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How Does EU Cohesion Policy Work? Evaluating its Effects on Fiscal Outcome Variables

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Non-technical summary

The impact of the EU Cohesion Policy has mainly been evaluated by analysing its growth effects. However, this perspective neglects that the EU support might affect other policy fields as well.

There are at least two reasons why the impact on public investment should be of special interest. First of all, according to the principle of additionality the Member States have to co-finance EU-funded projects but must not crowd out spending for national public investments elsewhere. Second, since a major part of Cohesion Policy payments is spent on government investments, virtually all empirical studies on the investigation of the growth effects assume that the Cohesion Policy increases investments leading to a higher steady-state capital stock per capita, which, in turn, increases the GDP growth rate. Hence, an essential condition for the effectiveness of EU transfers is the degree to which they affect overall national public investments. However, the impact of Cohesion Policy payments on national public investments has not yet been evaluated.

Furthermore, instead of increasing future-orientated spending, EU Cohesion Policy payments may (indirectly) be used to reduce public deficits. This is possible if EU regional policy crowds out national spending, which is most likely to occur in poorer countries. To the best of our knowledge, there has been no paper investigating the effects on public deficits.

Against this background, the paper at hand examines through which channels this policy field works by analysing the impact of EU Cohesion Policy payments on national public investments and primary budget balances. In doing so, we use a comprehensive dataset of 27 EU countries, extend the time period of investigation to 1982-2006 and apply advanced panel econometric methods.

Our results indicate that EU Cohesion Policy payments do not significantly increase national public investments, thus pointing to a crowding out of national spending. Moreover, the hypothesis that EU funds are used for the consolidation of public budgets cannot be rejected in all econometric specifications.

Zusammenfassung

Bisher wurde die Kohäsionspolitik der Europäischen Union (EU) nahezu ausschließlich im Hinblick auf ihre Wachstumswirkungen untersucht. Diese Fokussierung vernachlässigt, dass die EU Kohäsionspolitik ebenfalls auf andere Politikfelder einwirken kann.

Es gibt mindestens zwei Gründe weshalb der Einfluss auf öffentliche Investitionen von besonderem Interesse ist. Erstens müssen die EU Mitgliedstaaten die von der EU geförderten Projekte kofinanzieren, wobei diese Förderung gemäß dem Additionalitätsprinzip die staatlichen Investitionen nicht verdrängen darf. Zweitens wird ein Großteil der Kohäsionspolitik im Bereich staatlicher Investitionen (wie bspw. Verkehrsinfrastruktur) ausgegeben. Daher basieren nahezu alle Studien, welche die Wachstumswirkungen der EU Kohäsionspolitik untersuchen, auf der Annahme, dass die Kohäsionspolitik die Investitionen erhöht, die wiederum im Steady State zu einem höheren Kapitalstock pro Kopf führen und somit die Wachstumsrate des BIP beeinflussen. Folglich ist eine notwendige Bedingung für die Wirksamkeit der EU Transfers, dass sie die gesamten öffentlichen Investitionen erhöhen. Jedoch wurde der Einfluss der EU Kohäsionspolitik auf die staatlichen Investitionen bisher nicht evaluiert.

Darüber hinaus könnte es sein, dass die EU Kohäsionspolitikzahlungen statt zur Erhöhung der Investitionen (indirekt) dazu verwendet werden, die öffentlichen Haushaltsdefizite zu verringern. Dies ist möglich, sofern die EU Kohäsionspolitik nationale Ausgaben verdrängt, was insbesondere im Falle ärmerer Mitgliedsstaaten (und den Zahlungen aus dem so genannten Kohäsionsfonds) denkbar ist. Unseres Wissens gibt es bisher keine Studie, welche die Wirkungen der Kohäsionspolitik auf die öffentlichen Haushalte untersucht.

Vor diesem Hintergrund ist es das Ziel dieser Studie, den Einfluss der Zahlungen der EU Kohäsionspolitik auf die öffentlichen Investitionen sowie die Haushaltsdefizite zu analysieren. Hierzu wird ein umfassender Datensatz von 27 EU Ländern verwendet, die Untersuchungsperiode auf den Zeitraum 1982-2006 ausgedehnt und panelökonometrische Methoden angewendet.

Unsere Ergebnisse zeigen, dass die EU Kohäsionspolitik die öffentlichen Investitionen nicht signifikant erhöht, was auf eine Verdrängung nationaler Ausgaben hindeutet. Darüber hinaus kann die Hypothese, dass die EU Förderung zur Konsolidierung der öffentlichen Haushalte verwendet wird, nicht in allen ökonometrischen Spezifikationen verworfen werden.

How Does EU Cohesion Policy Work? Evaluating its Effects on Fiscal Outcome Variables

Tobias Hagen* and Philipp Mohl**

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Abstract

The impact of EU Cohesion Policy has mainly been evaluated with regard to its growth effects. We extend the perspective by investigating the impact of EU Cohesion Policy on public investments and budget deficits in order to learn more about the channels through which this policy field works. Using a dataset of 27 EU countries for the time period 1982-2006, we find that EU Cohesion Policy payments do not cause public investments to increase significantly, which points to a crowding out of national investment. Moreover, the hypothesis that EU Cohesion Policy is used for the consolidation of public budgets cannot be completely rejected.

Keywords: EU Cohesion Policy, public investment, public deficits, panel data
JEL classification: C23, H54, H62

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1 Introduction

The debate on the impact of the EU Cohesion Policy (CP) has intensified over the last decade.[1] Many papers investigate if CP payments promote growth and convergence. Nevertheless, the results are not clear-cut: While some authors find evidence for a positive relation (Beugelsdijk and Eijffinger, 2005), others find no evidence (Dall'erba and Le Gallo, 2007) or even negative support for this (Eggert, von Ehrlich, Fenge and König, 2007). All in all, the discussion might be summarised by stating that the EU CP is only conditionally effective. Given the quality of the institutional setup (Ederveen, de Groot and Nahuis, 2006), decentralised governmental structures (Bähr, 2008) or depending on which Objective is analysed (Mohl and Hagen, 2008), the CP has a positive impact on growth (a literature survey can be found in Hagen and Mohl, 2010).[2]

The strong focus on growth neglects the fact that the EU Regional Policy might have an influence on other policy fields as well. There are at least two reasons why the impact on public investments might be of special interest. First of all, according to the principle of additionality the Member States have to co-finance EU funded projects but must not crowd out investment spending elsewhere (European Commission, 2007). Second, since a major part of the Cohesion Policy is spent on public investments (European Commission, 2004), virtually all empirical studies on the investigation of the growth effects assume that Cohesion Policy increases investments, leading to a higher steady-state capital per capita, which, in turn, increases the GDP

[1] The terms "EU Cohesion Policy" and "EU Regional Policy" can be used synonymously. Both mean the policy of the EU to co-finance national projects mostly carried out at the regional level by payments from the so-called "structural funds" (Ederveen, de Groot and Nahuis, 2006).

[2] Besides econometric studies evaluating Cohesion Policy directly, there is empirical evidence on the convergence of EU countries and regions (see Eckey and Türk (2006) for a survey). Most studies find a small convergence rate of all or some European regions. The effect of EU membership (again, without taking Cohesion Policy directly into account) is analysed by Cuaresma, Ritzberger-Grünwald and Silgoner (2008). They find EU membership to have a positive effect on long-term economic growth, which is relatively higher for poorer countries.

growth rate.[3] Hence, an essential condition for the effectiveness of EU transfers is the degree to which they affect overall public investments. However, the impact of Cohesion Policy payments on national public investments has not yet been evaluated. One paper empirically analyses the principle of additionality based on another approach. Using a cross-section of European regions, Ederveen, Gorter, de Mooij and Nahuis (2002) investigate the impact of being an Objective 1 region (that is, being eligible for the highest transfers) on national regional support. They find that, on average, one euro cohesion support crowds out 17 cents of national regional policy.

Furthermore, instead of increasing future-orientated spending, EU Cohesion Policy payments may (indirectly) be used to reduce public deficits. This is possible if EU funds crowd out national spending, which is most likely to occur in poorer countries. To the best of our knowledge, there has been no paper investigating the effects on public deficits.

