearing apparel, and other textile products
3	DC	C15	Manufacture of leather and leather products
4	DD	C16	Manufacture of wood, wood and cork products (except furniture), articles of straw, and plating materials
5	DE	C17-18, J58	Manufacture of pulp, paper, paper products; publishing and printing
6	DF	C19	Manufacture of coke, refined petroleum products, and nuclear fuel
7	DG	C20-21	Manufacture of chemicals, chemical products, man-made fibres, basic pharmaceutical products, and pharmaceutical preparations
8	DH	C22	Manufacture of rubber and plastic products
9	DI	C23	Manufacture of other non-metallic mineral products
10	DJ	C24-25	Manufacture of basic metals and fabricated metal products except machinery and equipment
11	DK	C28	Manufacture of machinery and equipment n.e.c.
12	DL	C26-27	Manufacture of electrical equipment, computer products, electronic products, and optical products
13	DM	C29-30	Manufacture of motor vehicles, trailers, semi-trailers, and other transport equipment
14	DN	C31-32	Manufacture of furniture and other manufacturing
15	-	C33	Repair and installation of machinery and equipment
16	E40	D	Electricity, gas steam, air conditioning, and hot water supply
17	E41, O90	E	Water supply, sewerage, waste management, and remediation activities
18	F	F	Construction
19	G50	G45	Wholesale trade, retail trade, and repair of motor vehicles and motorcycles
20	G51	G46	Wholesale trade and commission trade except of motor vehicles and motorcycles
21	G52	G47, S95	Retail trade, except of motor vehicles and motorcycles; repair of personal and household goods
22	H55.1-2	I55	Hotels, camping sites, and other provisions of short-stay accommodation
23	H55.3-5	I56	Food and beverage service activities
24	I60	H49	Land transport and transport via pipelines
25	I61	H50	Water transport
26	I62	H51	Air transport
27	I63	H52, N79	Warehousing and support activities for transportation; travel agency, tour operator, and other reservation service and related activities
28	I64	H53, J61	Postal and courier activities; telecommunications
29	K70	L	Real estate activities
30	K71	N77	Rental and leasing activities
31	K72	J62	Computer programming, consultancy, and related activities
32	K73	M72	Scientific research and development
33	K7411-2	M69	Legal, accounting, book-keeping, auditing activities; tax consultancy
34	K7414	M70	Activities of head offices and management consultancy activities
35	K742-3	M71	Architectural activities, engineering activities, related technical consultancy, technical testing, and technical analysis
36	K7413, K744	M73	Advertising, market research, and public opinion polling

ID	NACE 1.1	NACE 2.0	Description
37	K745	N78	Employment activities
38	K746	N80	Security and investigation service
39	K747	N81	Services to buildings and landscape activities
40	K748	M74, N82	Other professional, scientific, and technical activities; office administrative, office support, and other business support activities
41	M	P	Education
42	N	M75, Q	Human health, social work activities, and veterinary activities
43	O91	S94	Activities of membership organizations
44	O92	J59, J60, J63, R90-93	Recreational, cultural and sporting activities
45	O93	S96	Other personal service activities

Notes: ID is the identifier of the converged industries. NACE 1.1 is the industry codification used by the Eurostat Business Demography until 2007. NACE 2.0 is the industry codification used by the Eurostat Business Demography from 2008 onwards. The column description reports the activities covered by the converged classes.

