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Bank Mergers in the Financial Crisis – A Competition Policy Perspective

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Bank Mergers in the Financial Crisis – A Competition Policy Perspective

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Abstract: We analyze a large merger in the Dutch banking market during the financial crisis using disaggregated data. Based on a merger simulation model, we evaluate merger-induced changes in the interest rates for savings accounts. We find that the merging banks decreased interest rates by 3 to 5 percent and competitors by up to 1 percent. These anti-competitive effects translate into a loss of consumer welfare by roughly 69 million euros in 2010. We identify heterogeneous effects indicating that less educated consumers with lower savings are most affected. Our findings highlight the important role of competition policy during financial crisis mitigation.

JEL: D22, G21, G34, L11, L25, L40, L41

Keywords: Antitrust, competition policy, merger analysis, state aid, retail banking, random-coefficients logit models, differentiated products.

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In practice, economic policy goals can be at odds with competition policy. While policy makers often put forward the protection of jobs,[1] in banking, the stabilization of financial markets is a major policy goal, especially during the recent financial crisis. Allowing market consolidation through mergers served as a measure to mitigate the adverse effects of the financial crisis in several cases (e.g. JPMorgan Chase and Bear Stearns, or Bank of America and Merrill Lynch in the U.S.; Lloyds and HBOS in the U.K.; and mergers between Landesbanken in Germany).

Such measures, however, were controversial from the perspective of competition policy in the markets. For instance, the Competition and Markets Authority in the U.K. (formerly Office of Fair Trading) objected to the merger of Lloyds and HBOS, voicing concerns about the greater than 30% market share of the new entity and the elimination of HBOS as a challenger to the four larger established banks. Despite these concerns, the U.K. Secretary of State overruled the objection in accordance with the Bank of England, the Financial Services Authority, and the Treasury, stressing the necessity to maintain financial stability (Vives, 2016). This example illustrates the dilemma policy makers may find themselves in. While mergers might be instrumented to mitigate the effects of financial crises, interventions could result in increases of market power harmful to consumers.

In this paper, we investigate the competition effects of the merger of ABN AMRO and Fortis Bank NL in the Dutch retail banking market. Being one of the largest bank takeovers in recent years, financial stability concerns prompted policy makers to engage in substantial market interventions involving state aid. Originally, Fortis intended to take over the Dutch business of ABN AMRO. However, after facing serious difficulties raising capital after the outbreak of the financial crisis, Fortis needed to be nationalized by the Netherlands, Belgium, and Luxembourg. The Dutch state decided to complete the merger in the already concentrated Dutch market.

The Dutch state's decision to continue the merger after bailing out the banks was

[1]See, e.g., the *EDEKA/Kaiser's Tengelmann* merger in the German supermarket sector in 2015. Although the merger had been prohibited by the German Federal Cartel Office, the German Minister of Economic Affairs issued a ministerial authorization conditionally clearing the merger arguing that job security prevails over the expected restraints on competition.

justified by expected yearly pre-tax synergies of 1.1 billion euros, integration costs of about 1.2 billion euros, and the aim to earn back the cost of its intervention (European Commission, 2011).[2] The EC's conditional merger approval included divestment remedies worth 1.12 billion euros, which, however, did not affect all business units. The retail business unit, for instance, remained untouched by divestments.

To analyze the merger for potential anti-competitive effects, we focus on the Dutch market for savings accounts – a market which is deemed highly concentrated by both the Dutch central bank (DNB, 2015) and the Dutch competition authority (ACM, 2014) years after the merger. Looking at the anti-competitive effects of the merger during and after the global financial crisis might be even more relevant, given the more pronounced effect of income shocks on consumers during recessions.

To single out the competition effects of the merger from the generally lowered interest rate environment, we employ estimates from a structural model to simulate product-level interest rates for the two distinct cases of joint and separate ownership of ABN AMRO and Fortis Bank NL for 2010, with data from the calibration period 2007 to 2009. We model demand for savings accounts as discrete choice for differentiated goods by identifying the consumers' product choice on the market for savings accounts. Employing a disaggregated approach based on the characteristics of both products and consumers helps to attenuate the endogeneity problem between prices and unobserved product characteristics by assuming that a single household has no impact on savings account deposit rates nor characteristics (Goldberg, 1995). On the supply side, we model interactions between banks assuming Bertrand Nash competition in a multiproduct oligopoly. Calibrating the model with demand-side interest rate elasticities derived from a random-coefficients logit model allows us to simulate bank behavior in the two different scenarios of joint and separate ownership of ABN AMRO and Fortis Bank NL. By making adjustments to the ownership structure in the model, we contrast predicted pricing behavior of the banks

[2]The merger was initially motivated by referring to similar figures prior to the crisis. In its offer, the consortium anticipated pre-tax synergies of 1.3 billion euros p.a. and integration costs of 1.54 billion euros for the *Fortis/ABN AMRO* merger. See https://investors.rbs.com/~/media/Files/R/RBS-IR/archived-presentations/archived/consortium-presentation-29-may-07.pdf, last accessed on October 24, 2019.

in the merger case with the no-merger case. Comparing predicted values of both cases instead of comparing model predictions to realized values allows us to isolate the competition effects induced by a changed ownership structure from changes in financial market conditions.

Our empirical analysis draws on the representative DNB Household Survey (DHS) comprising detailed yearly information on the savings behavior of individuals from more than 2,000 Dutch households. We merge the survey data with product-level information on savings accounts, including interest rates and account restrictions (used for product differentiation) retrieved from price comparison websites specialized on the Dutch market for financial savings products.[3] Our main data covers the years from 2007 to 2010, enabling us to observe consumer choice conditional on relevant product characteristics and corresponding individual choice sets over time.

We predict that the merger had a significant effect on interest rates in the market. In our model, in the case of a merger, ABN AMRO and Fortis Bank NL have 3% and 5% lower interest rates, respectively, as compared to the case of no merger. The other competitors lower their interest rates by up to 1%. Furthermore, we are able to identify heterogeneous consumer effects. Less educated consumers with lower savings are most affected. Our results suggest that the anti-competitive effects entail a total consumer welfare loss of about 69 million euros in 2010. Our robustness checks with different assumptions on expectations on the changing monetary environment confirm these results. Bearing in mind that we only analyze the market for savings accounts, the impact of the merger on retail consumers might be even larger, given potential anti-competitive effects for other financial products such as fixed-term deposits, checking accounts, or mortgage loans. This raises the notion of taking into account these additional social costs when merging banks for the sake of financial stability.

Our paper aligns with both the empirical banking literature and the applied industrial organization literature using structural models to conduct counterfactual analyzes. In this regard, there has been an increasing number of such studies in banking recently. Crawford

[3]We obtain most data from www.spaarinformatie.nl and also employ information from www.spaarrekeningen.nl and www.spaarrentehulp.nl.

et al. (2018) build a comprehensive model to analyze interactions between asymmetric information and imperfect competition in the Italian lending markets. Egan et al. (2017) analyze the feedback loop between financial distress and the ability to access (uninsured) deposits in the US. Honka et al. (2017) investigate how advertising influences consumer choice in the US retail banking market. Molnar et al. (2013) estimate demand for deposit services in order to test supply models in the Italian retail banking market. Finally, Dick (2008) uses a structural model to estimate demand for deposit services of U.S. commercial banks and measures the effects of US branching deregulation.

Examples for merger simulations are Björnerstedt and Verboven (2016), Ivaldi and Verboven (2005) and Molnar (2008). Björnerstedt and Verboven (2016) conduct a merger simulation and ex-post evaluation in the Swedish market for analgesics to test merger simulation as a prediction tool. Ivaldi and Verboven (2005) analyze a merger in the European truck market and compare the prediction of the merger simulation to other market power tests. Molnar (2008) applies merger simulation to the Finish banking market using aggregated data.

While many other studies follow Berry et al. (1995) and analyze consumer choice in a discrete choice setting using aggregated data, our contribution to the merger simulation literature employs consumer-level data. The use of such disaggregated data is better suited to describe demand choices driven by heterogeneous preferences and general substitution patterns. We further rely on the assumption that individual consumers are price takers and thus respond to concerns about the simultaneity bias inherent to demand estimation at the market level. To the best of our knowledge, we are the first to apply merger simulation methods in the context of banking using disaggregated data. We aim to contribute to the understanding of the banking markets, given its importance for national economies.

The paper is structured as follows. In the next section, we provide background information on the merger of ABN AMRO and Fortis Bank NL, and the Dutch banking market. Section 2 introduces the model and the steps we undertake for simulation. Section 3 describes in detail the compilation of our dataset. Sections 4 and 5 present

the estimation and our results, respectively, while section 6 provides a summary and conclusion.

1 The Merger of ABN AMRO and Fortis Bank NL

The sale of ABN AMRO was initiated by a publicly disclosed letter of the British hedge fund TCI complaining to ABN AMRO about poor share price returns, urging to "actively pursue the potential break up, spin-off, sale or merger."[4] The letter from February 2007 echoed in the media, reinforcing discussions and negotiations about a sale of ABN AMRO. After a bidding battle between the British bank Barclays and a consortium of Royal Bank of Scotland, Fortis, and Banco Santander, the majority of ABN AMRO's shareholders accepted the consortium's offer worth 71.1 billion euros in October 2007, making it one of today's largest bank takeovers.

The consortium's plan to split the assets of ABN AMRO allowed the Royal Bank of Scotland to obtain the business units Private and Business Clients in Asia, Europe, and North America, while Banco Santander received Banco Real and Antonveneta. Fortis obtained the business units Asset Management, Private Banking, and Netherlands, which it intended to merge with its own Dutch arm Fortis Bank NL. All cases were subject to merger control by the European Commission.

Regarding the Dutch assets, the EC conditionally approved the merger of ABN AMRO and Fortis in October 2007. The European Commission (2007) had concerns regarding the Dutch commercial banking market insofar as the combination of the first (ABN AMRO) and fourth largest bank (Fortis Bank NL) would significantly increase the already high concentration level. It requested the sale of several components of the Dutch business unit before the merger could become legal in order to protect corporate customers from reduced competition. The EC, however, did not raise concerns about anti-competitive effects in the similarly concentrated retail banking market on account of the modest market share of Fortis Bank NL (them being a distant fourth player in terms of market

[4]See http://www.telegraph.co.uk/finance/2804714/Letter-from-TCI-to-ABN-Amro.html, last accessed on October 24, 2019.

position after ING, Rabobank, and ABN AMRO).

In the first half of 2008, the consortium sold the individual business units to the consortium members. At the same time, Fortis was preparing the sale of the merger remedy to Deutsche Bank when the global financial crisis of 2008 broke out. Fortis faced liquidity issues in part because of the high acquisition price for ABN AMRO (share of Fortis: 24 billion euros), needing to be eventually rescued in a combined effort of the three governments of the Netherlands, Belgium, and Luxembourg. The Dutch state purchased the Dutch business of Fortis for 16.8 billion euros in October 2008. This move also included the stake in the holding of the consortium comprising the Dutch activities of ABN AMRO.

Willing to finalize the intended but frozen merger (European Commission, 2011, recital 42), the Dutch state provided liquidity facilities to implement the separation of the Dutch activities of ABN AMRO from the holding of the consortium, and to cover the costs of the EC divestiture-remedy realized as the sale of several components to Deutsche Bank in April 2010. While this resulted in the finalization of the initial merger of Fortis Bank NL and ABN AMRO in July 2010, the capital injections of the Dutch state were subject to state aid investigations by the EC. The European Commission (2011) concluded in April 2011 that the recapitalization measures amounting to between 4.2 and 5.45 billion euros (excluding the takeover price[5]) constituted state aid. Yet the EC acknowledged that the need for supporting the banks rather stemmed from undercapitalization than excessive risk taking or unsustainable business models, thereby approving the support package.

The approval, however, was subject to a set of conditions, including (amongst others) a ban on acquisitions and on advertising state ownership, as well as restrictions on price leadership for standardized savings and mortgage products. In other words, ABN AMRO was not allowed to offer price conditions which could not be matched by non-aided competitors. These conditions were set for a duration of three years and would be prolonged to a maximum of five years if the Dutch state continued to hold more than 50% of the

[5]The purchase price was not considered as representing state aid to the two entities as they did not receive the corresponding money.

ordinary shares after three years. During the state aid investigations, the Dutch state expressed its commitment to a complete exit, aiming to recover its initial investment plus funding costs. Despite a successful IPO in November 2015, the Dutch state still held a 56.3% stake in ABN AMRO in October 2019.[6] The bans therefore only expired in April 2016.[7]

Years after the merger, the Dutch central bank has concluded that high concentration is persistent in the Dutch banking sector, calling for less dominance of large banks and the necessity to promote the position of small banks and niche players. It mentions the recent mergers in the market (*ABN AMRO/Fortis Bank NL* and *Rabobank/Friesland Bank*) as one source of high concentration (DNB, 2015). Furthermore, the Dutch competition authority finds that the retail banking sector has become less competitive after the financial crisis and identifies the consumers' limited propensity to switch banks (consumer inertia) as another reason for low competitiveness (ACM, 2014).

2 Model

In our analysis of merger effects, we focus on the Dutch market for savings accounts. As for other retail banking markets, we choose this market because we can more easily compare between products contrary to other banking products. For instance, fixed-term deposits might exhibit different maturities and are thus not easily comparable. Another argument for comparability is that fees do not apply to savings accounts (in the Netherlands). Furthermore, for savings accounts, we can be more confident that consumer choice is driven by a single saving motive, contrary to checking accounts which primarily serve to cater transactional purposes (e.g. payments, reference account to receive salary, etc.).