Against this background, this paper analyses how the EU Cohesion Policy works by extending the current literature with regard to at least three aspects: First, we investigate the effects of EU Cohesion Policy on additional (fiscal) outcome variables, namely on public investment and public deficits. Second, we use a more comprehensive dataset comprising total EU Cohesion Policy payments. Third, we extend both the time period of investigation to the period 1982-2006 and the number of countries to an EU-27 sample. Our results show no significantly positive effects on national public investments and some weak evidence in favour of the hypothesis that the CP payments are used for public budget consolidation.

The paper is structured as follows. In section 2 we present the dataset used and discuss the main econometric approach. Section 3 presents the econometric specifications and the empirical results. Finally, section 4 concludes.

[3]CP payments may influence long-run growth in two more ways (Esposti and Bussoletti, 2008; Bouvet, 2005). First, it may increase the initial level or the growth of the total factor productivity (TFP). Second, it may affect the labour market, that is, the initial workforce growth rate, which, in turn, has an impact on the steady-state output level.

2 Database and econometric approach

We investigate our research question using an EU-27 annual country dataset consisting of total EU Cohesion Policy payments for the time period 1982-2006 (European Commission, 2008). This contains the different structural funds[4] as well as the Cohesion Fund and the Instrument for Structural Policies for Pre-accession (ISPA) for the accession countries. A detailed description of the institutional setup can be found, among others, in European Commission (2007).

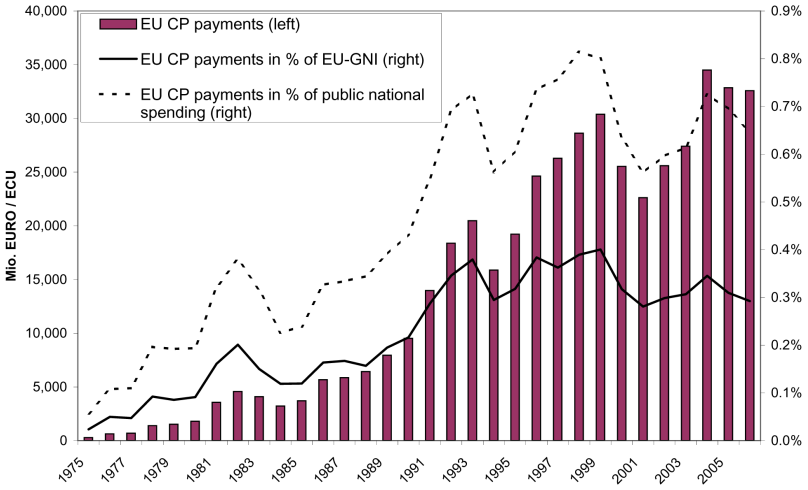
Figure 1 shows the historical development displaying the total nominal EU Cohesion Policy payments (vertical bars) and their shares relative to the EU-GNI (solid line) and to the public national spending (dotted line). It becomes clear that there is a long-term upward trend in payments when measured in absolute terms, which can be explained, inter alia, by the enlargement steps of the EU (Heinemann, Hagen, Mohl, Osterloh and Sellenthin, 2009). By contrast, payments measured in percent of EU-GNI and public national spending have almost consistently stagnated since 1993. Furthermore, Figure 1 shows that – on average – Cohesion payments do not seem to be very large compared to total public spending totalling approximately 0.65 percent in 2007.

Table 1 compares the expenditures for the EU Regional Policy with the national public investments and the primary surpluses. It becomes clear that Cohesion payments per GDP are quite important compared to total public investments in the so-called "old" (Spain, Greece, Ireland and Portugal) and the "new" (Eastern European Member States) cohesion countries. This indicates that it may indeed be hard for some countries to absorb the transfers and to co-finance European projects without cutting expenses elsewhere. Furthermore, it may be appealing for these countries in particular to reduce public deficits (increase primary surpluses) by displacing national funded projects by EU-funded projects.

Generally, we are keen on the estimation of "policy reaction" functions.

[4]These are the European Regional Development Fund (ERDF), the European Social Fund (ECP), the European Agricultural Guidance and Guarantee Fund (EAGGF) and the Financial Instrument for Fisheries Guidance (FIFG).

Figure 1: Development of total EU Cohesion Policy payments



Source: European Commission (2008).

Since the level of CP commitments is decided for several years in advance within so called "financial frameworks", national governments can anticipate and react instantaneously to the forthcoming EU support. As a consequence, we include the contemporaneous CP variable, i.e. not lagged, in the regression model.

In order to render the empirical results as robust as possible, we use different samples and methodological approaches. Regarding the choice of the countries, we use two different samples. First, the regressions are estimated for the whole time period for which data is available ("all time periods"). Thus, countries are included even before their accession. For example, Austria and Finland are included even before 1994 and the Eastern European countries before 2004. Since the latter countries also received EU support before their accession, it is (potentially) possible to distinguish between the "EU effect" and the "CP payments effect". Second, we only include the time periods in which the countries are members of the EU ("only EU members"). By definition, the second strategy reduces the number of observations significantly.

Concerning the econometric approaches, we start the estimation using a simple fixed effects estimator. We report standard errors to be robust to

serial and spatial correlation, following Driscoll and Kraay (1998).[5] The error structure is then assumed to be heteroskedastic, autocorrelated and possibly correlated between the countries (panels). Since these standard errors have not been very common in applied work yet, we also report – as a kind of robustness check – the White-Huber robust standard errors (White, 1980).

Due to the structure of our dataset (depending on the specification, N varies between 25 and 27, T varies between 2 and 27 with an average of 17.1), simply applying a fixed effects estimator in a dynamic setup leads to the well-known Nickell bias (Nickell, 1981). One way to control for this is to use the first-differenced GMM estimator proposed by Arellano and Bond (1991). Since this estimator has been found to have a large finite sample bias and poor precisions when the time series are persistent, we use, whenever possible, the two-step system GMM (SYS-GMM) estimator by Blundell and Bond (1998). In addition, using the SYS-GMM estimator has the advantage of taking into account potential endogeneity of further explanatory variables, i.e., there may be unobserved variables simultaneously affecting the independent and the dependent variables. The consistency of the SYS-GMM estimator is based on large N, which is obviously not given in our application. However, recent Monte Carlo simulations show that, given the predetermined variables in X, the SYS-GMM estimator has a lower bias and higher efficiency than the first-differenced GMM or the fixed effects estimator (Soto, 2006). The small N leads to a further problem: it is not possible to use the full set of instrumental variables since Windmeijer (2005) or Roodman (2009b) show that using too many instruments leads to biased results. For this reason, only recent values up to three lags are used. For a small panel size, Soto (2006) shows that not using all potentially available instruments does not decrease the reliability of the SYS-GMM estimator.

Furthermore, in order to mitigate the problem of too many instruments in the case of the SYS-GMM specification, we transform all our variables into deviations from time means, which is equivalent to the inclusion of time dummies. This decreases the total number of instruments and increases the degrees of freedom (Bond, Hoeffler and Temple, 2001). Instead of using all possible instruments for each available time period, we "collapse" the matrix

[5]The Stata command *xtscc* implemented by Hoechle (2007) is applied.

of instruments and only use the lags up to $t-2$ which leads to a smaller set of instruments. In addition, regarding the two-step SYS-GMM estimations, the standard errors are corrected following Windmeijer (2005).[6]

Another estimation strategy to deal with the Nickell bias is to apply the bias-corrected least square dummy variable (LSDVc) estimator proposed by Kiviet (1995) and extended by Bruno (2005a,b) to unbalanced panel data,[7] which turns out to have better properties in the case of small N (Bruno, 2005a; Judson and Owen, 1999). An obvious drawback of this estimator is the assumption of strict exogeneity of all explanatory variables (except for the lagged dependent variable). The standard errors of the LSDVc are bootstrapped (500 replications).

Due to our long time series, which comprises more than 20 years, our results might be affected by the problem of non-stationarity. Hence, we run Fisher type unit root tests for panel data following Maddala and Wu (1999).[8] The results reject the null hypothesis that the main variables of interest (CP payments per GDP, public investment per GDP and primary surplus per GDP) are non-stationary for all countries.