Annex 6: Cost of Capital and EATRs for the EU Member States

Table A9: Development of the cost of capital of a domestic investment on the corporate level in the EU Member States (1999–2014)

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
AUT	6.3	6.3	6.7	6.7	6.7	6.7	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1
BEL	6.5	6.5	6.4	6.5	6.2	6.2	6.2	5.1	5.0	4.8	4.8	4.9	5.1	5.2	5.3	5.4
BUL	6.2	6.1	5.9	5.7	5.8	5.6	5.4	5.4	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3
CRO	4.2	4.2	5.8	5.8	5.7	5.8	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4
CYP	6.6	6.6	6.5	6.6	5.8	5.8	5.5	5.5	5.5	5.5	5.5	5.6	5.6	5.5	5.8	5.8
CZR	6.2	6.0	6.0	6.0	6.0	6.0	5.9	5.8	5.8	5.7	5.6	5.6	5.6	5.6	5.6	5.6
DEN	6.3	6.3	6.3	6.3	6.3	6.3	6.1	6.1	6.0	6.0	6.0	6.0	6.0	5.9	5.9	6.0
EST	5.8	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2
FIN	6.4	6.5	6.5	6.5	6.5	6.5	6.3	6.3	6.3	6.3	6.1	6.2	6.4	6.3	6.0	5.8
FRA	7.8	7.7	7.7	7.6	7.6	7.6	7.6	7.6	7.7	7.7	7.7	7.0	7.0	7.1	7.4	7.8
GER	7.7	7.7	7.1	7.1	7.2	7.1	7.1	7.0	7.0	6.5	6.4	6.4	6.5	6.5	6.5	6.5
GRE	6.3	6.3	6.3	6.3	6.3	6.3	6.1	6.0	5.8	5.8	6.3	5.8	5.6	5.6	6.2	6.2
HUN	6.2	6.2	6.2	6.2	6.2	6.1	5.8	5.8	5.9	5.9	5.9	5.9	6.0	6.0	6.0	6.0
IRE	5.4	5.4	5.4	5.6	5.7	5.7	5.7	5.8	5.8	5.8	5.8	5.8	5.8	5.8	5.8	5.8
ITA	5.5	5.3	5.4	6.6	6.5	6.4	6.4	6.4	6.4	6.3	6.3	6.3	5.6	5.6	5.6	5.4
LAT	6.1	6.1	6.1	5.9	5.8	5.7	5.7	5.7	5.7	5.6	5.6	5.1	5.2	5.2	5.2	5.7
LIT	5.4	5.3	5.3	5.3	5.3	5.3	5.3	5.4	5.4	5.3	5.5	5.3	5.3	5.3	5.6	5.6
LUX	6.4	6.4	6.4	6.1	6.1	6.1	6.1	6.0	6.0	6.0	6.0	6.0	5.9	5.9	6.0	6.0
MAL	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8
NED	6.9	6.9	6.6	6.6	6.6	6.6	6.4	6.3	6.1	6.1	5.8	5.8	5.8	6.0	5.8	6.0
POL	6.6	6.3	6.2	6.2	6.1	5.7	5.7	5.7	5.8	5.8	5.8	5.8	5.8	5.8	5.8	5.8
POR	6.7	6.6	6.6	6.4	6.4	6.1	6.1	6.1	6.0	6.0	6.0	6.2	6.2	6.3	6.3	6.3
ROM	6.9	6.0	6.0	6.1	6.0	6.0	5.6	5.6	5.7	5.7	5.7	5.7	5.7	5.7	5.7	5.7
SVK	7.2	6.1	6.1	5.9	5.8	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.8	5.7
SLV	5.6	5.6	5.6	5.6	5.7	5.7	5.9	5.9	6.0	5.9	5.9	5.8	5.8	5.7	5.7	5.7
ESP	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.5	7.5	7.5	7.5	7.3	7.5	7.7	7.6
SWE	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	5.8	5.8
UK	6.8	6.8	6.8	6.9	6.9	6.9	7.0	6.9	6.9	6.9	7.0	7.0	7.0	6.9	6.8	6.7
EU 28	6.3	6.2	6.2	6.3	6.2	6.2	6.1	6.0	6.0	6.0	6.0	5.9	5.9	5.9	5.9	6.0
EU 15	6.5	6.5	6.5	6.6	6.5	6.5	6.4	6.3	6.3	6.2	6.3	6.2	6.1	6.2	6.2	6.2
EU 13	6.1	5.9	6.0	5.9	5.9	5.8	5.7	5.7	5.7	5.7	5.7	5.6	5.6	5.6	5.7	5.7