Our analysis is based on a structural model comprising demand and supply as two building blocks. We use estimated demand-side parameters to calibrate the model. Making assumptions on joint bank behavior closes the model. With our model, we are able

[6] See https://www.abnamro.com/en/about-abnamro/our-company/corporate-governance/shareholder-structure/index.html, last accessed on October 24, 2019.

[7] The prolongation did not apply to the price leadership ban which was set for three years only.

to simulate different market outcomes regarding changes in the ownership of the banks.

2.1 Demand

We use a mixed multinomial logit model (mixed logit model) for the demand side. Assuming a random utility model (RUM), we can interpret the mixed logit model as a random-coefficients model in which the coefficients vary between individuals.

Indirect utility of consumer i for the savings account product j of bank b at time t can be expressed as

$$\begin{aligned} U_{jt}^{i} &= V_{jt}^{i} + \epsilon_{jt}^{i} \\ &= x_{jt}\beta^{i} + y_{jt}\gamma + \epsilon_{jt}^{i}, \\ i &= 1, ..., I, j = 1, ..., J, b = 1, ..., B, t = 1, ..., T. \end{aligned} \tag{1}$$

The term V_{jt}^{i} reflects the deterministic part of consumer utility and ϵ_{jt}^{i} is a random term which is *iid* extreme value. In our discrete choice setting, each consumer chooses one product from a set of alternatives. RUM consistency implies that a consumer chooses the alternative yielding the highest utility. Furthermore, in the random-coefficients model we can differentiate between variables for which the coefficients β^{i} differ across individuals (i.e. x_{jt}) and variables for which the coefficients γ are constant (i.e. y_{jt}). Note that the corresponding vector of coefficients for x_{jt} carries the superscript i in equation (1).[8]

The mixed multinomial logit is a generalized form of the the standard conditional logit model introduced by McFadden (1973). The probability of individual i choosing alternative j conditional on the vector of random coefficients β^{i} of individual i is represented by (for expository purposes we will omit the time index t from here onwards):[9]

[8]Note also that the random coefficients model as presented above can be rewritten to $U_{jt}^{i} = x_{jt}\beta + z_{jt}\mu^{i} + \epsilon_{jt}^{i}$, where $\eta_{jt}^{i} = z_{jt}\mu^{i} + \epsilon_{jt}^{i}$ represents the random part of utility. In this error component representation, correlation between alternatives is introduced by the random component $z_{jt}\mu^{i}$ contrary to the standard logit where the error component consists solely of the iid component ϵ_{jt}^{i}.

[9]The subsequent paragraphs introducing the mechanics of the mixed logit follow Train (2009).

$$L_j^i(\beta_i) = \frac{\exp\left(V_j^i(\beta^i)\right)}{\sum_k \exp\left(V_k^i(\beta^i)\right)}. \tag{2}$$

The individual vector β^i, however, is not observable. The (unconditional) mixed logit probability for individual i to choose alternative j is derived as an integral of the standard logit probabilities by integrating out the vector of random parameters β^i and represented by

$$P_j^i = \int \left(\frac{\exp\left(V_j^i(\beta^i)\right)}{\sum_k \exp\left(V_k^i(\beta^i)\right)} \right) f(\beta) d\beta, \tag{3}$$

where $f(\beta)$ is the mixing distribution of the vector of random coefficients, usually specified to be normal or log-normal.[10]

One of the advantages of the mixed logit model vis-à-vis the conditional logit model or the nested logit model is that it does not exhibit the independence of irrelevant alternatives (IIA) property at any stage. In the conditional logit model, the ratio of probabilities of two alternatives is independent of the attributes or the existence of all other alternatives yielding rigid substitution patterns. The nested logit model mitigates this problem as the IIA property does not hold for alternatives in different nests. However, it still holds within each nest and the nesting structure requires further assumptions on potential product groupings. In contrast, in the mixed logit model the ratio of probabilities of alternative j and alternative j' is dependent on all attributes and the existence of other alternatives than j or j'. Equation (4) for the cross-price elasticity of a change in the interest rate d of alternative j illustrates the flexibility in the substitution patterns:

$$\eta_{j'j}^i = -\frac{d_j}{P_{j'}^i} \int \beta_d^i L_j^i(\beta) L_{j'}^i(\beta) f(\beta) d\beta, \tag{4}$$

where β_d^i is the individual coefficient on the interest rate d_j. The elasticity differs for

[10] Note that the mixed logit probabilities collapse to the standard logit probabilities when all coefficients are identical across individuals.

each alternative j'. That is, an increase in the interest rate for alternative j will lead to different decreases in the probabilities for each alternative j' unlike in the standard logit model where the probability of choosing alternative j' is canceled out in the formula for the cross-price elasticity. Furthermore, the change in the probability to choose alternative j' depends on the correlation between the conditional likelihoods of choosing alternative j' and j. Alternatives with similar attributes exhibit more switching between each other following price changes. To conclude, in the mixed logit model, the substitution patterns are determined by the mixing distribution and therefore determined empirically by the available data. Apriori assumptions on product groupings are not required.

The disaggregated approach helps to attenuate the endogeneity problem between prices and unobserved product characteristics by assuming that individual demand is significantly small as not to affect firm behavior and thus characteristics nor deposit rates of savings accounts (Goldberg, 1995). Based on the individual-level choices, we derive market-level demand to be used in our simulation exercises through aggregation. For aggregation, we construct population weights based on the distribution of bank choice in our untreated sample, the representative DNB Household Survey.[11]

2.2 Supply

In a simplified banking model, banks generate profits by lending money to firms below their own borrowing costs. As a common approach to the separate analysis of deposit or loan markets, we allow for separate modeling of pricing decisions in the deposit market (see for example Canhoto (2004) or Pita Barros (1999)). We assume banks to maximize profits in the market for savings accounts with the deposit rates as their choice variables. In our case, the choice variables (i.e. the deposit rates) have a negative direct effect on profits. In order not to formulate a degenerated problem, we add $\bar{r_b}$, which is the expected loan rate for bank b. This set-up acknowledges that banks raise deposits to

[11] For our estimation analysis on the product level, we only use observations with consistent answers for product choice as described in the data section. The question for the main bank for savings accounts is answered more frequently, as some respondents do not report the exact account product but the corresponding bank. By weighting according to bank choice, we aim to obtain representative weights for the aggregation procedure.

finance lending.[12] Each bank thus has an individual, model-exogenous expectation on its returns on deposits.

Offering savings accounts to consumers involves both variable and fixed operating costs which differ across account products. Variable costs are, for example, additional needs for IT capacity and employees for administration and the provision of customer services. The difference in variable costs across products can result from reduced costs for services as for example for internet managed accounts or from differences in cost efficiencies across banks. We introduce product-specific costs c_j denoting the per unit of demand costs for account product j. We assume c_j for each product to be constant over time. The maximization problem of bank b offering a subset of products F_b can therefore be written as:

$$\max_{\{d_j \, \forall j \in F_b\}} \pi_b(\mathbf{d}) = \sum_{j \in F_b} (\bar{r_b} - c_j - d_j) q_j(\mathbf{d}), \tag{5}$$

where $q_j(\mathbf{d})$ depicts demand for savings account j and $\mathbf{d}$ is a $J \times 1$ vector of deposit rates. We can think of the term $\bar{r_b} - c_j$ $(= r_{j,net})$ as the expected loan rate (net of marginal costs) specific to product j. Setting d_j allows the bank to set the profit margin, $r_{j,net} - d_j$ for product j. This is analogous to the formulation of the problem when prices enter positively into the firms' profit functions and profit margins are equal to $p_j - mc_j$.

Taking into account the optimal pricing decision rules for all banks while assuming Bertrand competition, the Nash equilibrium is defined by the following system of first-order conditions:

$$-q_j(\mathbf{d}) + \sum_{k \in F_b} (\bar{r_b} - c_k - d_k) \frac{\partial q_k(\mathbf{d})}{\partial d_j} = 0, \qquad j = 1, ...J. \tag{6}$$

Equation (6) can be rewritten in vector notation:

$$-\mathbf{q}(\mathbf{d}) + \{\boldsymbol{\theta} \odot \boldsymbol{\Delta}(\mathbf{d})\}(\mathbf{r_{net}} - \mathbf{d}) = 0 \tag{7}$$

where $\mathbf{q}(\mathbf{d})$ is the $J \times 1$ demand vector, $\mathbf{r_{net}}$ is the $J \times 1$ expected net loan rate vector

[12] Banks can also use savings accounts as instruments meant to acquire client information, or to cross sell (Džmuráňová & Teplý, 2016).

and $\boldsymbol{\Delta}(\mathbf{d}) \equiv \partial \mathbf{q}(\mathbf{d})/\partial \mathbf{d}'$ is the $J \times J$ Jacobian of first derivatives. $\boldsymbol{\theta}$ is the $J \times J$ product-ownership matrix, with $\theta(j,k) = 1$ if savings accounts j and k are offered by the same bank and $\theta(j,k) = 0$ otherwise. $\odot$ depicts element-by-element multiplication. Equation (7) can be used to back out the term $\mathbf{r_{net}}$, which we need for the subsequent merger simulation.

2.3 Merger Simulation

We simulate product-level interest rates for the two distinct cases of joint and separate ownership of ABN AMRO and Fortis Bank NL for 2010 in order to obtain simulated changes in the interest rates induced by the merger. We fit equation (7) with actual data from 2009 to back out the expected net loan rate vector $\mathbf{r}_{net}^{2009}$. In order to simulate interest rates for 2010, following Björnerstedt and Verboven (2014) we rewrite equation (7) and solve for 2010 interest rates for both cases, $\mathbf{d}_{case}^{2010}$, $case \in \{\text{merger}, \text{no merger}\}$. Thus, we are using bank first-order conditions based on estimated pre-merger demand parameters, expected net loan rates $\mathbf{r}_{net}^{2009}$ and the respective product-ownership matrix $\boldsymbol{\theta}_{case}^{2010}$:

$$\mathbf{d}_{case}^{2010} = \mathbf{r}_{net}^{2009} - \{\boldsymbol{\theta}_{case}^{2010} \odot \boldsymbol{\Delta}^{2009}(\mathbf{d}_{case}^{2010})\}^{-1}\mathbf{q}(\mathbf{d}_{case}^{2010}). \tag{8}$$

We solve for deposit rates using the system of linear demand functions $\mathbf{q}(\mathbf{d}) = \mathbf{a} + \boldsymbol{\Delta}(\mathbf{d})'\mathbf{d}$ employing a constant Jacobian matrix of first derivatives $\boldsymbol{\Delta}(\mathbf{d})$ and $\mathbf{a}$ being the vector of intercepts (Davis & Garcés, 2010). We simulate prices on the product level and provide aggregated bank-level effects of the merger using product-level market shares as weights. The benefit of simulating merger effects for 2010 is that the products of the merging entity mostly stayed in the market until at least until 2011. Therefore, we do not have to consider strategic product portfolio rebalancing decisions.

Note that our simulation is based on the assumption of constant expected net loan rates, i.e. we employ pre-merger $\mathbf{r}_{net}^{2009}$. In this vein, we isolate the competition effects induced by a changed ownership structure from changes in financial market conditions. The low interest rate environment is presumed to affect the expected net loan rates of

banks, as their lending conditions might change.[13]

As robustness checks, we adjust the estimates for the expected net loan rate using the change of the 3-months Euribor interbank lending rate between 2009 and 2010 to account for less profitable investment possibilities mainly resulting from changing monetary policy.[14] We employ three approaches to capture the effects of the Euribor. (i) We simply add the (negative) difference in the interbank lending rate.[15] (ii) We identify the relationship between pre-merger $\mathbf{r}_{net}$ and Euribor based on a regression and add the estimated (negative) effect of a changed Euribor. (iii) We estimate the same relationship as in (ii) using the full period 2007-2014.

Note that in the third case, we employ backed-out $\mathbf{r}_{net}$ from all years. This approach incorporates the assumption that the form of competition does not change. That is, we always assume Bertrand Nash competition in a multiproduct oligopoly. This assumption can be challenged not only because of the merger itself but also the involvement of state aid with its behavioral restrictions. Evidence by Dijkstra and Schinkel (2019) suggests that the price leadership bans, which also applied to other state-aided Dutch banks, shifted the Dutch mortgage market from a competitive to a fully collusive price leadership equilibrium. Although the price leadership bans were also targeted at the savings market, we argue that the markets for savings and mortgages are different.[16] In section 3 we provide additional (anecdotal) evidence for Bertrand competition in the savings market in our calibration period. Still, the years after the merger could be affected such that this robustness check has to be considered with caution.

Finally, we want to stress that our analysis aims to isolate the competition effects of the merger. The aforementioned robustness checks help us to obtain predictions that

[13] We do not expect, however, that consumer preferences change as quickly; their utility maximization would still be primarily driven by achieving the highest deposit earnings.

[14] That is, we substitute $\mathbf{r}_{net}^{2009}$ by $\hat{\mathbf{r}}_{\mathbf{net}}^{\mathbf{2010}}=\mathbf{r}_{net}^{2009}+\Delta Euribor$ in simulations using equation (8).

[15] The yearly average of the 3-months Euribor dropped from 1.23% in 2009 to 0.81% in 2010.