3 Empirical results

3.1 Effects on national public investments

We start our empirical analysis by investigating whether and to which extent EU Cohesion Policy payments lead to higher national public investments. Put differently, we evaluate if Cohesion payments are "additional", or if they only lead to a displacement of national public investments. In fact, the Member States' obligation to co-finance projects by the principle of ad-

[6]The Stata command *xtabond2* implemented by Roodman (2009a) is applied.

[7]The Stata command *xtlsdvc* implemented by Bruno (2005a) is applied. The SYS-GMM estimator (Blundell and Bond, 1998) is used to initialize the bias correction. The accuracy of the approximation is up to $O(1/NT^2)$.

[8]The Stata command *xtfisher* implemented by Scott Merryman is used. Results are available upon request.

ditionality[9] should ensure that an increase in European payments promotes domestically-financed investments, thus causing total national public investments to increase as well. Generally, the principle of additionality implies that EU funds can only be paid in addition to the Member States' investments and not instead of it. In practice, however, additionality is hard to control and, more importantly, it has not been sanctioned in the past. This leads to the suspicion that Cohesion payments displace at least some part of the domestic public investments.

The econometric analysis of national public investments ($pinv_{it}$) is based on a similar specification to the one by Mehrotra and Välilä (2006) for European countries. An obvious problem may arise from the fact that we do not observe all possibly relevant variables that determine the scale and timing of national public investments. For example, not only macroeconomic variables are relevant, but also unobserved variables such as government programmes and country specific peculiarities (e.g., natural disasters etc.). Since these variables may simultaneously affect CP payments, their omission may lead to biased estimates. In order to deal with this problem, we follow, inter alia, Nunziata (2005) by using a very flexible specification, where not only fixed country effects (μ_i) and fixed (annual) time effects (λ_t) are included, but also country-specific linear time trends (t_i). In this manner, we intend to control for unobserved fixed and time varying heterogeneity that affects all outcome variables apart from CP payments. Note that country-specific time trends are not possible for the SYS-GMM estimator since this would inflate the IV matrix. We estimate following model:

$$\begin{aligned} pinv_{it} = {} & \beta_0 + \alpha\, pinv_{it-1} + \beta_1\, d_{it-1} + \beta_2\, g_{it-1} + \beta_3\, gdppc_{it-1} + \beta_4\, EU_{it} \\ & + \beta_5\, cp_{it} + \beta_6\, contrib_{it} + \beta_7\, li_{it} + \beta_8\, open_{it-1} + \beta_9\, elect_{it} \\ & + \beta_{10}\, left_{it} + \gamma_i t_i + \mu_i + \lambda_t + \varepsilon_{it} \end{aligned} \tag{1}$$

The motivation for this specification is as follows. Since public debt (d_{it-1}) indicates the need for consolidating public finance, it should have a

[9] According to the principle of additionality, the EU transfers complement the contributions of the Member States rather than reducing them. Disregarding special exceptions, the Member States must maintain public spending at a level no less than that reached in the preceding period (European Commission, 2007).

negative impact on public investments. The growth rate of real GDP per capita (g_{it-1}) serves as a business cycle indicator.[10] The level of real GDP per capita ($gdppc_{it-1}$) controls for the hypothesis that demand for public investments may depend on the income level. Moreover, real GDP per capita is the most important allocation criteria for CP. The long-term interest rate (li_{it}) is a proxy for the opportunity costs of public investments, while $open_{it-1}$ (export plus imports per GDP) controls for the possibility that the demand for public investments may depend on the openness of the economy. In the case of the sample "all time periods" the dummy variable EU_{it} controls for possible membership effects.

Moreover, there is evidence that political economic variables might have an impact on the dependent variable (Persson and Tabellini, 2000; Tabellini and Alesina, 1990). Thus, we include two further control variables as a proxy for political effects: $elect_{it-1}$ measures the percentage share of pre-election months in each election year and $left_{it}$ gives the cabinet composition (Social Democratic and other left parties in percent of total cabinet posts).

Moreover, $contrib_{it}$ are total contributions from the national Member States to the EU (total revenues of the EU from so-called own resources) in percentage of GDP. This variable controls for the fact that payments to the EU may limit the fiscal scope of national governments. Furthermore, the national claims for payments from the EU may simply be determined by the Member States' considerations with regard to their net contribution to the EU budget (the difference between what the countries pay into the EU budget and what they receive from EU policies).[11] cp_{it} measures total CP payments to country i in percent of GDP. Eventually, the lagged dependent variable ($pinv_{it-1}$) controls for the path dependency of public investment. The description and the summary statistics of the variables used can be found in Table 2 and Table 3 in the Appendix.

The estimation results can be found in Table 4. As mentioned above, we

[10] On the one hand, it has a positive effect on public investments if the amount of public investments depends on tax revenues. On the other hand, the government may conduct an anti-cyclical policy, which leads to a negative effect.

[11] $contrib_{it}$ and cp_{it} are weakly positively correlated with a correlation coefficient of 0.14 (p-value 0.008) in our sample.

differentiate between two samples ("all time periods" and "only EU members"). Furthermore, various estimators are applied. Columns (1) and (5) contain static fixed effects estimators restricting to zero, where the displayed standard errors are either White-Huber robust or specified following Driscoll and Kraay (1998). Column (2) shows the results of fixed effects estimators applied to a dynamic specification. Since the latter strategy leads to the Nickell bias,[12] we also present the results of the bias-corrected dummy variable estimator (LSDVc) in columns (3) and (6). Finally, in columns (4) and (7) the results of the SYS-GMM specifications are shown, which allow for endogeneity of d_{it-1}, $gdppc_{it-1}$, $contrib_{it}$, and cp_{it} (besides $pinv_{it-1}$). As mentioned above, the SYS-GMM specification should be interpreted with caution, since N may be too small.

Table 4 shows that many of the estimated coefficients of the covariates have the expected signs. An increasing stock of public debt (d_{it-1}) (with the exception of the SYS-GMM specifications) leads to less public investments, which corresponds to the findings of Mehrotra and Välilä (2006). By contrast, the effect of a rise in the opportunity costs (real interest rates li_{it}) is less clear, suggesting that cost considerations seem to play only a minor role in government investment decisions. While GDP growth (g_{it-1}) affects public investments positively, indicating a pro-cyclical behaviour, the GDP level ($gdppc_{it-1}$) has (with one exception) a negative effect.[13] Moreover, we find significant robust results in all specifications for the lagged dependent variable and the public debt. The political variables also have the expected sign and the coefficient of $left_{it}$ is statistically significant, whereas election years do not have a significant impact. Contributions to the EU ($contrib_{it}$) do not seem to reduce public investments.

Generally, the results do not change significantly when standard errors are specified according to Driscoll and Kraay (1998). The disregard of the Nickell bias in column (2) leads, as expected, to an underestimation of the

[12]Since T varies between 3 and 31 with an average of 16.3, the bias may still be substantial (Judson and Owen, 1999).

[13]This result is in contrast to the one by Mehrotra and Välilä (2006). They interpret their result of a positive effect of the output level as evidence in favour of the hypothesis that public investments have characteristics of a luxury good.

lagged dependent variable. Moreover, the decrease of the sample size to the case of EU members only does not lead to different conclusions. Instead, the signs and the significance levels remain stable regardless of the choice of the specification.

The focus of our investigation lies on the Cohesion Policy variable. As Table 4 shows, all coefficients of cp_{it} are far from being significant. This is true for all econometric techniques and both samples. The estimated long-term effects of $\widehat{cp}_{it}$ $(\widehat{\beta}_5/(1-\widehat{\alpha}))$ are not shown since they are far from being significantly different from zero.

In order to validate our results we run further sensitivity analyses. First, one may argue that using country-specific time trends may lead to an "over-specification" in the sense of multicollinearity with other explanatory variables or the possibility that the variance of the dependent variable is "absorbed" to a large extent. For this reason, Table 5 in the Appendix shows the results when country-specific time trends are omitted. Note that the SYS-GMM models in the paper already omit the country-specific time trends so that these sensitivity analyses do not include SYS-GMM models. It can be seen that the basic results do not change.