Table A10: Development of the EATR of a domestic investment on the corporate level in the EU Member States (1999–2014)

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
AUT	29.7	29.7	31.2	31.0	31.0	31.2	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0
BEL	34.5	34.5	34.4	34.5	29.5	29.5	29.5	25.7	25.4	24.9	24.7	25.3	25.9	26.3	26.5	26.7
BUL	29.7	28.1	24.2	20.4	20.5	17.1	13.2	13.2	8.8	8.9	8.8	8.8	9.0	9.0	9.0	9.0
CRO	23.6	23.6	18.0	18.1	17.8	18.1	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5
CYP	27.5	27.5	26.5	26.9	14.8	14.8	10.6	10.6	10.6	10.6	10.6	11.6	11.6	11.9	15.2	15.2
CZR	25.4	23.6	23.6	23.6	23.6	24.6	22.7	21.0	21.0	18.4	17.5	16.7	16.7	16.7	16.7	16.7
DEN	28.3	28.3	26.8	26.8	26.8	26.8	25.1	25.1	22.5	22.6	22.6	22.6	22.6	22.0	22.0	22.2
EST	22.4	20.4	20.4	20.4	20.4	20.4	18.8	18.1	17.3	16.5	16.5	16.5	16.5	16.5	16.5	16.5
FIN	26.1	27.2	27.2	27.2	27.2	27.2	24.5	24.5	24.5	24.5	23.6	23.8	24.7	23.3	22.3	18.4
FRA	38.4	36.6	35.8	34.9	35.0	35.0	34.8	34.4	34.6	34.6	34.7	32.8	32.8	34.3	35.4	39.4
GER	40.4	40.4	35.8	35.8	37.0	35.8	35.8	35.5	35.5	28.2	28.0	28.0	28.2	28.2	28.2	28.2
GRE	30.4	30.4	30.4	30.4	30.4	30.4	27.8	25.2	21.7	21.8	30.5	21.0	17.5	17.5	24.1	24.1
HUN	19.3	19.7	19.7	19.7	19.7	17.8	16.6	16.3	19.5	19.5	19.5	19.1	19.3	19.3	19.3	19.3
IRE	9.4	9.4	9.4	12.3	14.3	14.3	14.3	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4
ITA	32.0	31.3	30.7	34.3	32.6	31.8	31.8	31.8	31.8	27.3	27.5	27.5	24.9	25.1	25.1	24.0
LAT	22.7	22.7	22.7	20.2	17.7	14.3	14.3	14.3	14.3	13.8	13.8	11.8	12.2	12.2	12.1	14.3
LIT	23.0	19.1	19.1	12.7	12.7	12.7	12.7	16.0	15.2	12.7	16.8	12.7	12.7	12.7	13.6	13.6
LUX	32.6	32.6	32.6	26.5	26.5	26.5	26.5	25.9	25.9	25.9	25.0	25.0	24.9	24.9	25.5	25.5
MAL	32.2	32.2	32.2	32.2	32.2	32.2	32.2	32.2	32.2	32.2	32.2	32.2	32.2	32.2	32.2	32.2
NED	32.3	32.3	31.5	31.0	31.0	31.0	28.4	26.7	23.1	23.1	22.2	22.2	21.8	22.6	21.6	22.6
POL	30.6	27.1	25.3	25.3	24.2	17.1	17.1	17.1	17.4	17.4	17.5	17.5	17.5	17.5	17.5	17.5
POR	33.4	31.5	31.5	29.5	29.4	24.6	24.6	24.6	23.7	23.7	23.7	24.8	24.8	27.1	27.1	27.1
ROM	34.4	22.7	22.7	22.9	22.7	22.4	14.7	14.7	14.8	14.8	14.8	14.8	14.8	14.8	14.8	14.8
SVK	36.7	25.8	25.8	22.3	21.9	16.5	16.8	16.8	16.8	16.8	16.8	16.8	16.8	16.8	20.3	19.4
SLV	20.9	20.9	20.9	20.9	21.5	21.5	22.1	22.3	20.9	20.0	19.1	18.2	18.2	16.4	15.5	15.5
ESP	36.5	36.5	36.5	36.5	36.5	36.5	36.5	36.5	34.5	32.8	32.8	32.8	31.9	32.4	33.7	32.6
SWE	23.8	23.8	23.1	23.1	23.1	23.1	24.6	24.6	24.6	24.6	23.2	23.2	23.2	23.2	19.4	19.4
UK	28.9	28.7	28.7	29.3	29.3	29.3	29.3	29.2	29.3	28.0	28.3	28.4	26.9	25.2	24.3	22.4
EU 28	28.3	26.9	26.3	25.7	24.9	24.0	22.6	22.2	21.6	21.1	21.4	20.7	20.5	20.5	20.9	20.8
EU 15	29.7	29.5	29.3	29.1	28.8	28.4	27.2	26.5	25.6	25.1	25.4	24.8	24.2	24.4	24.6	24.4
EU 13	26.8	24.1	23.2	22.0	20.7	19.2	17.6	17.6	17.3	16.8	17.0	16.4	16.5	16.3	16.9	17.0