[16] Mortgages do not serve a savings purpose; consumers use them to finance home purchases. Pricing of the price leader is (barometrically) based on the nearest rival's funding costs – a particularity that the largest non-aided bank Rabobank seems to have abused when the price leadership bans on its closest followers emerged (Dijkstra & Schinkel, 2019). In the savings market, in contrast, pricing is driven by the banks' motivation to raise funding required to issue loans (besides e.g. cross-selling) (Džmuráňová & Teplý, 2016; ACM, 2014). In addition, switching is less costly in the savings market (ACM, 2014; van der Cruijsen & Diepstraten, 2017) such that there is a higher importance of smaller fringe banks offering higher interest rates.

are closer to the realized interest rates but are no longer independent from the changed monetary policy environment.

3 Data

We construct our dataset by merging data from two sources. We use data from the DNB Household Survey (DHS),[17] a representative Dutch panel survey, to obtain detailed household information, including information on debt and asset holdings. Most importantly, this comprises individual product choices for savings accounts. We retrieve data from Dutch online comparison platforms for banking products to obtain product-level information on savings accounts products.[18] This includes the interest rate paid on the accounts and several forms of restrictions/conditions[19] applying to the account products. We observe all changes in the interest rate[20] and calculate the annual average. Furthermore, we identify the introduction date for each account product and compute how many years a product has already been on the market.

Around 2,000 households participate in the DHS each year. While all members of the household answer questions on general information, only members of the household older than 16 are confronted with questions related to income and wealth. After identifying the account product by the entered account name, we match account product information to each observation.[21] Respondents can enter information for up to seven savings accounts

[17]The data are collected through the 'CentERpanel' at CentERdata, handled by Tilburg University. The DHS consists of several questionnaires for collecting information about household finances and individual financial decisions. The panel of households used for the survey is designed to constitute a representative sample of the Dutch population. Recruitment for the panel is based on a random national sample drawn from private postal addresses. Upon commitment for participation in the panel, households are included in a database. If a household already in the panel drops out of it, another household from the database with similar characteristics is included in the panel. Despite previous agreement to participate in the panel, response rates are typically around 80% and vary across the different questionnaires. In order to achieve full representativeness, sample weights can be used. Participation in the panel is awarded with a financial compensation (Teppa & Vis, 2012).

[18]We obtain most data from www.spaarinformatie.nl and also employ information from www.spaarrekeningen.nl and www.spaarrentehulp.nl.

[19]These comprise: i) online usage only, ii) minimum amount requirements to open and maintain account, iii) bonus on minimum amount on account within a quarter and base rate on remainder, iv) fixed deposits, v) withdrawal limitations and vi) group eligibility constraints (e.g. account can only be opened by students).

[20]We observe on average 1.5 changes per savings account in 2007, 1 in 2008, 6.7 in 2009, and 2.1 in 2010.

[21]Survey participants have to report both the name of the bank and the product name for each of

in the survey. If a person reports several accounts, we assign the one containing the highest amount of savings as a person's main account. If the information on the savings amount is not available, we assign the account yielding the highest interest rate.[22] We drop observations for which we cannot establish a match.[23] Furthermore, we disregard observations for individuals reporting that they do not have any savings account, which corresponds to having chosen the outside option.[24] Thus, we focus on modeling the choice between different account products conditional on using this savings vehicle, and estimating price effects for customers staying in the market. Modeling the decision for alternative savings vehicles is beyond the scope of our paper.

In essence, our dataset includes one observation per person per year, corresponding to the savings account a person has chosen. For every year and every individual, we expand the dataset by all available accounts in the conditional choice set an individual is able to choose from.

Table 1 lists the number of all savings account products in our dataset by bank and year from 2007 to 2010. The first panel lists the amount of products offered by bank. The three large banks (Rabobank, ING and ABN AMRO) offer multiple products including five or more products. The smaller banks seem to specialize and often only offer one product. Roughly speaking, we observe around 60 products in the market per year, two thirds of which are products exhibiting at least one of the above mentioned conditions. Thus, approximately one third of total products is for online usage only.

their accounts. Not all respondents report the exact product name, which requires a hand matching procedure. During hand matching, we rely on a comprehensive list of account products retrieved from 'SpaarInformatie'. Deviations in reporting from actual account names include abbreviations, typos, or alternative naming. During hand matching we compare, on a bank-by-bank basis, the reported answers with all available account products of the respective bank and choose the account closest in terms of name similarity. If a survey participant specifies a bank name but no concrete account name as the respondents have either entered '99' (equivalent to 'I don't know') or reported a generic word for savings account (e.g. rekening), we assign the most often used account of that bank.

[22] Ideally, we would use the savings account with the highest deposits in all cases but this information is not available in all cases. Still, there is a high positive correlation between accounts with the highest interest rate and highest deposits for individuals reporting the savings amount.

[23] We drop observations for which the reported account name corresponds to another bank than actually reported by the survey participant. We drop observations for which no account identification is possible, as given answers are too remote from the actual account names to constitute a reliable match. We also drop observations which could be matched but exhibit inconsistent timing. These are observations for which respondents refer to account products which are not in the market at that time.

[24] This concerns individuals actively reporting that they do not have a savings account or reporting a bank but no account name.

Table 1: Number of products by bank and year

	2007	2008	2009	2010
Rabobank	4	6	7	7
ING Bank	7	8	9	8
ABN AMRO	8	9	9	16
SNS Bank	2	2	2	2
Fortis Bank	4	5	6	-
AEGON	3	4	4	4
Argenta	1	2	2	2
ASN Bank	4	4	4	4
AT Bank	1	2	2	2
Centraal Beheer	-	1	1	1
Credit Europe Bank	1	1	1	1
DSB Bank	2	2	2	-
Friesland Bank	1	1	1	1
GarantiBank	2	2	2	2
Moneyou	-	-	1	1
Nationale-Nederlanden	1	1	1	1
NIBC Direct	-	1	1	1
OHRA	2	2	2	2
RegioBank	4	4	4	4
Robeco	1	1	1	1
Triodos Bank	1	1	2	2
total	49	59	64	62
restricted	31	40	44	42
internet only	14	19	22	21

Notes: The first panel displays the amount of all account products offered by bank and year. The lower panel depicts the total amount of account products, the amount of account products with any kind of restriction, and the amount of account products which are internet managed only in the market by year.

Table 2 shows the market shares derived from our sample for the years 2007 to 2010.[25] For each year, our sample consists only of individuals who were observed in the previous period in order to identify whether a person has opened a new account or (re)chosen the (legacy) account from the previous period. In line with the market description of the Dutch competition authority (ACM, 2014), we observe a highly concentrated market. The three large banks account for almost 80% of the market. Following the three large banks, the market sustains a few mid-sized banks (SNS Bank, Fortis Bank NL, ASN

[25]For reasons of computational convergence we additionally drop savings accounts with consistently inferior market shares of less than 0.1%. Our estimation sample consists of 154 *year* × *account* units for the calibration period 2007-2009.

Bank and Aegon) and a larger group of small fringe banks.

Table 2: Bank chosen for main account

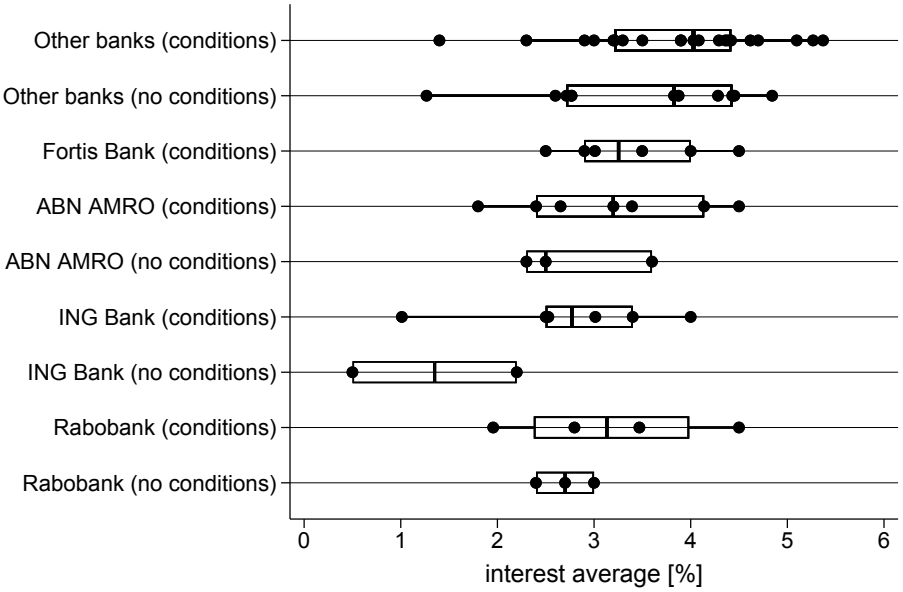
	2007	2008	2009	2010
Rabobank	37.09	38.25	35.63	34.94
ING Bank	28.90	27.48	26.81	28.52
ABN AMRO	12.74	12.35	11.00	15.39
SNS Bank	4.21	4.55	4.98	6.23
Fortis Bank	3.30	3.16	4.02	-
AEGON	3.75	3.81	3.14	3.02
Argenta	0.34	0.56	0.87	0.85
ASN Bank	3.98	4.64	5.50	6.14
AT Bank	0.46	1.02	0.87	0
DSB Bank	1.48	1.11	2.01	-
Friesland Bank	0.68	0.46	0.61	0.38
GarantiBank	0.23	0.09	0.26	0
OHRA	0.34	0.37	1.31	0.94
RegioBank	0.46	0.37	0	0.09
Robeco	2.05	1.49	0.70	1.13
Credit Europe Bank	0	0.19	0.70	0.09
Triodos Bank	0	0.09	0.26	0.28
Moneyou	-	-	0.35	0.85
NIBC Direct	-	0	0.96	1.13
Observations	879	1077	1145	1059

Notes: This table displays the distribution of banks chosen by year in our sample. If a person reports several accounts, we assign the one containing the highest amount of savings as a person's main account. If the information on the savings amount is not available, we assign the account yielding the highest interest rate. We include only individuals who were observed in the previous period in order to identify whether a person has opened a new account or (re)chosen the account from the previous period. We exclude all observations for which we cannot assign a product choice, and individuals who have chosen the outside option. The figures on bank choice are displayed in percentage points.

There is considerable variance in the offered interest rates both across and within banks. Figure 1 illustrates this by comparing the interest rates on accounts in 2008. Accounts are grouped by bank and according to whether account restrictions apply or not. For all banks displayed, restricted accounts offer, on average, higher interest rates than unrestricted accounts. Note that Fortis Bank NL only offered restricted savings accounts. The group of other banks offers on average the highest interest rates. Presumably, smaller fringe banks have to raise awareness in the market or have to fight against

the perception that savings deposited with big banks are safer by means of higher interest rates. The interest rate spread between and within restricted and unrestricted accounts indicates that banks apply product differentiation. Note further that banks offer several unrestricted accounts at different interest rates, which seems to be implausible at first sight. These were often introduced in different years. Anderson et al. (2014) find that banks use product age for price discrimination. New products with higher deposit rates are used to attract new customers while existing customers stick to old products with lower deposit rates. In our estimation, we account for this peculiarity (switching costs).

Figure 1: Interest rate dispersion by bank (2008)



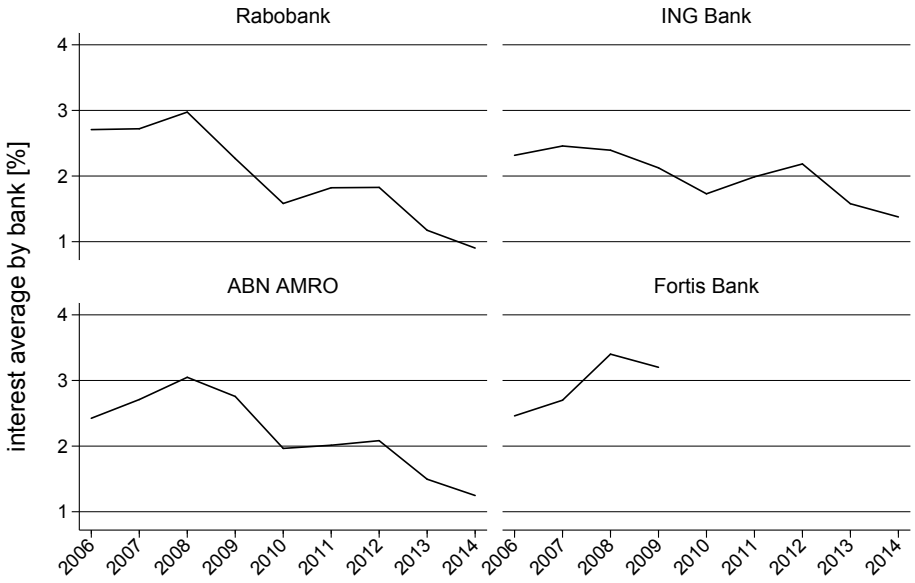
Notes: This figure illustrates interest rates paid on restricted and unrestricted accounts by banks in 2008. Fortis Bank NL only offered restricted account products.
Source: Price comparison websites and own calculations.