Second, we exclude the political variables ($elect_{it}$,$left_{it}$) as well as the contributions to EU ($contrib_{it}$) in order to receive a more parsimonious estimation. The regression output displayed in Table 6 shows that this leaves our main finding untouched: cp_{it} is still not significant.

Third, the governments might not have complete knowledge on the future CP payments, e.g. due to problems in absorbing total structural funds. Thus, we re-run the regressions using lagged CP variables (cp_{it-1}), which does not change our key message (Table 7).

Fourth, in the SYS-GMM specifications we assumed that apart from the lagged dependent variable, only Cohesion Policy and the contributions to the EU are endogenous, which allows for a very parsimonious use of instruments. Nevertheless, the cp_{it-1} variable is still far from being significant.[14]

Finally, some empirical applications question the superiority of the SYS-GMM estimator mainly because the additional instruments might not be valid (Lucchetti, Papi and Zazzaro, 2001). As a consequence, we use the first-

[14]These results are not shown, but are available upon request.

differenced GMM estimator as an alternative estimator and again instrument d_{it-1}, $gdppc_{it-1}$, $contrib_{it}$ and cp_{it-1} (besides $pinv_{it-1}$), using a lag-limit and the collapse option. Again, the effect of cp_{it} is zero (Table 8).

Summarising the results, no statistically significant positive effect of EU Cohesion Policy on national public investments can be detected, irrespective of which sample and which method is used. As a consequence, it cannot be ruled out that CP simply serves as a substitute for domestically-financed investment projects.

3.2 Effects on national primary budget balances

After having found that, on average, EU Cohesion Policy does not have any measurable positive impact on public investments, we now analyse how Member States might make use of their increased financial scope. One possibility is that the resources are used for reducing public deficits.

In order to analyse this hypothesis, we use the primary budget balances as the dependent variable. The primary budget balance is the difference between non-interest spending and total revenues. It can be affected by the government much more rapidly than the total budget surplus, since it excludes interest payments, which are exogenous for the government in the short-run. Furthermore, by using this variable, a clear-cut theoretical foundation is available (Bohn, 1998).

One would expect the CP payments, ceteris paribus, to have a negative impact on primary surplus if countries co-finance projects by additional means without altering the structure of public spending (government consumption versus investment). By contrast, if national spending were cut, CP payments would have a positive impact. The mean primary balances as percent of GDP of the EU countries can be found in Table 1.

A framework for explaining public debt policy is formulated by Bohn (1998). This approach explains the primary budget balance as percent of GDP (bal_{it}) by the public debt stock (as percent of GDP) at the beginning of the period (d_{it-1}) as well as further variables in a time series context.[15]

[15]If the estimated coefficient of d_{it-1} is positive, i.e., there is a positive response of the primary surplus to the debt-GDP ratio. As shown by Bohn (1998), this implies that

In the following, this concept is applied to our panel of countries and the research goal at hand:

$$\begin{aligned} bal_{it} = {} & \beta_0 + \alpha\, bal_{it-1} + \beta_1\, d_{it-1} + \beta_2\, g_{it-1} + \beta_3\, gdppc_{it-1} + \beta_4\, EU_{it} \\ & + \beta_5\, cp_{it} + \beta_6\, contrib_{it} + \beta_7\, li_{it} + \beta_8\, open_{it-1} + \beta_9\, elect_{it} \\ & + \beta_{10}\, left_{it} + \gamma_i t_i + \mu_i + \lambda_t + \varepsilon_{it} \end{aligned} \tag{2}$$

In fact, this specification is rather similar to the one applied to the public investment decision above. Again, it is controlled for country-specific linear time trends (t_i). A description of the variables used can be found in Table 4 in the Appendix. The long-term interest rate (it_{it}) is a proxy for the opportunity costs of public debt, whereas $open_{it-1}$ (export plus imports per GDP) controls for the possibility that the governments of more open economies choose a more restrictive fiscal policy. Again, it is controlled for the income level and GDP growth ($gdppc_{it-1}$,g_{it-1}). Higher contributions to the EU ($contrib_{it}$) may imply higher budget deficits. With regard to political considerations, the variables $elect_{it}$ and $left_{it}$ are included once again.

The estimation results are shown in Table 9. Again, different samples and various econometric techniques are applied. Columns (1) and (5) show the results of static fixed effects models assuming strict exogeneity of all regressors. Furthermore, ignoring the "Nickell bias", column (2) includes the results of a dynamic fixed effects specification. Columns (3) and (6) display the results of the LSDVc (see last subsection). In columns (4) and (7), SYS-GMM models additionally allow for endogeneity of d_{it-1}, g_{it-1}, $gdppc_{it-1}$, $contrib_{it}$ and cp_{it}, whilst omitting country-specific time trends (t_i).

First we take a look at the control variables. The coefficient of d_{it-1} has the expected positive sign which is not statistically significant from zero in the case of the SYS-GMM only. Hence, on average, high public debt brings (or forces) governments to generate higher primary surpluses. In some specifications, the same holds true for the long-term interest rate (li_{it}). Economic growth (g_{it-1}) helps to increase the primary surplus. Ultimately, election years ($elect_{it}$) are associated with reduced budget surpluses, which is well

the fiscal policy is sustainable in that it satisfies an intertemporal budget constraint. However, since the estimated coefficient here is an (unweighted) average of N different countries, it is not relevant to this issue.

documented in the literature (see, for example Shi and Svensson, 2003, for an overview). The effect of the contributions to the EU (EU_{it}) is not clear-cut.

With regard to the estimated coefficients of cp_{it}, it can be seen that CP payments have a significantly positive impact on primary surpluses in the case of fixed effects specifications. However, the significances vanish using the LSDVc and the SYS-GMM. Nevertheless, the hypothesis that countries use the CP payments to indirectly reduce their deficits cannot be rejected, since we would otherwise have expected to find a negative effect.

Again we run several robustness regressions (without county-specific time trends, without contribution payments to the EU and political variables, lagged CP instead of contemporaneous CP, one-step FD-GMM instead of two-step SYS-GMM). The results can be found in Appendix (Tables 10 – 13). Again, the results hardly change: No significantly negative impact of CP payments can be detected.

4 Conclusion

The previous studies analysing the impact of EU Cohesion Policy have mainly focused on the investigation of its economic growth effects and have mainly led to inconclusive results. In this paper we broaden this perspective in attempting to analyse through which fiscal channels the EU Cohesion Policy works or does not work. We investigate the impact of Cohesion Policy payments on public investment and on primary budget balances by estimating policy reaction functions. In doing so, we use more appropriate data within a greater time span, applying advanced panel data methods.

Our results show that EU Cohesion Policy payments do not seem to increase public investments in the EU countries, indicating a crowding out process of national spending. Furthermore, the hypothesis that EU funds are used for the consolidation of public budgets cannot be rejected in all econometric specifications.

Our findings have at least two implications. First, they might explain the mixed results of previous growth studies on Cohesion Policy, which are almost exclusively based on the assumption that EU Regional Policy increases

investments, which – at least at the national level – seems not to be the case. Second, the policy conclusions are that the principle of additionality (stating that domestically funded projects must not be displaced by EU projects) should be monitored and sanctioned more carefully in order to ensure that Cohesion Policy payments lead to higher public investments.

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Appendix

Table 1: EU Cohesion Policy payments, national public investments and primary budgets as percent of GDP

	EU CP payments (as % of GDP)	**Public investments** (as % of GDP)	**Primary balance** (as % of GDP)	**Time period from ... until 2007**
	(1)	(2)	(3)	(4)
Austria	0.13	1.59	1.17	1995
Belgium	0.10	2.12	3.38	1982
Bulgaria	1.00	3.62	3.40	2000
Czech Republic	0.07	3.26	0.76	2000
Cyprus	0.34	4.39	-3.10	2002
Denmark	0.08	1.84	5.03	1982
Estonia	0.93	4.13	1.61	2000
Finland	0.21	2.71	4.60	1995
France	0.13	3.21	-0.33	1982
Germany	0.12	2.16	0.78	1982
Greece	1.53	3.00	0.57	1982
Hungary	0.54	3.85	-2.19	2000
Ireland	1.34	3.12	3.25	1982
Italy	0.24	2.69	0.96	1982
Latvia	1.69	2.87	-0.59	2000
Lithuania	1.09	3.34	-0.58	2000
Luxembourg	0.09	4.17	2.58	1990
Malta	0.25	4.31	-1.00	2002
Netherlands	0.06	3.28	2.00	1982
Poland	0.58	3.41	-1.55	2000
Portugal	2.19	3.45	0.31	1986
Romania	0.59	3.52	-0.35	2000
Slovak Republic	0.59	2.53	-2.46	2000
Slovenia	0.27	3.37	-0.39	2000
Spain	0.84	3.76	1.85	1986
Sweden	0.10	3.13	3.67	1995
UK	0.15	1.83	0.83	1982

Notes: Own calculations based on European Commission (2008). We restrict the statistics to the years in which positive CP payments are observable; the earliest year is 1982.