Table A11: Development of the cost of capital of a domestic investment on the investor level in the EU Member States (1999–2014)

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
AUT	5.7	5.7	6.1	6.1	6.1	6.1	5.6	5.6	5.6	5.6	5.5	5.5	5.6	5.6	5.6	5.6
BEL	6.3	6.3	6.3	6.3	6.1	6.1	6.1	4.5	4.4	4.2	4.2	4.3	4.5	4.3	5.7	4.8
BUL	8.0	7.9	7.5	6.8	6.9	6.7	6.2	6.2	6.0	5.6	5.6	5.6	5.6	5.6	5.1	5.2
CRO	4.2	4.2	5.9	5.9	5.9	5.9	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.5	5.5	5.5
CYP	4.1	4.0	4.1	4.1	5.4	5.4	5.1	5.1	5.1	5.1	5.1	5.2	5.7	4.9	4.4	4.4
CZR	5.6	5.3	5.3	5.3	5.3	5.3	5.2	5.1	5.1	5.0	5.0	4.9	4.9	4.9	4.9	4.9
DEN	4.0	4.0	4.1	4.1	4.1	4.1	4.1	4.1	4.0	4.1	4.1	4.5	4.8	4.8	5.0	5.2
EST	6.6	5.9	5.9	5.9	5.9	5.9	5.8	5.8	5.8	5.7	5.7	5.7	5.7	5.7	5.7	5.7
FIN	5.0	5.1	5.1	5.1	5.1	5.1	5.9	5.7	5.7	5.7	5.5	5.5	5.7	5.5	5.3	5.2
FRA	5.5	5.5	5.5	5.4	5.4	5.3	5.3	5.2	5.3	5.2	5.1	4.4	4.4	5.5	4.8	5.4
GER	5.8	5.9	4.4	4.4	4.5	4.7	4.8	4.8	4.6	4.3	5.9	5.9	6.0	6.0	6.0	6.0
GRE	6.2	6.2	6.2	6.2	6.2	6.2	6.1	6.0	5.8	5.8	6.3	6.0	5.9	5.9	6.1	5.8
HUN	5.2	5.2	5.2	5.2	5.2	5.2	4.6	4.7	5.8	5.8	5.8	6.2	6.2	6.2	6.2	6.2
IRE	5.2	5.2	5.2	5.6	5.7	5.7	5.7	5.7	5.7	5.7	5.8	5.8	5.9	5.9	5.8	5.2
ITA	5.8	5.6	5.7	6.9	6.8	6.4	6.4	6.4	6.4	6.2	6.5	6.5	5.8	5.9	5.4	4.7