The effect of loosening monetary policy after the financial crisis in 2008 is depicted in Figure 2. It displays the average interest rate across savings accounts for the three large banks and Fortis Bank NL from 2007 to 2014. Since 2008, there is a steady decline in the interest rate for all banks with the exception of a short increase starting in 2011. The last products of Fortis Bank NL are withdrawn from the market in 2011.[26]

The changing macroeconomic and monetary conditions do not only affect the average

[26] While ABN AMRO continues these products under its name for some time, customers are successively switched to ABN AMRO products. In our merger simulation, we keep track of the renaming to obtain realizations to which we can compare our predictions.

Figure 2: Development of average interest rates by banks



Notes: This figure illustrates the development of the average interest rate across account products by bank between 2007 and 2014.
Source: Price comparison websites and own calculations.

interest rates but also the dispersion of interest rates offered in the market. In Figure 3 we demonstrate this trend. The spread between the highest and lowest priced account product and, more generally, the variance in interest rates was substantially reduced between 2007 and 2014. Note that the development of interest rates follows the course of the Euribor, which measures the averaged interest rates at which banks offer to lend unsecured funds to each other in the euro area. Interestingly, there seems to be a change after the financial crisis in 2008. From 2009 onwards the interest rates range above the Euribor, suggesting that banks rely less on market funding, and increase their demand for deposit savings. This can be explained by the increased distrust among banks. Taking the usage of the ECB's deposit facility as a distrust indicator (making overnight deposits with the ECB is more expensive than lending to other banks at the EONIA[27] rate), Figure 4 shows that distrust started in 2009 and is still high as of today. This provides additional support for our assumption of Bertrand competition in the market for savings accounts, as the incentive for banks to compete for deposits through the offered interest

[27]The EONIA is the overnight equivalent to the Euribor which is higher than the deposit facility rate but lower than the Euribor.

rate is drastically increased. It especially holds in the year 2009, from which we obtain pre-merger calibration data (the expected net loan rates $\mathbf{r}_{net}^{2009}$) for the merger simulation.

4 Estimation

We estimate the following main specification of the demand side of our model for the calibration period 2007 to 2009:

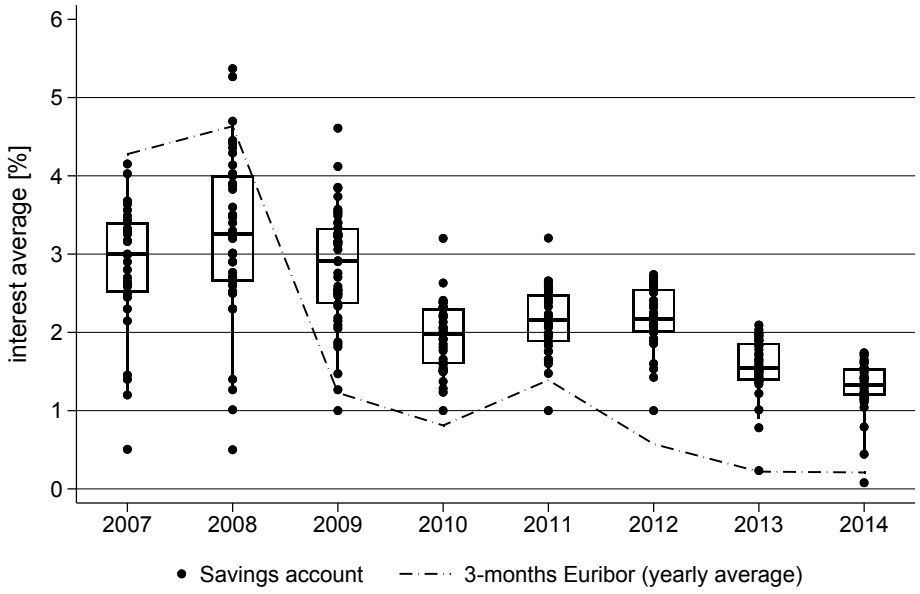
$$\begin{aligned} U_{jt}^{i} = {} & \alpha_b + \beta_1^i (\textit{interest rate}_{jt} | \textit{opened}{=}1 \ {}_t^i) \\ & + \beta_2^i (\textit{interest rate}_{jt} | \textit{holding}{=}1 \ {}_t^i) + \beta_3^i \textit{internet only}_{jt} \\ & + \gamma_1 \textit{minimum amount}_{jt} + \gamma_2 \textit{bonus rate}_{jt} + \gamma_3 \textit{other}_{jt} + \gamma_4 \textit{product age}_{jt} + \epsilon_{jt}^i, \end{aligned} \tag{9}$$

with $i = 1, ..., I, j = 1, ..., J, b = 1, ..., B, t = 1, ..., T$.

In our main specification, our model includes bank intercepts, α_b, in order to account for bank specific characteristics such as brand reputation and marketing expenses, which potentially drive consumer choice on the product-level. Bank fixed effects capture potential correlations between unobserved factors and the interest rate on the bank level. We assume that in the retail banking market unobserved factors potentially influencing consumer decision can be aggregated on the bank level due to several reasons. Firstly, concerns about financial stability apply on the bank level, not on the product level. Secondly, differences in service quality beyond those captured by product differentiation variables should arise only across banks, since banks potentially use the same hotlines, online platforms, etc. for all their products. Thus, past experience for products can be captured on the bank level. Lastly, unlike in the market for consumer goods such as cars, differences in style and reputation should not play a major role for banking products.

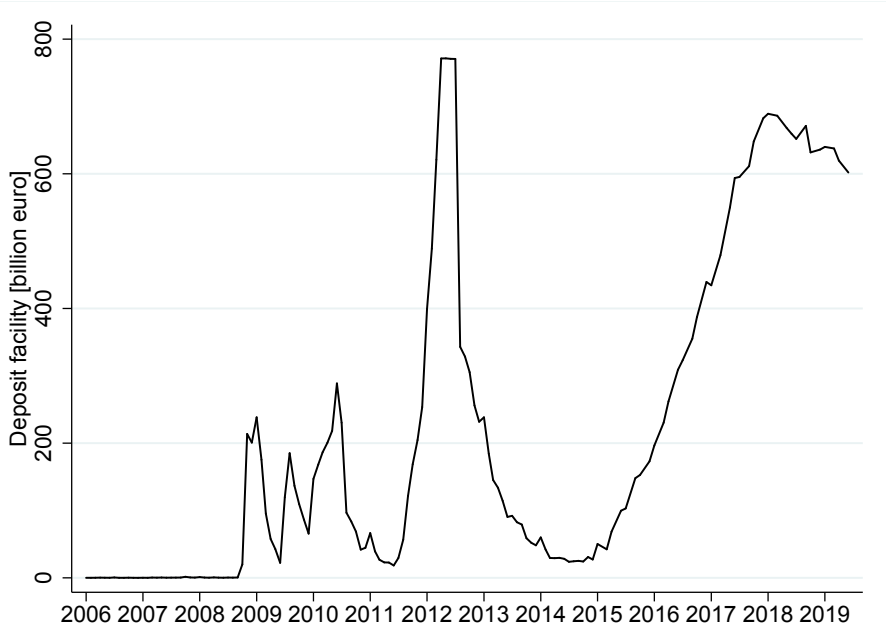
The coefficients for *interest rate* interacted with *opened* and *holding* are random and vary across individuals. We employ the interactions with *opened*, a dummy for whether a person opened the account in period t, and *holding*, a dummy for whether a person (re)chose the same account product as in the previous period $t-1$, in order to account for different sensitivities for the interest rate among customers. We consider individuals

Figure 3: Interest rate dispersion by year



Notes: This figure compares interest rates of all available account products between 2007 and 2014.
Source: Price comparison websites and own calculations.

Figure 4: Usage of ECB deposit facility



Notes: This figure shows the usage of the ECB's deposit facility as an indicator for distrust among banks which prefer making overnight deposits with the ECB rather than lending to each other.
Source: ECB Series ILM.M.U2.C.L020200.U2.EUR.

having chosen a new account (shoppers) to be more aware of market conditions and investment possibilities than individuals sticking to their legacy savings account and potentially being affected by consumer inertia. The random coefficients β_1^i and β_2^i capture additional potential heterogeneity regarding the relevance of the interest rate for product choice across individuals.

The following dummy variables are product characteristics serving product differentiation. The dummy *internet only* indicates whether an account is for online usage only. Its random coefficient β_3^i captures heterogeneous effects across individuals. For instance, younger customers might be more willing to accept online self administration of their accounts due to a higher adaptability to digital processes. The remaining product characteristics enter non-randomly into our model, assuming that the taste for conditions is the same for all customers. The variable *minimum amount* indicates whether interest payment is subject to a certain minimum deposit amount. *bonus rate* depicts whether customers are rewarded for not withdrawing savings by offering a bonus on the minimum amount within a quarter and a (lower) base rate on the remainder. *other* subsumes the restrictions when an account features one or more of the following: fixed deposit plan, withdrawal limitations, or group eligibility constraints (e.g. only for youth). The variable *product age* measures the time a product has already been available in the market in years. As mentioned, banks can use the age of a product as a price discrimination tool.

We estimate our model in a panel to account for correlations in repeated decision making by the same individual (Hole, 2007). Furthermore, in order to account for correlated decision making within households, we cluster standard errors at the household level. Table 3 depicts summary statistics for the chosen savings accounts by year.

Table 3: Summary statistics: product characteristics

	mean	sd	min	max
2007				
Interest average	2.9	.78	.51	4.2
Minimum amount	.28	.45	0	1
Bonus rate	.16	.37	0	1
Other	.12	.32	0	1
Internet	.28	.45	0	1
Product age	3.5	1.5	0	5
Opened	.092	.29	0	1
Holding	.91	.29	0	1
2008				
Interest average	3.2	1	.5	5.3
Minimum amount	.3	.46	0	1
Bonus rate	.18	.38	0	1
Other	.14	.35	0	1
Internet	.3	.46	0	1
Product age	3.9	2	0	6
Opened	.17	.37	0	1
Holding	.83	.37	0	1
2009				
Interest average	2.8	.76	1	4.8
Minimum amount	.33	.47	0	1
Bonus rate	.2	.4	0	1
Other	.11	.31	0	1
Internet	.33	.47	0	1
Product age	4.2	2.4	0	7
Opened	.5	.5	0	1
Holding	.5	.5	0	1
2010				
Interest average	1.9	.37	.8	2.6
Minimum amount	.3	.46	0	1
Bonus rate	.2	.4	0	1
Other	.11	.31	0	1
Internet	.31	.46	0	1
Product age	5	2.5	0	8
Opened	.51	.5	0	1
Holding	.49	.5	0	1

Notes: This table reports summary statistics of variables used in the regression analysis separately by year.

5 Results

5.1 Demand Estimation

Table 4 reports our parameter estimates as effects on marginal utilities. We estimate equation (9) with data from the calibration period 2007 to 2009. The three reported specifications differ with regard to the set of bank fixed effects included. In our main specification (column 1) containing fixed effects for all banks, most estimated parameters are statistically significant at the 1% confidence level.

Regarding the interest rate variables for individuals having opened a new account or (re)chosen their previous account, we obtain two moments for the distribution of the coefficients, since we specified them as random. The average effect for consumers opening a new account is substantially larger than for consumers sticking with their legacy account. We interpret this as a first sign of consumer heterogeneity. Consumers opening a new account can be considered shoppers who are more aware of favorable pricing conditions. Consumers who already made a choice in one of the previous periods react less sensitively to the interest rate, since they might be affected by consumer inertia. A second indication for consumer heterogeneity is that the standard deviations for the three variables specified as random are both large and statistically significant.

Account restrictions have different effects on product choice. The product restrictions *minimum amount*, *internet only*, and the account restrictions subsumed under *other*, affect marginal utilities negatively. This seems reasonable, as conditions such as withdrawal limitations (subsumed in *other*) or a required minimum amount impose true costs or obstacles opening an account. The standard deviation estimated for the random coefficient on *internet only* is surprisingly large, which could reflect heterogeneity in the preference to self administer an account. While some customers might have difficulties in not being able to rely on counter services at bank branches and, for example, commissioning transfers in online portals, others might well cope with doing so and even appreciate products featuring well developed online platforms.[28] The coefficient on *bonus*

[28] While experimenting with other specifications explicitly incorporating consumer age, we found that the negative effect of *internet only* decreases and reverses for younger people.