Table 2: Definition of the variables

Variable	Definition	Source
pinv	Gross fixed capital formation of the general government (as % of GDP)	AMECO
bal	General government primary balance (as % of GDP)	OECD
d	General government gross financial liability (as % of GDP)	WEO
li	Real long-term interest rate in percent	AMECO
open	Openness of the economy (imports plus exports as % of GDP)	WEO
g	Growth of real GDP per capita	WDI
gdppc/1,000	Level of real GDP per capita in Dollar in PPP	WDI
elect	Share of pre-election months in each year	Armingeon et al. (2008)
left	Cabinet composition: Social-Democratic and other left parties as % of total cabinet posts, weighted by days	Armingeon et al. (2008)
EU	Dummy for membership in the EU	
cp	Total EU Cohesion Policy payments (as % of nominal GDP)	European Commission (2008) and WDI
contrib	National payments to the EU (revenues of the EU from so-called own resources) (as % of nominal GDP)	European Commission (2008) and WDI

Notes: WDI = World Development Indicators (Worldbank); WEO = World Economic Outlook (IMF); AMECO = Annual Macro-Economic Database of the European Commission, DG ECFIN; OECD = OECD Economic Outlook Database; Armingeon et al. (2008) = Armingeon, Gerber, Leimgruber and Beyeler (2008).

Table 3: Descriptive statistics for the estimation sample

Variable	Number of obs.	Mean	Std. dev.	Min.	Max.
pinv	439	2.99	0.88	0.67	5.13
bal	406	1.34	2.96	-8.17	11.62
d	439	56.54	28.55	4.06	134.16
li	439	7.82	3.84	3.30	27.53
open	439	91.34	52.24	35.89	347.18
g	439	2.60	2.50	-6.75	12.31
gdppc/1,000	439	23.70	10.86	0.43	112.81
elect	439	0.15	0.28	0.00	1.00
left	439	39.87	37.00	0.00	100.00
EU	439	0.79	0.41	0.00	1.00
contrib	439	7.36	4.19	0.00	15.12
cp	439	0.47	0.69	0.00	3.50

Table 4: Determinants of national public investments

	All time periods				**Only EU members**		
	FE stat.	**FE dyn.**	**LSDVc**	**SYS-GMM**	**FE stat.**	**LSDVc**	**SYS-GMM**
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
$pinv_{it-1}$		0.461	0.622	0.639		0.639	0.63
		(7.11)	(13.86)	(4.49)		(10.54)	(4.06)
		[4.86]					
d_{it-1}	-0.038	-0.02	-0.015	-0.012	-0.041	-0.017	-0.016
	(-10.24)	(-5.95)	(-4.67)	(-2.25)	(-10.90)	(-3.90)	(-1.97)
	[-11.77]	[-5.86]			[-11.18]		
li_{it}	-0.02	-0.019	-0.021	0.025	-0.01	-0.011	0.029
	(-1.42)	(-1.63)	(-0.97)	(-1.28)	(-0.57)	(-0.37)	(-1.46)
	[-0.98]	[-1.34]			[-0.38]		
$open_{it-1}$	0.005	0.002	0.002	0.002	0.004	0.001	0.001
	(1.19)	(0.57)	(0.64)	(0.75)	(0.89)	(0.25)	(0.34)
	[1.18]	[0.76]			[0.83]		
g_{it-1}	0.017	0.02	0.021	0.004	0.002	0.012	0.011
	(1.40)	(1.76)	(1.52)	(0.31)	(0.14)	(0.53)	(0.58)
	[1.78]	[2.11]			[0.15]		
$gdppc_{it-1}/1,000$	-0.019	-0.011	-0.009	0.005	-0.016	-0.004	-0.003
	(-2.64)	(-1.78)	(-0.50)	(0.53)	(-1.97)	(-0.18)	(-0.58)
	[-2.62]	[-1.90]					
cp_{it}	**-0.133**	**-0.035**	**-0.029**	**0.026**	**-0.063**	**0.032**	**-0.003**
	(-1.49)	**(-0.52)**	**(-0.38)**	**(0.14)**	**(-0.63)**	**(0.34)**	**(-0.01)**
	[-1.60]	**[-0.68]**					
$contrib_{it}$	0.013	0.014	0.017	0.005	0.042	0.034	0.071
	(0.69)	(0.87)	(0.86)	(1.02)	(1.98)	(1.60)	(1.61)
	[0.43]	[0.66]					
$elect_{it}$	0.029	0.062	0.073	0.069	-0.011	0.027	0.032
	(0.45)	(1.24)	(1.27)	(1.33)	(-0.16)	(0.34)	(0.74)
	[0.50]	[1.35]					
$left_{it}$	0.002	0.001	0.001	0.002	0.003	0.001	0.002
	(3.05)	(2.35)	(1.27)	(1.23)	(3.48)	(1.78)	(1.25)
	[3.04]	[2.48]					
EU_{it}	0.234	-0.069	-0.135	-0.313			
	(-0.69)	(-0.37)	(-0.68)	(-0.60)			
	[0.90]	[-0.43]					
Time dummies	yes	yes	yes	yes	yes	yes	yes
(p-value)	0.000	0.000	0.000	(time demean)	0.000	0.000	(time demean)
Time trend	specific	specific	specific	no	specific	specific	no
(p-value)	0.000	0.000	0.000		0.000	0.000	
No. instrum.				40			39
Hansen (p-value)				0.988			0.946
AR(2) test (p-value)				0.296			0.43
R2 (within)	0.692	0.761			0.678		
No. of countries	27	27	27	27	25	25	25
No. of obs.	439	436	436	408	347	347	320

Notes: t-values in parentheses if not stated otherwise: FE: (White-Huber robust s.e.) / [Driscoll-Kraay s.e.]; LSDVc: 500 bootstrap replications.

Table 5: Determinants of national public investments (*without country-specific time trend*)

	All time periods			**Only EU members**	
	FE stat.	**FE dyn.**	**LSDVc**	**FE stat.**	**LSDVc**
	(1)	(2)	(3)	(4)	(5)
$pinv_{it-1}$		0.685	0.782		0.757
		(16.4)	(21.27)		(16.16)
		[14.38]			
d_{it-1}	-0.017	-0.008	-0.007	-0.018	-0.008
	(-6.88)	(-4.24)	(-3.55)	(-7.17)	(-3.40)
	[-5.63]	[-4.92]		[-5.49]	
li_{it}	-0.046	-0.019	-0.018	-0.014	-0.005
	(-3.62)	(-2.20)	(-1.39)	(-0.88)	(-0.30)
	[-3.20]	[-2.45]		[-0.55]	
$open_{it-1}$	0.007	0.002	0.002	0.005	0.001
	(2.66)	(1.01)	(1.25)	(2.02)	(0.79)
	[2.09]	[1.30]		[1.45]	
g_{it-1}	0.014	0.024	0.026	0.001	0.022
	(0.94)	(2.14)	(2.03)	(0.04)	(1.36)
	[1.23]	[2.94]		[0.05]	
$gdppc_{it-1}/1,000$	-0.029	-0.007	0.022	-0.031	-0.006
	(-7.86)	(-2.06)	(0.3)	(-8.62)	(-0.98)
	[-7.56]	[-2.16]		[-8.42]	
cp_{it}	**-0.007**	**0.042**	**0.021**	**-0.202**	**-0.024**
	(-0.08)	**(0.73)**	**(0.3)**	**(-1.90)**	**(-0.29)**
	[-0.07]	**[1.48]**		**[-1.64]**	
$contrib_{it}$	0.062	0.033	0.032	0.094	0.043
	(2.6)	(1.97)	(1.84)	(4.2)	(1.48)
	[1.93]	[1.85]		[2.68]	
$elect_{it}$	0.103	0.111	0.113	0.069	0.051
	(1.04)	(2.02)	(1.98)	(0.73)	(0.59)
	[1.40]	[2.19]		[0.92]	
$left_{it}$	0.002	0.001	0.001	0.001	0.001
	(2.26)	(1.89)	(1.19)	(0.19)	(0.59)
	[1.91]	[1.65]		[0.12]	
EU_{it}	-0.471	-0.329	-0.315		
	(-2.11)	(-2.17)	(-1.88)		
		[-2.64]			
Time dummies	yes	yes	yes	yes	yes
(p-value)	0.000	0.000	0.000	0.000	0.000
Time trend	no	no	no	no	no
R2 (within)	0.372	0.703		0.416	
No. of countries	27	27	27	25	25
No. of obs.	439	436	436	347	331