LAT	6.1	6.1	6.1	5.9	5.8	5.7	5.7	5.7	5.7	5.6	5.6	5.1	5.2	5.2	5.2	5.7
LIT	6.1	6.0	5.7	5.7	5.9	5.9	5.9	6.0	6.0	5.9	6.1	5.9	5.9	5.9	6.2	6.1
LUX	4.2	4.2	4.4	4.4	4.4	4.4	4.4	6.3	6.3	6.3	6.2	6.2	6.2	6.2	6.4	6.4
MAL	7.2	7.2	7.2	7.2	7.2	7.2	7.2	7.2	7.2	7.2	7.2	7.2	7.2	5.7	5.7	5.7
NED	3.6	3.6	6.7	6.6	6.6	6.6	6.4	6.3	6.1	6.1	5.9	5.9	5.8	6.0	5.8	6.1
POL	7.0	6.7	6.5	6.5	6.4	5.3	5.3	5.3	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4
POR	5.7	5.6	5.6	5.4	5.3	5.1	5.1	5.1	5.1	5.1	5.1	5.2	5.7	5.8	5.7	5.7
ROM	7.0	6.1	6.1	6.1	6.1	6.0	5.2	5.0	5.4	5.4	6.3	6.3	5.4	5.4	5.4	5.4
SVK	9.0	6.9	6.9	6.5	6.4	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.4	5.4
SLV	6.0	6.0	6.0	6.0	6.1	6.1	6.3	5.3	5.3	5.0	4.9	4.9	4.9	4.8	4.5	4.5
ESP	2.1	2.1	2.0	2.0	2.2	2.2	2.2	2.2	4.3	7.1	7.1	7.0	7.0	7.1	7.2	7.2
SWE	4.0	4.0	4.0	4.0	4.0	5.3	4.1	4.1	5.5	5.5	5.5	5.5	5.5	5.5	5.3	5.3
UK	4.9	4.9	4.9	5.0	5.0	5.0	5.0	5.0	5.0	5.1	5.2	4.9	4.9	4.8	5.1	5.0
EU 28	5.6	5.4	5.6	5.6	5.6	5.5	5.4	5.3	5.5	5.6	5.6	5.6	5.6	5.5	5.5	5.5
EU 15	4.9	4.9	5.1	5.2	5.2	5.3	5.2	5.2	5.4	5.6	5.6	5.5	5.6	5.6	5.7	5.5
EU 13	6.3	6.0	6.0	5.9	6.0	5.8	5.6	5.5	5.6	5.6	5.6	5.6	5.6	5.4	5.4	5.4

Table A12: Development of the EATR of a domestic investment on the investor level in the EU Member States (1999–2014)