Table 4: Demand side estimates

	(1)	(2)	(3)
Mean			
Condition: Minimum amount	-0.768***	-0.709***	-0.932***
	(0.097)	(0.089)	(0.082)
Condition: Bonus rate	0.006	0.005	0.143*
	(0.078)	(0.076)	(0.078)
Condition: Other	-0.602***	-0.550***	-0.459***
	(0.124)	(0.118)	(0.115)
Product age	0.550***	0.470***	0.408***
	(0.029)	(0.026)	(0.020)
Interest average|Opened=1	1.324***	1.064***	0.781***
	(0.095)	(0.090)	(0.074)
Interest average|Holding=1	0.420***	0.240***	0.045
	(0.066)	(0.061)	(0.048)
Internet only	-0.700***	-0.635***	-0.825***
	(0.216)	(0.217)	(0.221)
SD			
Interest average|Opened=1	1.438***	1.213***	0.969***
	(0.116)	(0.114)	(0.112)
Interest average|Holding=1	1.275***	1.089***	0.869***
	(0.077)	(0.075)	(0.065)
Internet only	4.997***	5.021***	5.169***
	(0.401)	(0.427)	(0.458)
Observations	158295	158295	158295
Bank fixed effects	for all banks	for each large and mid-sized bank	for each large bank

* p<0.1, ** p<0.05, *** p<0.01

Notes: This table displays the results of different demand side specifications using the mixed logit panel estimator for the calibration period 2007-2009. Reported coefficient estimates represent effects on marginal utilities and not on choice probabilities. Standard errors are clustered at the household level and displayed in parentheses. The interactions with the interest average are mutually exclusive. A person either opened a new account or (re)chose the previous alternative. Hence, the coefficients can be interpreted as group averages. The first panel reports point estimates for the included coefficients. The second panel lists the second moment of the distribution of the covariates specified as random. All estimations include a different set of bank fixed effects which are not reported in the table. Our main specification reported in column (1) contains fixed effects for all banks while (2) includes fixed effects for each of the three large banks (Rabobank, ING and ABN AMRO) and for each of the four mid-sized banks (Aegon, ASN, SNS Bank and Fortis Bank NL). The specification in column (3) includes fixed effects for each of the large banks only. The mixing distribution for the random coefficients is the normal distribution. The sample size is determined by the number of individuals and the alternatives in the individual choice sets.

rate is not significant in our main specification. We conclude that this restriction does not negatively affect consumer choice. Bonus interest payments on the highest balance within a quarter do not constitute a clear-cut restriction in the sense that consumers are always worse off in comparison to unrestricted accounts. Patient consumers might be rewarded, while consumers in need of liquidity might lose out when withdrawing funds, receiving on average a lower interest rate. *Product age* has the expected positive effect on consumer choice, indicating potential lock-in situations for customers.

Across our three chosen specifications, results are quite similar with regards to the sign of coefficients and statistical significance. However, the level of the two coefficients for the interest rate increases in the amount of fixed effects included. As previously discussed, bank fixed effects ought to be included in order to account for unobserved factors, such as service quality, which are potentially correlated with the interest rate and affecting consumer choice. In light of the differences between the estimates for the interest rate on which we base the demand-side calibration of the model, we select the specification, including all bank fixed effects for the calibration of the model. Subsuming a common fixed effect for fringe banks could ignore possible specializations such as, for example, a focus on sustainability (Triodos Bank).

Table 5 reports derived own-price elasticities averaged on the bank level for 2007 to 2009. Note that the signs are positive in our application, since an increase in the interest rate usually triggers an increase in demand for savings account products. Demand reactions are elastic such that increases in the interest rates entail a proportionally larger demand increase. The three large banks exhibit rather low elasticities, while some of the smaller fringe banks have quite large estimates for the own-price elasticity. The range of own price elasticities reflects different degrees of market power and funding requirements across banks. Larger banks seem to be able to price less aggressively, possibly due to alternative funding sources. Over time, elasticities seem to increase on average, which might be a result of lower interest rates generally leading to a movement on the aggregated demand curve to a higher elasticity area.

Illustrating cross-price elasticities and substitution patterns is more challenging. Each

Table 5: Own-price elasticities averaged by bank

	2007	2008	2009
Rabobank	1.620	1.191	1.808
ING Bank	1.617	1.898	2.314
ABN AMRO	1.344	1.847	3.375
SNS Bank	4.871	4.888	4.934
Fortis Bank	2.600	2.913	5.947
AEGON	3.825	6.032	5.131
Argenta	6.176	8.049	6.102
ASN Bank	3.888	3.864	2.990
AT Bank	6.163	8.231	4.938
Credit Europe Bank	8.191	11.48	5.905
DSB Bank	3.466	4.460	5.438
Friesland Bank	3.815	2.938	3.173
GarantiBank	4.808	8.893	6.424
Moneyou	-	-	10.14
NIBC Direct	-	12.66	10.19
OHRA	6.673	8.633	9.589
RegioBank	1.872	1.431	3.399
Robeco	1.915	1.512	1.221
Triodos Bank	2.573	1.784	4.150

Notes: This table displays the unweighted average of own-price elasticities by bank.

year the choice set consists of between 40 to 60 products, leading to a very large number of cross-price elasticities. To gain insight into the substitution patterns on the product level, we regress cross-price elasticities on similarity measures for the account restrictions employed in the demand-side estimation. The dummy variables take the value one if both account products have the same outcome in the respective account restriction, and take the value zero otherwise (e.g. if both accounts are *internet only* accounts [or both are not], the similarity dummy for *internet only* is one). Column 1 in Table A1 presents the results of an OLS regression on the similarity measures and a constant.[29] The average for cross-price elasticities is -0.069 (not in the table). The coefficients for the similarity measures for the restrictions *other*, *minimum amount*, and *internet only* are statistically significant and negative. Our intuition is that similar alternatives have increased switching activities between them (i.e. more negative cross-price elasticities). *Product age* has a positive

[29]Column 2 of Table A1 reports the results of an OLS regressions of own-price elasticities on product characteristics without a constant. The results show that interest rates are positively correlated with own-price elasticities, suggesting profit-maximizing behavior of the banks applying favorable prices to consumers where elasticities are high and vice versa.

sign potentially indicating that consumers tend to switch to newer products once they switch. The coefficient for the similarity measure for *bonus* is estimated positively and significantly. This seems counter-intuitive to how consumers considered products with a bonus feature similar. However, the coefficient is insignificant in the demand estimation (see Table 4), thus the product characteristic *bonus* is not necessarily decisive in the consumer decision. We conclude from these results that our model is capable of capturing heterogeneous reactions to changes in the interest rates predicting that consumers are more likely to switch to similar products.

5.2 Merger Simulation

Before applying the simulation procedure introduced in section 4, we comment on the backed-out expected net loan rates r_{net}^{2009}. Table 6 reports summary statistics by year and also displays the 'markups' defined as expected net loan rate minus interest rate. A higher expected net loan rate suggests that banks can realize higher returns on each euro deposited with them. The developments of mean and median reflect the course of the average interest rate as already seen in Figure 3. We observe some rather extreme values. Especially the negative expected net loan rates could hint at a different motivation for offering retail depository products such as cross-selling different services.

Table 6: Summary statistics of expected net loan rates and markups

	mean	sd	min	p10	p50	p90	max
2007							
Expected net loan rate	4.80	4.52	-6.58	2.73	4.30	8.27	23.68
Markup	1.89	4.42	-7.98	0.00	0.97	5.97	21.54
2008							
Expected net loan rate	5.68	6.46	-4.28	2.79	4.74	9.87	41.27
Markup	2.45	6.51	-5.68	0.00	0.76	7.57	38.77
2009							
Expected net loan rate	3.03	10.01	-67.28	2.38	4.00	6.24	20.11
Markup	0.23	9.85	-68.75	0.00	0.80	3.36	18.23

Notes: This table reports summary statistics of the backed-out expected net loan rates and respective markups by year.

Turning to the merger simulation, we present our results in Table 7. Column 1 displays simulated demand-weighted interest rate averages for 2010 for the case of joint ownership of ABN AMRO and Fortis Bank NL (merger). Column 2 analogously shows the results for the case of separate ownership of ABN AMRO and Fortis Bank NL (no merger). In both cases we use the backed-out expected net loan vector via data from 2009 which we keep constant in order to isolate the merger effect. In order to obtain weighted averages, we aggregate product-level interest rates on the bank level using actual market shares of the products from 2010 as weights. We use weighted interest rates to obtain a more realistic measure for the final effect on consumers and to prevent our predictions from being driven by account products with marginally small market shares. Results in column 3 present the predicted merger effects in percentage points reporting the difference in predictions from columns 1 and 2. For all banks, we predict negative merger effects with the highest effects for the two merging banks ABN AMRO and Fortis Bank NL. In terms of percent change (columns 4) ABN AMRO, on average, reduces interest rates by 3%, and Fortis Bank NL by 5%. An interesting result is that the model also predicts negative effects of about -1% for banks not directly involved in the merger, suggesting increased detrimental effects for consumers.

In column 5 we additionally report the realized demand-weighted interest rate averages for the end of 2010 to be able to assess the quality of our predictions. For a more comprehensive picture, we analogously present the product-level merger effects in Table A2. The root mean squared error (RMSE) of about 1 suggests that our predictions are, on average, one percentage point too high. However, this is a consequence of the focus on isolated competition effects. If we account for the changed monetary policy conditions, our predictions come closer to actual realizations (see robustness checks below).

Table 7: Predicted effects of the merger (2010)

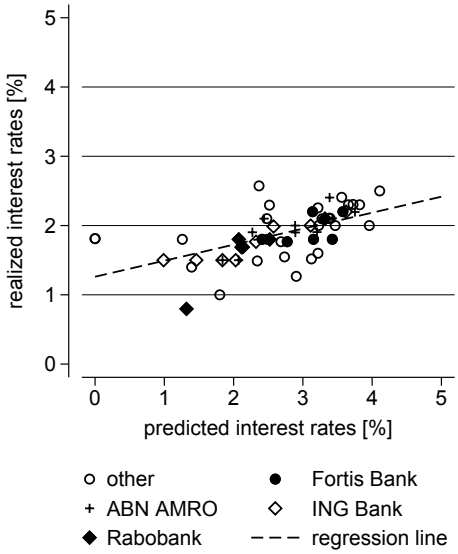
	merger interest rate	no-merger interest rate	merger effect perc. points	merger effect perc. change	realized interest rate
Fortis Bank	2.613	2.740	-0.127	-4.637	1.842
ABN AMRO	2.295	2.361	-0.066	-2.789	1.706
Triodos Bank	2.435	2.457	-0.022	-0.880	1.550
Friesland Bank	2.684	2.705	-0.022	-0.795	1.767
Rabobank	2.348	2.367	-0.018	-0.779	1.757
Argenta	3.218	3.241	-0.022	-0.693	2.255
NIBC Direct	3.819	3.844	-0.024	-0.626	2.300
AEGON	2.978	2.995	-0.017	-0.567	1.693
ING Bank	2.152	2.165	-0.012	-0.567	1.740
OHRA	3.633	3.653	-0.020	-0.549	2.130
AT Bank	3.002	3.018	-0.015	-0.508	1.378
SNS Bank	2.975	2.986	-0.011	-0.379	2.171
Credit Europe Bank	3.218	3.228	-0.010	-0.309	1.600
GarantiBank	3.228	3.238	-0.010	-0.309	2.000
RegioBank	3.658	3.668	-0.010	-0.276	2.300
RMSE					0.963

Notes: This table displays simulated demand-weighted interest rate averages on the bank level for 2010 for the case of joint ownership of ABN Amro and Fortis Bank NL (merger) in column 1 and for the case of separate ownership of the two banks (no merger) in column 2. In order to obtain weighted averages, we aggregate product-level interest rates using market shares as weights. Column 3 presents predicted merger effects on the bank level reporting the difference of predicted interest rates in the merger case in column 1, as well as predicted interest rates in the no-merger case in column 2 (in percentage points). Column 4 contains the respective percentage changes. Column 5 depicts the realized (demand weighted) interest rates at the end of 2010. RMSE is based on the difference between column 5 and 1. Simulation is based on pre-merger (constant) r_{net}.

Abstracting from the level differences, we attempt to assess the goodness of fit of our predictions based on their power to correctly predict the ranking in terms of interest rates. As a fist step, we plot the predicted interest rates for all savings accounts in the merger case against their realizations in 2010. Figure 5 shows that there is a positive relationship (correlation coefficient: 0.58). In addition, we rank predicted and realized interest rates by interest rates, respectively, and plot these ranks against each other. Figure 6 reveals that the main banks are close to the diagonal, suggesting that the general ranking is captured to an acceptable extent by our model. This is confirmed by the Spearman's rank correlation coefficient of 0.69. Computing the Spearman's rank correlation coefficient by bank yields coefficients ranging from 0.5 to 1. Thus, despite the level-deviations, our model yields a fair fit in terms of interest rate differences across savings accounts.

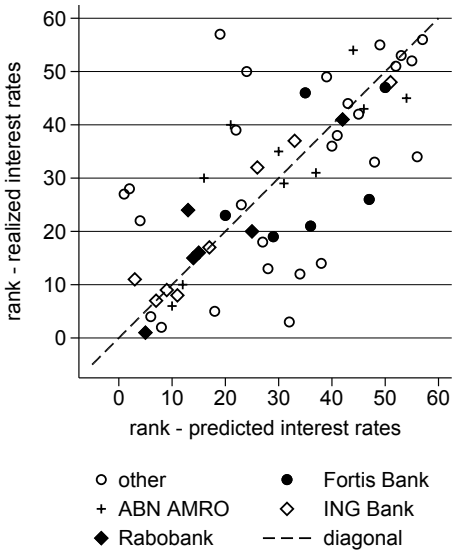
Taking a closer look at the merger effects on the individual savings accounts, we test

Figure 5: Quality of predicted merger interest rates



Notes: This figure plots the product-level predictions of interest rates from our merger simulation for the merger case using constant r_{net} against the realized interest rates in 2010 with distinction by main banks.

Figure 6: Quality of predicted merger interest rates – ranks



Notes: This figure plots the product-level ranks of predictions of interest rates from our merger simulation for the merger case using constant r_{net} against the ranks of realized interest rates in 2010 with distinction by main banks. Ranks increase with interest rate.

whether there are significant differences between the merging banks and the other banks. Table 8 shows in the first panel that the interest rate reductions are significantly stronger for the merging parties – regardless of whether measured in percentage or percentage points. In addition, we compute whether there are differences across similar products. On the one hand, we compare savings accounts with internet-only usage against others finding that these are more affected in terms of interest rate reductions (second panel). This is due to the fact that Fortis Bank NL only offered internet-managed savings accounts. On the other hand, we investigate how non-restricted accounts are affected. In the third panel, we find a indication that savings accounts without conditions exhibit lower interest rate reductions than their restricted counterparts.