Notes: t-values in parentheses if not stated otherwise: FE: (White-Huber robust s.e.) / [Driscoll-Kraay s.e.]; LSDVc: 500 bootstrap replications.

Table 6: Determinants of national public investments (*without contributions to the EU and political variables*)

	All time periods				**Only EU members**		
	FE stat.	**FE dyn.**	**LSDVc**	**SYS-GMM**	**FE stat.**	**LSDVc**	**SYS-GMM**
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
$pinv_{it-1}$		0.512	0.678	0.77		0.691	0.723
		(5.69)	(15.54)	(8.42)		(11.68)	(6.62)
		[6.02]					
d_{it-1}	-0.034	-0.016	-0.011	-0.01	-0.038	-0.012	-0.012
	(-4.09)	(-4.57)	(-3.50)	(-2.89)	(-4.72)	(-3.14)	(-2.49)
	[-10.57]	[-5.26]			[-11.27]		
li_{it}	-0.02	-0.017	-0.018	0.007	-0.023	-0.016	0.017
	(-0.73)	(-1.30)	(-3.50)	(0.68)	(-0.54)	(-0.52)	(0.98)
	[-0.87]	[-1.25]			[-0.80]		
$open_{it-1}$	-0.001	-0.002	-0.002	-0.001	-0.002	-0.003	-0.001
	(-0.23)	(-0.65)	(-0.73)	(-0.18)	(-0.49)	(-0.88)	(-0.11)
	[-0.16]	[-0.49]			[-0.37]		
g_{it-1}	0.022	0.024	0.026	0.017	0.008	0.016	0.014
	(1.26)	(2.58)	(1.96)	(1.79)	(0.28)	(0.93)	(0.92)
	[2.32]	[2.71]			[0.49]		
$gdppc_{it-1}/1,000$	-0.022	-0.012	-0.009	0.007	-0.023	-0.006	0.009
	(-2.19)	(-2.65)	(-0.58)	(0.97)	(-1.56)	(-0.32)	(1.19)
	[-2.73]	[-2.05]			[-2.22]		
cp_{it}	**-0.134**	**-0.047**	**-0.037**	**0.01**	**-0.079**	**0.022**	**-0.074**
	(-0.59)	**(-0.38)**	**(-0.48)**	**(0.08)**	**(-0.30)**	**(0.26)**	**(-0.48)**
	[-1.36]	**[-0.84]**			**[-0.67]**		
EU_{it}	0.367	0.063	0.015	0.029			
	(1.18)	(0.44)	(0.12)	(0.52)			
	[1.93]	[0.67]					
Time dummies	yes	yes	yes	yes	yes	yes	yes
(p-value)	0.000	0.000	0.000	(time demean)	0.000	-0.798	(time demean)
Time trend	specific	specific	specific	no	specific	specific	no
(p-value)	0.000	0.000	0.000		0.000	-0.955	
No. instrum.				33			32
Hansen (p-value)				0.777			0.923
AR(2) test (p-value)				0.27			0.999
R2 (within)	0.689	0.779			0.647		
No. of countries	27	27	27	27	27	25	27
No. of obs.	466	463	463	435	374	356	362

Notes: t-values in parentheses if not stated otherwise: FE: (White-Huber robust s.e.) / [Driscoll-Kraay s.e.]; LSDVc: 500 bootstrap replications.

Table 7: Determinants of national public investments (*lagged CF variable*)

	All time periods				**Only EU members**		
	FE stat.	**FE dyn.**	**LSDVc**	**SYS-GMM**	**FE stat.**	**LSDVc**	**SYS-GMM**
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
$pinv_{it-1}$		0.462	0.624	0.792		0.636	0.518
		(7.11)	(13.85)	(5.13)		(10.49)	(3.48)
		[4.91]					
d_{it-1}	-0.038	-0.02	-0.015	-0.005	-0.041	-0.017	-0.015
	(-10.42)	(-5.92)	(-4.59)	(-0.53)	(-11.01)	(.3.91)	(-3.34)
	[-11.54]	[-5.83]			[-11.11]		
li_{it}	-0.022	-0.019	-0.02	0.011	-0.013	-0.012	0.031
	(-1.53)	(-1.66)	(-0.96)	(0.46)	(0.729	(-0.38)	(1.01)
	[-1.05]	[-1.33]			[-0.47]		
$open_{it-1}$	0.005	0.002	0.002	0.002	0.005	0.001	0.001
	(1.29)	(0.6)	(0.64)	(0.39)	(0.98)	(0.23)	(0.37)
	[1.26]	[0.77]			[0.90]		
g_{it-1}	0.016	0.020	0.021	-0.01	0.002	0.011	0.001
	(1.28)	(1.72)	(1.52)	(-0.40)	(0.1)	(0.6)	(0.05)
	[1.77]	[2.07]			[0.12]		
$gdppc_{it-1}/1,000$	-0.018	-0.011	-0.009	0.036	-0.017	-0.005	0.003
	(-2.59)	(-1.68)	(-0.47)	(1.15)	(-2.08)	(-0.23)	(0.25)
	[-2.59]	[-1.92]			[-1.71]		
cp_{it}	**-0.122**	**-0.026**	**-0.019**	**-0.281**	**-0.087**	**0.112**	**-0.252**
	(-1.36)	**(-0.38)**	**(-0.22)**	**(-0.94)**	**(-0.90)**	**(0.12)**	**(-0.94)**
	[-1.30]	**[-0.45]**			**[-0.85]**		
$contrib_{it}$	0.015	0.015	0.017	0.087	0.046	0.035	0.116
	(0.83)	(0.88)	(0.87)	(1.48)	(2.14)	(1.68)	(2.2)
	[0.56]	[0.70]			[1.51]		
$elect_{it}$	0.03	0.062	0.074	0.122	-0.013	0.028	0.026
	(0.48)	(1.24)	(1.26)	(2.32)	(-0.20)	(0.36)	(0.49)
	[0.52]	[1.34]			[-0.21]		
$left_{it}$	0.002	0.001	0.001	0.001	0.003	0.001	0.002
	(3.32)	(2.45)	(1.43)	(0.67)	(3.7)	(1.75)	(2.34)
	[3.18]	[2.62]			[3.11]		
EU_{it}	0.194	-0.077	-0.141	-0.555			
	(0.93)	(-0.42)	(-0.70)	(-1.48)			
	[0.79]						
Time dummies	yes	yes	yes	yes	yes	yes	yes
(p-value)	0.000	0.000	0.000	(time demean)	0.000	0.000	(time demean)
Time trend	specific	specific	specific	no	specific	specific	no
(p-value)	0.000	0.000	0.000		0.000	0.000	
No. instrum.				34			33
Hansen (p-value)				0.919			0.55
AR(2) test (p-value)				0.382			0.619
R2 (within)	0.691	0.762			0.679		
No. of countries	27	27	27	26	25	25	25
No. of obs.	439	436	436	408	347	331	294

Notes: t-values in parentheses if not stated otherwise: FE: (White-Huber robust s.e.) / [Driscoll-Kraay s.e.]; LSDVc: 500 bootstrap replications.