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
AUT	39.4	39.4	40.4	40.3	40.3	40.4	34.3	34.3	34.3	34.3	34.1	34.1	34.3	34.3	34.3	34.3
BEL	44.2	44.2	44.2	44.2	40.5	40.5	40.5	36.2	35.9	35.6	35.4	35.9	36.3	35.5	39.5	36.9
BUL	42.1	40.9	37.4	32.7	32.9	30.0	21.1	21.1	17.2	13.7	13.6	13.6	13.8	13.8	11.2	11.7
CRO	23.6	23.6	27.1	27.2	26.9	27.2	16.5	16.5	16.5	16.5	16.5	19.0	16.5	25.2	25.2	25.2
CYP	30.2	30.6	29.5	29.8	22.0	22.0	18.4	18.4	18.4	18.4	18.4	19.3	21.6	21.9	21.4	19.3
CZR	35.6	28.4	28.4	28.4	28.4	29.5	27.9	26.4	26.4	24.1	23.4	22.6	22.6	22.6	22.6	22.6
DEN	41.5	41.5	42.5	42.5	42.5	42.5	41.5	41.5	39.9	41.4	41.4	40.6	41.5	41.5	41.9	42.3
EST	26.0	23.6	23.6	23.6	23.6	23.6	21.8	20.9	20.0	19.1	19.1	19.1	19.1	19.1	19.1	19.1
FIN	20.2	21.2	21.2	21.2	21.2	21.2	30.9	32.0	32.0	32.0	31.4	31.5	32.2	32.3	31.6	31.5
FRA	49.1	48.0	46.9	46.0	43.8	42.5	42.4	40.1	42.2	39.5	40.0	38.7	39.2	44.4	47.0	50.2
GER	49.4	48.3	38.9	38.9	39.8	38.6	38.4	38.2	38.5	32.5	38.9	38.9	39.1	39.1	39.1	39.1
GRE	40.3	40.3	39.6	39.0	39.0	39.0	28.0	25.4	21.9	22.0	30.6	33.0	34.9	34.9	38.5	29.5
HUN	26.7	27.0	27.0	27.0	27.0	25.7	26.6	26.8	32.8	32.8	32.8	34.0	28.8	28.8	28.8	28.8
IRE	38.8	37.3	36.2	38.3	39.5	39.5	39.5	39.5	39.5	38.8	42.9	42.9	45.6	45.5	45.3	43.9
ITA	39.2	39.1	38.2	41.9	41.6	39.8	39.4	39.4	39.4	35.7	38.5	38.5	37.1	37.3	35.9	33.7
LAT	22.7	22.7	22.7	20.2	17.7	14.3	14.3	14.3	14.3	13.8	13.8	18.0	18.3	18.3	18.2	20.2
LIT	40.3	37.6	36.3	31.8	24.3	24.3	24.3	27.1	26.4	24.3	30.7	27.5	27.5	27.5	28.2	25.1
LUX	36.3	36.3	35.9	30.4	30.4	30.5	30.4	36.1	36.1	36.1	35.4	35.4	36.4	36.2	37.3	37.3
MAL	33.5	33.5	33.5	33.5	33.5	33.5	33.5	33.5	33.5	33.5	33.5	33.5	33.5	28.0	28.0	28.0
NED	33.6	33.6	42.4	42.1	42.1	42.1	40.1	38.8	36.1	36.1	35.4	35.5	35.1	35.7	35.0	35.7
POL	40.7	37.9	33.9	33.9	33.0	26.7	26.7	26.7	26.9	26.9	26.9	27.0	26.9	27.0	27.0	27.0
POR	40.9	39.4	39.4	35.3	35.2	31.2	31.2	31.2	30.5	30.5	30.5	31.4	33.9	37.1	38.4	38.4
ROM	38.8	25.3	25.3	25.5	25.3	25.1	18.8	21.4	23.2	23.2	26.9	26.9	23.2	23.2	23.2	23.2
SVK	47.5	35.9	35.9	32.2	31.9	14.2	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	18.8	17.9
SLV	38.2	38.2	38.2	38.2	38.6	38.6	40.4	30.4	29.2	27.4	26.7	25.9	25.9	24.5	26.1	26.1
ESP	33.2	33.2	33.2	33.2	31.3	31.3	31.3	31.3	32.8	39.2	39.2	40.3	40.0	42.8	43.8	43.0
SWE	32.8	32.8	32.3	32.3	32.3	36.3	33.5	33.5	37.9	37.9	36.9	36.9	36.9	36.9	34.2	34.2
UK	34.5	34.4	34.4	34.7	34.7	34.7	34.8	34.7	34.7	34.0	34.2	39.4	38.4	37.3	34.3	33.0
EU 28	35.9	34.3	34.3	33.5	32.6	31.3	29.7	29.3	29.3	28.9	29.7	30.2	30.1	30.6	30.9	30.3
EU 15	37.4	37.2	37.6	37.2	36.7	36.5	35.6	35.3	35.2	35.2	36.1	36.7	37.3	38.0	38.4	37.4
EU 13	34.3	31.2	30.7	29.5	28.1	25.7	23.4	22.9	23.0	22.2	22.8	23.1	22.5	22.6	22.9	22.6

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