Table 8: Interest rate effects of the merger by savings accounts (2010)

	Mean (1)	Obs. (2)	Mean (3)	Obs. (4)	two-tailed p of diff. (1)-(3)
Merging bank	*other*		*ABN or Fortis*		
Perc. change	-0.543	39	-2.544	16	0.000
Perc. point change	-0.014	39	-0.076	16	0.000
Internet-only usage	*No*		*Yes*		
Perc. change	-0.633	37	-2.135	18	0.000
Perc. point change	-0.016	37	-0.064	18	0.000
Any condition	*No*		*Yes*		
Perc. change	-0.663	16	-1.314	39	0.081
Perc. point change	-0.014	16	-0.039	39	0.025

Notes: This table shows how savings accounts are affected by the merger. It displays merger-induced changes in interest rate measured in percentage and in percentage points. The first panel distinguishes savings accounts from either one of the merging banks or from the other banks. The second and third panel distinguish savings accounts by internet-only usage and by the existence of any condition, respectively. Column 5 provides the p-value of a two-sided t test on the equality of means.

Aiming for predictions which better account for the changed conditions in the financial markets in 2010, we conduct three robustness checks. However, the merger effects are not solely attributable to reduced competition in these cases. As a first check, we reduce the backed-out expected net loan rates by the 0.4 percentage points decline of the 3-months Euribor from 2009 to 2010. Results are reported in Tables A3 (bank-wise) and A4 (product-wise). Judging from the RMSE, our predictions come closer to the realized

values. In terms of merger effects, we obtain similar reductions in interest rates of about 3% for ABN AMRO and 5% for Fortis Bank NL.

In contrast to simply assuming that the Euribor drop directly translates into expected net loan rates, we aim to establish an empirical relationship with the help of a regression using the pre-merger period 2007-2009. Regressing expected net loan rates on Euribor, savings account characteristics, and bank-year fixed effects, all of which capture the expected net loan rates at the bank level, we obtain a significant Euribor coefficient of about 1.12 (see Table A5). This suggests that a one percentage point increase in the Euribor has a stronger level-shifting effect than previously assumed. However, in terms of merger effects and prediction fit, we do not find very different results to the previous check (see Tables A6 and A7). This is certainly due to the fact that the corresponding adjustment of expected net loan rates is comparable to the previous check. (The drop in Euribor of 0.4 multiplied by the coefficient of 1.12 yields a comparable reduction.)

Finally, we repeat the previous check based on a longer-run empirical relationship between expected net loan rates and Euribor using the period 2007-2014. The magnitude of Euribor coefficient rises to 2.12 (see Table A8) which translates into a stronger decline of expected net loan rates used in the merger simulation. The merger effects thus turn out to be somewhat larger (4% for ABN AMRO and 6% for Fortis Bank NL), while the RMSE also reduces to 0.5 (see Tables A9 and A10). However, the computed reductions are now also partly attributable to the loosened monetary policy. In contrast, our initial analysis provides isolated merger effects stemming from reduced competition.

5.3 Welfare Effects

Our merger simulation hints at anti-competitive effects resulting from reduced interest rates. To put these effects into perspective, we relate the bank-level reductions to the amount of deposits that households made with the respective banks. We base our back-of-the-envelope consumer welfare analysis on a statistic of the Dutch central bank reporting a total of about 261 billion euros household deposits redeemable at notice in 2010 (year

average) for the entire Dutch market.[30] We break down the amount of total deposits by bank via our sample market shares from Table 2. These shares are fairly in line with the market description of the Dutch competition authority (ACM, 2014) reported for 2011.[31]

Based on the estimate of the savings amount that households deposited with the respective banks, their interest payments in 2010 would be reduced by about 69 million euros. Table 9 provides an overview of the consumer welfare loss by bank. The highest losses occur jointly at the merging banks (approximately 23 million euros for ABN AMRO consumers and 14 million euros for Fortis Bank NL consumers) but also Rabobank and ING consumers encounter losses of more than 14 and around 10 million euros, respectively. These large amounts are explained by their large market shares so that even low indirect merger effects impair the savings of their consumers.

Table 9: Consumer welfare effects of the merger (2010)

	total consumer welfare effects in mio euro
ABN AMRO	-22.612
Rabobank	-14.361
Fortis Bank	-13.621
ING Bank	-9.669
SNS Bank	-3.529
AEGON	-1.702
Friesland Bank	-1.503
OHRA	-0.677
NIBC Direct	-0.589
Argenta	-0.419
Triodos Bank	-0.277
AT Bank	-0.161
Credit Europe Bank	-0.105
RegioBank	-0.035
GarantiBank	-0.012
total	-69.259

Notes: This table displays bank-level consumer welfare effects derived by multiplication of the merger-induced interest rate difference with the total amount of household deposits redeemable at notice in 2010 by bank.

[30] See https://statistiek.dnb.nl/en/dashboards/household-savings/index.aspx, last accessed on October 24, 2019.

[31] Unfortunately, we were not able to obtain data on household deposits redeemable at notice by bank for 2010. DNB only reports bank-level figures starting from 2014.

In order to more thoroughly investigate the welfare effects, we make use of our consumer-level data and take a closer look at the consumers who are affected most by the merger-induced reductions in interest rates. In a first step we compare consumers of the merging banks to those of other banks. In the first panel of Table 10 we report the results of two-sided t test for different consumer characteristics. We do not find any significant differences regarding age, gender, education or savings amount. However, there is significant indication that consumers of ABN AMRO and Fortis Bank NL have a higher yearly income than the consumers of other banks (45,000 euros compared to 34,500 euros on average).

Furthermore, we compare consumers by the degree of interest rate reduction they face. In the second panel of Table 10 we contrast the characteristics of consumers having savings accounts with interest rate reduction in the upper 10th percentile (i.e. incurring a interest rate reduction of more than 3.4%) to less affected consumers. We do not observe a significant difference regarding age and gender; however, we find that more strongly affected consumers are less likely to have a university degree (8% as opposed to 15%) and also have a smaller amount of savings (12,400 euros versus 18,600 euros). We do not find a significant difference regarding income in this comparison.

Next, we distinguish among consumers based on the percentage point reduction they incur. Again, we compare consumers having savings accounts with reductions in the upper 10th percentile to others. This concerns consumers having savings accounts with reductions of more than 0.12 percentage points, which entails less consumers than before. With this distinction we find that the more strongly affected consumers have a significantly higher share of females and also a lower share of university degrees. When altering the distinction to the 20th percentile, we recover the finding of lower savings for the most affected customers, which is insignificant with the 10th-percentile distinction.

Summing up, our consumer-level welfare analysis suggests that less educated consumers with lower savings are more strongly affected by merger-induced reductions in interest rates. We keep in mind that each individual only carried a relatively small loss resulting from the merger-induced interest rate decreases. However, these income reducti-

ons might come at a higher individual cost in recessionary times as compared to normal times in the business cycle.

Table 10: Characteristics of consumers by exposure to affected savings accounts (2010)

	Mean (1)	Obs. (2)	Mean (3)	Obs. (4)	two-tailed p of diff. (1)-(3)
Distinction by banks	*other*		*ABN or Fortis*		
Age	52.91	1171	52.88	230	0.982
Female	0.45	1182	0.44	232	0.977
University degree	0.15	1182	0.13	232	0.478
Savings on savings accounts in EUR	18181.97	836	17856.83	167	0.833
Yearly gross earned income in EUR	34454.36	557	45001.04	101	0.005
Distinction by perc. change	*p90*		*p10*		
Age	53.07	1292	50.89	109	0.163
Female	0.44	1305	0.50	109	0.269
University degree	0.15	1305	0.08	109	0.056
Savings on savings accounts in EUR	18615.03	925	12350.21	78	0.003
Yearly gross earned income in EUR	35737.57	609	40244.90	49	0.378
Distinction by perc. points change	*p90*		*p10*		
Age	52.95	1342	51.80	59	0.580
Female	0.44	1355	0.56	59	0.071
University degree	0.15	1355	0.07	59	0.088
Savings on savings accounts in EUR	18219.74	963	15915.20	40	0.432
Yearly gross earned income in EUR	36341.51	629	30254.21	29	0.352

Notes: This table displays differences between consumers who are affected by the merger. The first panel distinguishes consumers among their choice of a savings account from either one of the merging banks or from the other banks. The second panel distinguishes among consumers who chose savings accounts that are most affected by merger-induced interest rate decreases. Most affected savings accounts are measured by percentage reduction in the 10th percentile. In the third panel most affected savings accounts are measured by percentage point decreases in the 10th percentile. Column 5 provides the p-value of a two-sided t test on the equality of means.

6 Conclusion

In this paper, we investigated the competition effects of the merger of ABN AMRO and Fortis Bank NL in the Dutch market for savings accounts in 2010. We employed structural industrial organization methodology to single out the competition effects of the merger from the generally lowered interest rate environment. Using consumer-level data, we obtained model predictions for the merger effect by simulating product-level interest rates for the two distinct cases of joint and separate ownership of the banks.

Our analysis suggests significant effects on interest rates in the market. ABN AMRO and Fortis Bank NL have 3% and 5% lower interest rates, respectively, as compared to the case of no merger. Our model also predicts interest declines for other market participants not directly involved in the merger. We calculate that total consumer welfare loss amounts to roughly 69 million euros in lost interest income (37 million euros for consumers of the merging banks). While this figure only relates to a short-term perspective, our consumer-level welfare analysis suggests that less educated consumers with lower savings are more strongly affected by merger-induced reductions in interest rates. Especially in recessionary times, even small income reductions might come at larger individual cost.

Our results point towards the need to heed of the additional social costs caused by reduced competition when merging banks for the sake of financial stability. We leave paths for future work that could focus on the long-term effects of the merger, which could be contrasted with realized synergies (ABN AMRO reports that the merger was completed in 2012). Potential shifts in the way how market participants compete with each other after large-scale state interventions might be included as well, as discussed at the example of price leadership bans. Further avenues for research comprise incorporating financial markets in the supply side in order to more thoroughly capture the benefits of financial stability by explicitly modeling the cost of financial distress and potential market exits.

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Appendix

Table A1: Correlations of elasticities

	cross-price	own-price
Other (both accounts)	-0.023***	
	(0.004)	
Minimum amount (both accounts)	-0.027***	
	(0.004)	
Bonus rate (both accounts)	0.027***	
	(0.004)	
Product age (same for both accounts)	0.020***	
	(0.005)	
Internet only (both accounts)	-0.094***	
	(0.004)	
Other		0.226
		(0.493)
Minimum amount		0.015
		(0.329)
Bonus rate		-0.817**
		(0.398)
Product age		-0.501***
		(0.057)
Internet only		-0.427
		(0.332)
Interest average		2.073***
		(0.102)
Observations	7824	154

* p<0.1, ** p<0.05, *** p<0.01

Notes: This table displays the results of different regressions of cross- and own-price elasticities on product characteristics similarity measures and product characteristics respectively using OLS and excluding a constant.