Table 8: Determinants of national public investments (*one-step first-differenced GMM instead of SYS-GMM*)

	All time periods	**Only EU members**
	(1)	(2)
$pinv_{it}$	0.778	0.49
	(5.26)	(3.21)
d_{it}	-0.004	-0.014
	(-0.52)	(-3.32)
li_{it}	0.019	0.032
	(0.87)	(1.10)
$open_{it}$	0.002	0.001
	(0.32)	(0.21)
g_{it}	-0.010	-0.002
	(-0.40)	(-0.07)
$gdppc_{it}/1,000$	0.037	0.001
	(1.07)	(0.06)
cp_{it}	**-0.473**	**-0.321**
	(-1.29)	**(-0.90)**
$contrib_{it}$	0.098	0.104
	(2.02)	(2.07)
$elect_{it}$	0.109	0.024
	(2.20)	(0.47)
$left_{it}$	0.000	0.002
	(0.31)	(2.33)
EU_{it}	-0.571	
	(-1.89)	
Time dummies	yes	yes
(p-value)	(time demean)	(time demean)
Time trend	no	no
No. instrum.	34	33
Hansen (p-value)	0.998	0.576
AR(2) test (p-value)	0.399	0.509
No. of countries	26	25
No. of obs.	381	294

Notes: t-values in parentheses if not stated otherwise.

Table 9: Determinants of primary budget balances

	All time periods				**Only EU members**		
	FE stat.	**FE dyn.**	**LSDVc**	**SYS-GMM**	**FE stat.**	**LSDVc**	**SYS-GMM**
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
bal_{it-1}		0.561	0.725	0.765		0.754	0.729
		(11.01)	(15.33)	(9.13)		(12.84)	(6.09)
		[7.14]					
d_{it-1}	0.088	0.073	0.063	0.010	0.128	0.067	0.016
	(4.07)	(4.51)	(3.83)	(0.29)	(6.91)	(3.62)	(0.40)
	[4.71]	[5.09]			[11.49]		
li_{it}	0.130	0.168	0.198	0.108	0.166	0.288	0.058
	(1.16)	(1.4)	(1.68)	(1.32)	(1.22)	(2.14)	(0.63)
	[1.20]	[1.65]			[1.54]		
$open_{it-1}$	-0.035	-0.027	-0.030	0.011	-0.014	-0.020	0.005
	(-2.41)	(-2.17)	(-2.11)	(0.82)	(-0.95)	(-1.24)	(0.39)
	[-2.05]	[-2.63]			[-1.07]		
g_{it-1}	0.270	0.213	0.207	0.141	0.074	0.120	0.201
	(3.61)	(3.09)	(3.66)	(0.96)	(0.83)	(1.69)	(2.53)
	[4.59]	[3.95]			[1.17]		
$gdppc_{it-1}/1,000$	-0.031	-0.071	-0.109	-0.161	-0.092	-0.120	-0.043
	(-0.41)	(-0.72)	(-0.93)	(-1.39)	(-1.38)	(-1.02)	(-0.54)
	[-0.51]	[-0.91]			[-1.25]		
cp_{it}	**1.510**	**0.620**	**0.425**	**-1.610**	**1.289**	**0.138**	**-0.090**
	(5.07)	**(1.92)**	**(1.07)**	**(1.39)**	**(4.17)**	**(0.37)**	**(1.01)**
	[6.80]	**[2.39]**			**[7.19]**		
$contrib_{it}$	0.184	0.060	0.0270	-0.217	0.090	0.030	0.109
	(1.63)	(0.79)	(0.31)	(0.66)	(0.71)	(0.27)	(0.65)
	[1.92]	[0.59]			[1.05]		
$elect_{it}$	-0.253	-0.636	-0.726	-0.990	0.002	-0.436	-0.695
	(-0.80)	(-2.65)	(-2.49)	(-3.68)	(0.01)	(-1.33)	(-3.00)
	[-0.94]	[-4.23]			[0.01]		
$left_{it}$	0.000	-0.005	-0.005	0.001	-0.008	-0.007	0.001
	(-0.04)	(-1.65)	(-1.31)	(0.15)	(-1.80)	(-1.93)	(0.23)
	[-0.03]	[-1.58]			[-1.29]		
EU_{it}	-0.750	-0.002					
	(-0.68)	(-0.00)					
	[-0.58]	[-0.00]					
Time dummies	yes	yes	yes	yes	yes	yes	yes
(p-value)	0.000	0.000	0.000	(time demean)	0.000	0.000	(time demean)
Time trend	specific	specific	specific	no	specific	specific	no
(p-value)	0.000	0.000	0.000		0.000	0.000	
No. instrum.				35			34
Hansen (p-value)				0.725			0.892
AR(2) test (p-value)				0.539			0.738
R2 (within)	0.588	0.735			0.661		
No. of countries	27	27	27	26	25	25	25
No. of obs.	406	400	400	373	329	311	300

Notes: t-values in parentheses if not stated otherwise: FE: (White-Huber robust s.e.) / [Driscoll-Kraay s.e.]; LSDVc: 500 bootstrap replications.

Table 10: Determinants of primary budget balances (*without country-specific time trend*)

	All time periods			**Only EU members**	
	FE stat.	**FE dyn.**	**LSDVc**	**FE stat.**	**LSDVc**
	(1)	(2)	(3)	(4)	(5)
bal_{it-1}		0.670	0.768		0.811
		(17.43)	(20.45)		(16.98)
		[12.41]			
d_{it-1}	0.014	0.022	0.022	0.026	0.024
	(1.21)	(3.05)	(2.41)	(2.2)	(2.87)
	[0.91]	[2.98]		[1.41]	
li_{it}	0.058	0.084	0.104	0.101	0.196
	(0.61)	(1.07)	(1.58)	(0.88)	(2.46)
	[0.48]	[1.13]		[0.71]	
$open_{it-1}$	0.002	-0.004	-0.004	0.009	0.001
	(0.23)	(-0.49)	(-0.44)	(0.83)	(0.06)
	[0.22]	[-0.52]		[0.79]	
g_{it-1}	0.345	0.178	0.169	0.182	0.108
	(4.69)	(2.68)	(3.54)	(2.04)	(1.87)
	[4.23]	[3.08]		[1.86]	
$gdppc_{it-1}/1,000$	-0.02	0.003	-0.124	-0.052	-0.051
	(-0.30)	(0.05)	(-0.20)	(-0.75)	(-0.79)
	[-0.29]	[0.06]		[-0.69]	
cp_{it}	**0.916**	**0.290**	**0.316**	**0.581**	**-0.263**
	(2.64)	**(1.05)**	**(1.00)**	**(1.50)**	**(-0.86)**
	[2.96]	**[1.33]**		**[1.94]**	
$contrib_{it}$	0.199	0.007	-0.017	0.009	-0.026
	(1.8)	(0.11)	(-0.22)	(0.83)	(-0.28)
	[1.44]	[0.09]		[1.24]	
$elect_{it}$	-0.341	-0.772	-0.817	-0.232	-0.57
	(-0.96)	(-3.18)	(-2.90)	(-0.64)	(-1.84)
	[-1.12]	[-4.80]		[-0.77]	
$left_{it}$	0.001	-0.003	-0.004	-0.004	-0.004
	(0.13)	(-1.42)	(-1.49)	(-1.01)	(-1.25)
	[0.08]	[-1.27]		[-0.90]	
EU_{it}	-1.217	0.158	0.346		
	(2.64)	(0.23)	(0.49)		
	[-0.88]	[0.20]			
Time dummies	yes	yes	yes	yes	yes
(p-value)	0.000	0.000	0.000	0.000	0.000
Time trend	no	no	no	no	no
R2 (within)	0.3526	0.683		0.3608	
No. of countries	27	27	27	25	25
No. of obs.	406	400	400	329	311

Notes: t-values in parentheses if not stated otherwise: FE: (White-Huber robust s.e.) / [Driscoll-Kraay s.e.]; LSDVc: 500 bootstrap replications.