Table A2: Predicted effects of the merger (2010) – Product level

	merger interest rate	no-merger interest rate	merger effect perc. points	merger effect perc. change	realized interest rate
abnamro-beleggersspaarrekening	2.271	2.296	-0.025	-1.082	1.903
abnamro-bonusspaarrekeningspeciaal	2.440	2.464	-0.024	-0.984	2.100
abnamro-directkwartaalsparen	3.425	3.524	-0.099	-2.796	2.104
abnamro-directsparen	3.204	3.228	-0.024	-0.750	1.906
abnamro-groeigemakspaarrekening	1.841	1.876	-0.035	-1.869	1.500
abnamro-internetspaarrekening	2.072	2.185	-0.113	-5.191	1.500
abnamro-royaalrekening	2.888	2.912	-0.024	-0.824	2.000
abnamro-vermogensspaarrekening	3.386	3.410	-0.024	-0.713	2.404
abnamro-youngprofessionalspaarrekening	2.892	2.916	-0.024	-0.829	1.900
aegon-eigenstijlsparen	3.959	3.971	-0.011	-0.285	2.000
aegon-renterekening	1.801	1.815	-0.014	-0.788	1.000
aegon-spaarcomfort	3.395	3.405	-0.010	-0.305	2.100
aegon-sparen	2.735	2.757	-0.022	-0.791	1.547
argenta-internetspaarrekening	3.218	3.241	-0.022	-0.693	2.255
asn-ideaalsparen	3.724	3.736	-0.012	-0.313	2.305
asn-internetsparen	2.487	2.499	-0.011	-0.446	1.801
asn-optimaalbeleggen	2.518	2.529	-0.011	-0.441	2.294
asn-sparen	1.260	1.267	-0.007	-0.529	1.801
atb-internetspaarrekening	3.123	3.146	-0.022	-0.701	1.518
atb-spaarrekening	2.905	2.915	-0.010	-0.342	1.267
crediteurope-internetspaarrekening	3.218	3.228	-0.010	-0.309	1.600
fortisbank-bonusspaarrekening	2.774	2.904	-0.129	-4.454	1.767
fortisbank-ejaarspaarrekening	3.426	3.546	-0.120	-3.392	1.801
fortisbank-ekwartaalspaarrekening	3.140	3.265	-0.125	-3.814	2.200
fortisbank-eminentplusrekening	3.154	3.256	-0.103	-3.156	1.801
fortisbank-espaarextrarekening	3.578	3.697	-0.118	-3.200	2.200
fortisbank-espaarrekening	2.412	2.540	-0.128	-5.048	1.801
frieslandbank-internetspaarrekening	2.684	2.705	-0.022	-0.795	1.767
garantibank-goudeninternetrekening	3.384	3.394	-0.010	-0.296	2.107
garantibank-goudenklaverrekening	3.228	3.238	-0.010	-0.309	2.000
ingbank-bonusrenterekening	2.577	2.587	-0.011	-0.407	1.987
ingbank-comfortspaarrekening	1.461	1.472	-0.011	-0.729	1.500
ingbank-internetspaarrekening	2.030	2.052	-0.021	-1.048	1.500
ingbank-kwartaalextrarekening	2.324	2.334	-0.010	-0.449	1.767
ingbank-loyaalrekening	1.839	1.850	-0.010	-0.556	1.500
ingbank-plusrekening	0.989	1.000	-0.011	-1.065	1.500
ingbank-profijtrekening	3.623	3.633	-0.011	-0.292	2.200
ingbank-toprekening	3.112	3.123	-0.011	-0.339	2.000
moneyou-spaarrekening	3.752	3.852	-0.100	-2.607	2.196
nibc-internetspaarrekening	3.819	3.844	-0.024	-0.626	2.300
ohra-internetspaarrekening	3.467	3.490	-0.023	-0.671	2.000
ohra-maandspaarrekening	4.109	4.119	-0.010	-0.252	2.500
rabobank-groensparen	1.320	1.328	-0.008	-0.617	0.797
rabobank-internetbonussparen	2.521	2.547	-0.026	-1.020	1.800
rabobank-internetloyaalsparen	3.319	3.331	-0.012	-0.364	2.100
rabobank-raborendementrekening	2.075	2.089	-0.014	-0.647	1.801
rabobank-spaarrekening	2.115	2.128	-0.013	-0.627	1.688
regiobank-bonussparen	3.658	3.668	-0.010	-0.276	2.300
regiobank-extraplusrekening	1.394	1.400	-0.006	-0.431	1.400
regiobank-spaaropmaatvrij	2.367	2.377	-0.010	-0.421	2.573
robeco-roparco	2.133	2.146	-0.013	-0.618	1.689
snsbank-maxisparen	3.561	3.572	-0.012	-0.325	2.408
snsbank-snsinternetsparen	2.480	2.491	-0.011	-0.448	2.100
triodos-internetsparen	2.342	2.363	-0.022	-0.912	1.489
triodos-maandsparen	3.275	3.297	-0.022	-0.678	2.097
RMSE					0.963

Notes: This table displays simulated interest rate for 2010 for the case of joint ownership of ABN Amro and Fortis Bank NL (merger) in column 1 and for the case of separate ownership of the two banks (no merger) in column 2 on the product level. Column 3 presents predicted merger effects on the product level reporting the difference of predicted interest rates in the merger case in column 1 and predicted interest rates in the no-merger case in column 2. Column 4 contains the respective percentage changes. Column 5 depicts the realized interest rates at the end of 2010. RMSE is based on the difference between column 5 and 1. Simulation is based on pre-merger (constant) r_{net}.

Table A3: Predicted effects of the merger (2010) – robustness: r_{net} corrected by actual Euribor change

	merger interest rate	no-merger interest rate	merger effect perc. points	merger effect perc. change	realized interest rate
Fortis Bank	2.239	2.364	-0.125	-5.292	1.842
ABN AMRO	1.918	1.982	-0.064	-3.231	1.706
Triodos Bank	2.057	2.079	-0.021	-1.019	1.550
Rabobank	1.970	1.988	-0.018	-0.908	1.757
Friesland Bank	2.305	2.327	-0.021	-0.906	1.767
Argenta	2.841	2.863	-0.022	-0.768	2.255
NIBC Direct	3.443	3.467	-0.024	-0.680	2.300
ING Bank	1.767	1.779	-0.012	-0.675	1.740
AEGON	2.597	2.614	-0.017	-0.636	1.693
OHRA	3.254	3.274	-0.020	-0.599	2.130
AT Bank	2.619	2.634	-0.015	-0.570	1.378
SNS Bank	2.590	2.601	-0.011	-0.425	2.171
Credit Europe Bank	2.831	2.841	-0.010	-0.343	1.600
GarantiBank	2.841	2.851	-0.010	-0.343	2.000
RegioBank	3.271	3.281	-0.010	-0.302	2.300
RMSE					0.672

Notes: This table displays simulated demand-weighted interest rate averages on the bank level for 2010 for the case of joint ownership of ABN Amro and Fortis Bank NL (merger) in column 1 and for the case of separate ownership of the two banks (no merger) in column 2. In order to obtain weighted averages, we aggregate product-level interest rates using market shares as weights. Column 3 presents predicted merger effects on the bank level reporting the difference of predicted interest rates in the merger case in column 1, as well as predicted interest rates in the no-merger case in column 2 (in percentage points). Column 4 contains the respective percentage changes. Column 5 depicts the realized (demand weighted) interest rates at the end of 2010. RMSE is based on the difference between column 5 and 1. Simulation is based on pre-merger r_{net} corrected by actual Euribor change.

Table A4: Predicted effects of the merger (2010) – Product level – robustness: r_{net} corrected by actual Euribor change

	merger interest rate	no-merger interest rate	merger effect perc. points	merger effect perc. change	realized interest rate
abnamro-beleggersspaarrekening	1.886	1.910	-0.024	-1.263	1.903
abnamro-bonusspaarrekeningspeciaal	2.055	2.079	-0.024	-1.132	2.100
abnamro-directkwartaalsparen	3.052	3.148	-0.096	-3.040	2.104
abnamro-directsparen	2.819	2.842	-0.023	-0.825	1.906
abnamro-groeigemakspaarrekening	1.462	1.496	-0.034	-2.272	1.500
abnamro-internetspaarrekening	1.700	1.810	-0.111	-6.110	1.500
abnamro-royaalrekening	2.503	2.527	-0.023	-0.922	2.000
abnamro-vermogensspaarrekening	3.001	3.025	-0.024	-0.779	2.404
abnamro-youngprofessionalspaarrekening	2.507	2.530	-0.023	-0.927	1.900
aegon-eigenstijlsparen	3.574	3.585	-0.011	-0.308	2.000
aegon-renterekening	1.424	1.438	-0.014	-0.973	1.000
aegon-spaarcomfort	3.009	3.019	-0.010	-0.336	2.100
aegon-sparen	2.357	2.378	-0.021	-0.898	1.547
argenta-internetspaarrekening	2.841	2.863	-0.022	-0.768	2.255
asn-ideaalsparen	3.340	3.351	-0.011	-0.341	2.305
asn-internetsparen	2.102	2.113	-0.011	-0.516	1.801
asn-optimaalbeleggen	2.133	2.143	-0.011	-0.508	2.294
asn-sparen	0.866	0.872	-0.007	-0.751	1.801
atb-internetspaarrekening	2.746	2.767	-0.022	-0.780	1.518
atb-spaarrekening	2.518	2.528	-0.010	-0.385	1.267
crediteurope-internetspaarrekening	2.831	2.841	-0.010	-0.343	1.600
fortisbank-bonusspaarrekening	2.399	2.527	-0.127	-5.039	1.767
fortisbank-ejaarspaarrekening	3.052	3.170	-0.118	-3.723	1.801
fortisbank-ekwartaalspaarrekening	2.766	2.888	-0.122	-4.237	2.200
fortisbank-eminentplusrekening	2.769	2.870	-0.101	-3.526	1.801
fortisbank-espaarextrarekening	3.206	3.322	-0.116	-3.491	2.200
fortisbank-espaarrekening	2.037	2.163	-0.126	-5.839	1.801
frieslandbank-internetspaarrekening	2.305	2.327	-0.021	-0.906	1.767
garantibank-goudeninternetrekening	2.998	3.007	-0.010	-0.326	2.107
garantibank-goudenklaverrekening	2.841	2.851	-0.010	-0.343	2.000
ingbank-bonusrenterekening	2.191	2.201	-0.010	-0.467	1.987
ingbank-comfortspaarrekening	1.070	1.080	-0.010	-0.971	1.500
ingbank-internetspaarrekening	1.657	1.678	-0.021	-1.257	1.500
ingbank-kwartaalextrarekening	1.938	1.948	-0.010	-0.526	1.767
ingbank-loyaalrekening	1.457	1.467	-0.010	-0.686	1.500
ingbank-plusrekening	0.600	0.610	-0.010	-1.705	1.500
ingbank-profijtrekening	3.237	3.247	-0.010	-0.319	2.200
ingbank-toprekening	2.726	2.737	-0.010	-0.378	2.000
moneyou-spaarrekening	3.379	3.477	-0.097	-2.801	2.196
nibc-internetspaarrekening	3.443	3.467	-0.024	-0.680	2.300
ohra-internetspaarrekening	3.090	3.113	-0.023	-0.737	2.000
ohra-maandspaarrekening	3.723	3.733	-0.010	-0.272	2.500
rabobank-groensparen	0.928	0.936	-0.008	-0.856	0.797
rabobank-internetbonussparen	2.148	2.173	-0.025	-1.172	1.800
rabobank-internetloyaalsparen	2.935	2.947	-0.012	-0.403	2.100
rabobank-raborendementrekening	1.694	1.707	-0.013	-0.774	1.801
rabobank-spaarrekening	1.733	1.746	-0.013	-0.747	1.688
regiobank-bonussparen	3.271	3.281	-0.010	-0.302	2.300
regiobank-extraplusrekening	0.998	1.004	-0.006	-0.587	1.400
regiobank-spaaropmaatvrij	1.981	1.991	-0.010	-0.492	2.573
robeco-roparco	1.751	1.764	-0.013	-0.735	1.689
snsbank-maxisparen	3.176	3.187	-0.011	-0.356	2.408
snsbank-snsinternetsparen	2.095	2.106	-0.011	-0.518	2.100
triodos-internetsparen	1.964	1.985	-0.021	-1.063	1.489
triodos-maandsparen	2.898	2.920	-0.022	-0.750	2.097
RMSE					0.672

Notes: This table displays simulated interest rate for 2010 for the case of joint ownership of ABN Amro and Fortis Bank NL (merger) in column 1 and for the case of separate ownership of the two banks (no merger) in column 2 on the product level. Column 3 presents predicted merger effects on the product level reporting the difference of predicted interest rates in the merger case in column 1 and predicted interest rates in the no-merger case in column 2. Column 4 contains the respective percentage changes. Column 5 depicts the realized interest rates at the end of 2010. RMSE is based on the difference between column 5 and 1. Simulation is based on pre-merger r_{net} corrected by actual Euribor change.

Table A5: Expected loan rate estimates: pre-merger period

	(1)
Internet only	1.573
	(2.072)
Condition: Minimum amount	1.431
	(3.072)
Condition: Bonus rate	-1.544
	(2.699)
Condition: Other	-1.788
	(1.969)
3-months Euribor (yearly average)	1.115***
	(0.410)
Observations	154
R^2	0.387

* p<0.1, ** p<0.05, *** p<0.01

Notes: This table displays the results of an OLS regression of the backed-out expected loan rate estimates on product characteristics. Bank-year fixed effects are included but not reported. They capture bank-level averages by year. Standard errors are clustered at the account level and displayed in parentheses.

Table A6: Predicted effects of the merger (2010) – robustness: r_{net} corrected by Euribor change from pre-merger period regression

	merger interest rate	no-merger interest rate	merger effect perc. points	merger effect perc. change	realized interest rate
Fortis Bank	2.176	2.301	-0.125	-5.422	1.842
ABN AMRO	1.855	1.919	-0.064	-3.322	1.706
Triodos Bank	1.995	2.016	-0.021	-1.048	1.550
Rabobank	1.907	1.925	-0.018	-0.934	1.757
Friesland Bank	2.243	2.264	-0.021	-0.927	1.767
Argenta	2.778	2.800	-0.022	-0.783	2.255
ING Bank	1.703	1.715	-0.012	-0.698	1.740
NIBC Direct	3.381	3.404	-0.023	-0.690	2.300
AEGON	2.534	2.551	-0.017	-0.650	1.693
OHRA	3.191	3.211	-0.020	-0.609	2.130
AT Bank	2.556	2.571	-0.015	-0.582	1.378
SNS Bank	2.526	2.537	-0.011	-0.434	2.171
Credit Europe Bank	2.767	2.777	-0.010	-0.350	1.600
GarantiBank	2.777	2.786	-0.010	-0.349	2.000
RegioBank	3.207	3.217	-0.010	-0.306	2.300
RMSE					0.633

Notes: This table displays simulated demand-weighted interest rate averages on the bank level for 2010 for the case of joint ownership of ABN Amro and Fortis Bank NL (merger) in column 1 and for the case of separate ownership of the two banks (no merger) in column 2. In order to obtain weighted averages, we aggregate product-level interest rates using market shares as weights. Column 3 presents predicted merger effects on the bank level reporting the difference of predicted interest rates in the merger case in column 1, as well as predicted interest rates in the no-merger case in column 2 (in percentage points). Column 4 contains the respective percentage changes. Column 5 depicts the realized (demand weighted) interest rates at the end of 2010. RMSE is based on the difference between column 5 and 1. Simulation is based on pre-merger r_{net} corrected by Euribor change from pre-merger regression.