Table 11: Determinants of primary budget balances (*without contributions to the EU and political variables*)

	All time periods				**Only EU members**		
	FE stat.	**FE dyn.**	**LSDVc**	**SYS-GMM**	**FE stat.**	**LSDVc**	**SYS-GMM**
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
bal_{it-1}		0.551	0.708	0.779		0.732	0.73
		(6.46)	(15.67)	(10.78)		(13.29)	(8.03)
		[7.20]					
d_{it-1}	0.088	0.067	0.056	0.03	0.119	0.059	0.063
	(2.28)	(3.41)	(3.62)	(1.39)	(7.08)	(3.83)	(1.78)
	[-5.03]	[-4.59]			[-9.80]		
li_{it}	0.104	0.11	0.144	0.024	0.198	0.302	-0.031
	(0.95)	(0.94)	(1.51)	(0.52)	(1.61)	(2.41)	(-0.40)
	[-0.96]	[-1.13]			[-0.28]		
$open_{it-1}$	-0.024	-0.011	-0.013	0.011	0.004	0.001	0.007
	(-0.78)	(-0.72)	(-1.00)	(0.95)	(0.28)	(0.04)	(0.45)
	[-1.16]	[-0.79]			[-0.28]		
g_{it-1}	0.286	0.199	0.19	0.171	0.092	0.116	0.15
	(2.28)	(2.46)	(3.29)	(1.63)	(1.05)	(1.57)	(1.41)
	[-4.42]	[-3.52]			[-1.33]		
$gdppc_{it-1}/1,000$	-0.014	-0.012	-0.05	-0.114	-0.105	-0.103	-0.001
	(-0.11)	(-0.15)	(-0.51)	(-1.22)	(-1.77)	(-0.92)	(-0.01)
	[-0.20]	[-0.16]			[-1.51]		
cp_{it}	**1.537**	**0.711**	**0.528**	**-1.291**	**1.25**	**0.182**	**-0.509**
	(3.78)	**(3.40)**	**(1.68**	**(-1.48)**	**(4.32**	**(0.53**	**(-0.48)**
	[-6.58]	**[-2.92]**			**[-5.74]**		
EU_{it}	0.656	0.258	0.15	1.45			
	(1.12)	(0.46)	(-0.29)	(-1.55)			
	[-1.02]	[-0.64]					
Time dummies	yes	yes	yes	yes	yes	yes	yes
(p-values)	0	0	0	(time demean)	0	0	(time demean)
Time trend	specific	specific	specific	no	specific	specific	no
(p-values)	0	0	-0.248		0	-0.929	
No. instruments				29			28
Hansen (p-value)				0.503			0.343
AR(2) test (p-value)				0.743			0.629
R2 (within)	0.57	0.717			0.641		
No. of countries	27	27	27	27	27	25	27
No. of obs.	433	427	427	400	356	336	325

Notes: t-values in parentheses if not stated otherwise: FE: (White-Huber robust s.e.) / [Driscoll-Kraay s.e.]; LSDVc: 500 bootstrap replications.

Table 12: Determinants of primary budget balances (*lagged CF variable*)

	All time periods				**Only EU members**		
	FE stat.	**FE dyn.**	**LSDVc**	**SYS-GMM**	**FE stat.**	**LSDVc**	**SYS-GMM**
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
bal_{it-1}		0.568	0.733	0.686		0.76	0.627
		(11.00)	(15.28)	(7.76)		(13.01)	(8.62)
		[7.68]					
d_{it-1}	0.09	0.072	0.06	0.079	0.129	0.064	0.09
	(4.18)	(4.38)	(3.63)	(1.8)	(6.92)	(3.37)	(2.76)
	[4.83]	[5.13]			[11.44]		
li_{it}	0.13	0.147	0.177	-0.001	0.187	0.275	-0.051
	(1.18)	(1.23)	(1.53)	(0.01)	(1.38)	(2.00)	(0.38)
	[1.14]	[1.45]			[1.70]		
$open_{it-1}$	-0.04	-0.029	-0.03	-0.021	-0.02	-0.019	-0.026
	(-2.64)	(-2.27)	(-2.13)	(-1.02)	(-1.33)	(-1.21)	(-1.62)
	[-2.22]	[-2.81]			[-1.39]		
g_{it-1}	0.283	0.221	0.216	0.03	0.1	0.129	0.069
	(3.71)	(3.13)	(3.79)	(0.29)	(1.13)	(1.84)	(0.70)
	[4.10]	[3.84]			[1.59]		
$gdppc_{it-1}/1,000$	-0.042	-0.077	-0.124	-0.095	-0.098	-0.132	0.009
	(-0.52)	(-0.77)	(-1.03)	(-0.45)	(-1.40)	(-1.12)	-0.08
	[-0.66]	[-0.96]			[-1.22]		
cp_{it}	**1.181**	**0.264**	**0.083**	**-0.844**	**1.023**	**-0.091**	**-0.308**
	(3.24)	**(0.79)**	**(0.21)**	**(-0.61)**	**(2.97)**	**(-0.23)**	**(-0.8)**
	[3.63]	**[1.27]**			**[3.60]**		
$contrib_{it}$	0.169	0.065	0.036	-0.403	0.072	0.039	-0.549
	(1.46)	(0.83)	(0.41)	(-1.76)	(0.56)	(0.35)	(-1.99)
	[1.82]	[0.60]			[0.81]		
$elect_{it}$	-0.269	-0.634	-0.72	-0.998	0.057	-0.426	-0.614
	(-0.85)	(-2.62)	(-2.48)	(-3.74)	(0.18)	(-1.32)	(-2.78)
	[-0.95]	[-4.18]			[0.22]		
$left_{it}$	-0.002	-0.006	-0.005	0.002	-0.009	-0.007	-0.001
	(-0.40)	(-1.84)	(-1.34)	(0.48)	(-1.95)	(-1.89)	(-0.24)
	[-0.30]	[-1.74]			[-2.02]		
EU_{it}	-0.391	0.055		4.208			
	(-0.35)	(0.06)		(2.27)			
	[-0.51]	[0.05]					
Time dummies	yes	yes	yes	yes	yes	yes	yes
(p-value)	0.000	0.000	0.000	(time demean)	0.000	0.000	(time demean)
Time trend	specific	specific	specific	no	specific	specific	no
(p-value)	0.000	0.000	0.000		0.000	0.000	
No. instrum.				35			34
Hansen (p-value)				0.823			0.743
AR(2) test (p-value)				0.313			0.555
R2 (within)	0.580	0.732			0.656		
No. of countries	27	27	27	26	25	25	25
No. of obs.	406	400	400	373	329	311	300

Notes: t-values in parentheses if not stated otherwise: FE: (White-Huber robust s.e.) / [Driscoll-Kraay s.e.]; LSDVc: 500 bootstrap replications.

Table 13: Determinants of primary budget balances (*one-step first-differenced GMM instead of SYS-GMM*)

	All time periods	**Only EU members**
	(1)	(2)
bal_{it-1}	0.682	0.62
	(7.56)	(7.77)
d_{it-1}	0.089	0.094
	(2.1)	(2.84)
li_{it}	-0.031	-0.064
	(-0.23)	(-0.51)
$open_{it-1}$	-0.017	-0.026
	(-0.67)	(-1.34)
g_{it-1}	0.005	0.059
	(0.04)	(0.60)
$gdppc_{it-1}/1,000$	-0.156	-0.008
	(-0.70)	(-0.06)
cp_{it}	**-0.017**	**0.236**
	(-0.01)	**(0.15)**
$contrib_{it}$	-0.589	-0.636
	(-2.83)	(-3.08)
$elect_{it}$	-1.031	-0.608
	(-3.29)	(-2.59)
$left_{it}$	0.002	-0.001
	(0.61)	(-0.20)
EU_{it}	5.391	
	(3.00)	
Time dummies	yes	yes
(p-value)	(time demean)	(time demean)
Time trend	no	no
No. instrum.	29	28
Hansen (p-value)	0.762	0.657
AR(2) test (p-value)	0.290	0.815
No. of countries	26	25
No. of obs.	347	275

Notes: t-values in parentheses if not stated otherwise.

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