Table A7: Predicted effects of the merger (2010) – Product level – robustness: r_{net} corrected by Euribor change from pre-merger period regression

	merger interest rate	no-merger interest rate	merger effect perc. points	merger effect perc. change	realized interest rate
abnamro-beleggersspaarrekening	1.822	1.846	-0.024	-1.300	1.903
abnamro-bonusspaarrekeningspeciaal	1.991	2.015	-0.023	-1.163	2.100
abnamro-directkwartaalsparen	2.990	3.085	-0.095	-3.086	2.104
abnamro-directsparen	2.755	2.778	-0.023	-0.840	1.906
abnamro-groeigemakspaarrekening	1.399	1.433	-0.034	-2.360	1.500
abnamro-internetspaarrekening	1.638	1.748	-0.110	-6.301	1.500
abnamro-royaalrekening	2.440	2.463	-0.023	-0.941	2.000
abnamro-vermogensspaarrekening	2.937	2.961	-0.023	-0.792	2.404
abnamro-youngprofessionalspaarrekening	2.443	2.466	-0.023	-0.946	1.900
aegon-eigenstijlsparen	3.510	3.521	-0.011	-0.312	2.000
aegon-renterekening	1.361	1.375	-0.014	-1.013	1.000
aegon-spaarcomfort	2.945	2.955	-0.010	-0.342	2.100
aegon-sparen	2.294	2.316	-0.021	-0.919	1.547
argenta-internetspaarrekening	2.778	2.800	-0.022	-0.783	2.255
asn-ideaalsparen	3.276	3.287	-0.011	-0.346	2.305
asn-internetsparen	2.038	2.049	-0.011	-0.530	1.801
asn-optimaalbeleggen	2.069	2.079	-0.011	-0.522	2.294
asn-sparen	0.800	0.807	-0.007	-0.809	1.801
atb-internetspaarrekening	2.683	2.705	-0.022	-0.796	1.518
atb-spaarrekening	2.454	2.464	-0.010	-0.394	1.267
crediteurope-internetspaarrekening	2.767	2.777	-0.010	-0.350	1.600
fortisbank-bonusspaarrekening	2.337	2.464	-0.127	-5.153	1.767
fortisbank-ejaarspaarrekening	2.990	3.108	-0.118	-3.786	1.801
fortisbank-ekwartaalspaarrekening	2.704	2.826	-0.122	-4.318	2.200
fortisbank-eminentplusrekening	2.705	2.806	-0.101	-3.597	1.801
fortisbank-espaarextrarekening	3.144	3.259	-0.116	-3.546	2.200
fortisbank-espaarrekening	1.974	2.100	-0.126	-5.998	1.801
frieslandbank-internetspaarrekening	2.243	2.264	-0.021	-0.927	1.767
garantibank-goudeninternetrekening	2.933	2.943	-0.010	-0.332	2.107
garantibank-goudenklaverrekening	2.777	2.786	-0.010	-0.349	2.000
ingbank-bonusrenterekening	2.127	2.137	-0.010	-0.479	1.987
ingbank-comfortspaarrekening	1.005	1.015	-0.010	-1.029	1.500
ingbank-internetspaarrekening	1.595	1.616	-0.021	-1.301	1.500
ingbank-kwartaalextrarekening	1.874	1.884	-0.010	-0.542	1.767
ingbank-loyaalrekening	1.394	1.404	-0.010	-0.714	1.500
ingbank-plusrekening	0.535	0.546	-0.010	-1.900	1.500
ingbank-profijtrekening	3.173	3.183	-0.010	-0.324	2.200
ingbank-toprekening	2.662	2.673	-0.010	-0.385	2.000
moneyou-spaarrekening	3.318	3.415	-0.097	-2.837	2.196
nibc-internetspaarrekening	3.381	3.404	-0.023	-0.690	2.300
ohra-internetspaarrekening	3.028	3.051	-0.023	-0.750	2.000
ohra-maandspaarrekening	3.658	3.668	-0.010	-0.275	2.500
rabobank-groensparen	0.863	0.871	-0.008	-0.916	0.797
rabobank-internetbonussparen	2.086	2.111	-0.025	-1.202	1.800
rabobank-internetloyaalsparen	2.871	2.883	-0.012	-0.410	2.100
rabobank-raborendementrekening	1.630	1.644	-0.013	-0.800	1.801
rabobank-spaarrekening	1.670	1.683	-0.013	-0.772	1.688
regiobank-bonussparen	3.207	3.217	-0.010	-0.306	2.300
regiobank-extraplusrekening	0.933	0.939	-0.006	-0.626	1.400
regiobank-spaaropmaatvrij	1.917	1.927	-0.010	-0.506	2.573
robeco-roparco	1.687	1.700	-0.013	-0.760	1.689
snsbank-maxisparen	3.112	3.124	-0.011	-0.361	2.408
snsbank-snsinternetsparen	2.031	2.042	-0.011	-0.532	2.100
triodos-internetsparen	1.901	1.922	-0.021	-1.094	1.489
triodos-maandsparen	2.835	2.857	-0.022	-0.764	2.097
RMSE					0.633

Notes: This table displays simulated interest rate for 2010 for the case of joint ownership of ABN Amro and Fortis Bank NL (merger) in column 1 and for the case of separate ownership of the two banks (no merger) in column 2 on the product level. Column 3 presents predicted merger effects on the product level reporting the difference of predicted interest rates in the merger case in column 1 and predicted interest rates in the no-merger case in column 2. Column 4 contains the respective percentage changes. Column 5 depicts the realized interest rates at the end of 2010. RMSE is based on the difference between column 5 and 1. Simulation is based on pre-merger r_{net} corrected by Euribor change from pre-merger regression.

Table A8: Expected loan rate estimates: full period

	(1)
Internet only	1.914
	(1.403)
Condition: Minimum amount	-0.170
	(2.151)
Condition: Bonus rate	-1.719
	(1.994)
Condition: Other	-1.588
	(1.395)
3-months Euribor (yearly average)	2.119***
	(0.536)
Observations	388
R^2	0.418

* p<0.1, ** p<0.05, *** p<0.01

Notes: This table displays the results of an OLS regression of the backed out expected loan rate estimates on product characteristics using the full period 2007-2014. Bank-year fixed effects are included but not reported. They capture bank-level averages by year. Standard errors are clustered at the account level and displayed in parentheses.

Table A9: Predicted effects of the merger (2010) – robustness: r_{net} corrected by Euribor change from full period regression

	merger interest rate	no-merger interest rate	merger effect perc. points	merger effect perc. change	realized interest rate
Fortis Bank	1.784	1.907	-0.123	-6.433	1.842
ABN AMRO	1.461	1.523	-0.062	-4.063	1.706
Triodos Bank	1.600	1.620	-0.021	-1.275	1.550
Rabobank	1.511	1.529	-0.018	-1.149	1.757
Friesland Bank	1.847	1.868	-0.021	-1.100	1.767
Argenta	2.383	2.405	-0.021	-0.891	2.255
ING Bank	1.300	1.312	-0.012	-0.891	1.740
NIBC Direct	2.987	3.010	-0.023	-0.763	2.300
AEGON	2.136	2.152	-0.016	-0.753	1.693
OHRA	2.795	2.814	-0.019	-0.679	2.130
AT Bank	2.156	2.170	-0.015	-0.673	1.378
SNS Bank	2.123	2.134	-0.011	-0.504	2.171
Credit Europe Bank	2.363	2.372	-0.009	-0.400	1.600
GarantiBank	2.372	2.382	-0.009	-0.399	2.000
RegioBank	2.803	2.812	-0.010	-0.342	2.300
RMSE					0.513

Notes: This table displays simulated demand-weighted interest rate averages on the bank level for 2010 for the case of joint ownership of ABN Amro and Fortis Bank NL (merger) in column 1 and for the case of separate ownership of the two banks (no merger) in column 2. In order to obtain weighted averages, we aggregate product-level interest rates using market shares as weights. Column 3 presents predicted merger effects on the bank level reporting the difference of predicted interest rates in the merger case in column 1, as well as predicted interest rates in the no-merger case in column 2 (in percentage points). Column 4 contains the respective percentage changes. Column 5 depicts the realized (demand weighted) interest rates at the end of 2010. RMSE is based on the difference between column 5 and 1. Simulation is based on pre-merger r_{net} corrected by Euribor change from full period regression.

Table A10: Predicted effects of the merger (2010) – Product level – robustness: r_{net} corrected by Euribor change from full period regression

	merger interest rate	no-merger interest rate	merger effect perc. points	merger effect perc. change	realized interest rate
abnamro-beleggersspaarrekening	1.420	1.444	-0.023	-1.611	1.903
abnamro-bonusspaarrekeningspeciaal	1.589	1.612	-0.023	-1.408	2.100
abnamro-directkwartaalsparen	2.600	2.692	-0.092	-3.427	2.104
abnamro-directsparen	2.352	2.375	-0.023	-0.950	1.906
abnamro-groeigemakspaarrekening	1.003	1.036	-0.033	-3.157	1.500
abnamro-internetspaarrekening	1.249	1.356	-0.107	-7.903	1.500
abnamro-royaalrekening	2.037	2.059	-0.022	-1.090	2.000
abnamro-vermogensspaarrekening	2.535	2.558	-0.023	-0.886	2.404
abnamro-youngprofessionalspaarrekening	2.040	2.063	-0.023	-1.095	1.900
aegon-eigenstijlsparen	3.106	3.117	-0.011	-0.344	2.000
aegon-renterekening	0.967	0.981	-0.014	-1.387	1.000
aegon-spaarcomfort	2.541	2.551	-0.010	-0.386	2.100
aegon-sparen	1.899	1.920	-0.021	-1.084	1.547
argenta-internetspaarrekening	2.383	2.405	-0.021	-0.891	2.255
asn-ideaalsparen	2.874	2.885	-0.011	-0.385	2.305
asn-internetsparen	1.636	1.646	-0.011	-0.644	1.801
asn-optimaalbeleggen	1.666	1.677	-0.011	-0.632	2.294
asn-sparen	0.388	0.395	-0.006	-1.613	1.801
atb-internetspaarrekening	2.288	2.309	-0.021	-0.911	1.518
atb-spaarrekening	2.050	2.059	-0.009	-0.460	1.267
crediteurope-internetspaarrekening	2.363	2.372	-0.009	-0.400	1.600
fortisbank-bonusspaarrekening	1.945	2.070	-0.125	-6.033	1.767
fortisbank-ejaarspaarrekening	2.600	2.715	-0.115	-4.247	1.801
fortisbank-ekwartaalspaarrekening	2.313	2.433	-0.120	-4.925	2.200
fortisbank-eminentplusrekening	2.302	2.401	-0.099	-4.133	1.801
fortisbank-espaarextrarekening	2.754	2.867	-0.113	-3.947	2.200
fortisbank-espaarrekening	1.582	1.706	-0.124	-7.267	1.801
frieslandbank-internetspaarrekening	1.847	1.868	-0.021	-1.100	1.767
garantibank-goudeninternetrekening	2.529	2.539	-0.010	-0.375	2.107
garantibank-goudenklaverrekening	2.372	2.382	-0.009	-0.399	2.000
ingbank-bonusrenterekening	1.723	1.733	-0.010	-0.577	1.987
ingbank-comfortspaarrekening	0.595	0.605	-0.010	-1.684	1.500
ingbank-internetspaarrekening	1.204	1.225	-0.021	-1.681	1.500
ingbank-kwartaalextrarekening	1.471	1.480	-0.010	-0.673	1.767
ingbank-loyaalrekening	0.994	1.004	-0.010	-0.974	1.500
ingbank-plusrekening	0.128	0.139	-0.010	-7.307	1.500
ingbank-profijtrekening	2.769	2.779	-0.010	-0.362	2.200
ingbank-toprekening	2.259	2.269	-0.010	-0.443	2.000
moneyou-spaarrekening	2.928	3.022	-0.094	-3.100	2.196
nibc-internetspaarrekening	2.987	3.010	-0.023	-0.763	2.300
ohra-internetspaarrekening	2.634	2.657	-0.022	-0.842	2.000
ohra-maandspaarrekening	3.254	3.264	-0.010	-0.302	2.500
rabobank-groensparen	0.452	0.460	-0.008	-1.692	0.797
rabobank-internetbonussparen	1.695	1.720	-0.025	-1.443	1.800
rabobank-internetloyaalsparen	2.470	2.481	-0.012	-0.465	2.100
rabobank-raborendementrekening	1.232	1.244	-0.013	-1.032	1.801
rabobank-spaarrekening	1.270	1.283	-0.013	-0.988	1.688
regiobank-bonussparen	2.803	2.812	-0.010	-0.342	2.300
regiobank-extraplusrekening	0.519	0.525	-0.006	-1.091	1.400
regiobank-spaaropmaatvrij	1.513	1.522	-0.010	-0.625	2.573
robeco-roparco	1.288	1.301	-0.013	-0.970	1.689
snsbank-maxisparen	2.710	2.721	-0.011	-0.405	2.408
snsbank-snsinternetsparen	1.628	1.639	-0.011	-0.647	2.100
triodos-internetsparen	1.506	1.527	-0.021	-1.348	1.489
triodos-maandsparen	2.440	2.462	-0.021	-0.867	2.097
RMSE					0.513

Notes: This table displays simulated interest rate for 2010 for the case of joint ownership of ABN Amro and Fortis Bank NL (merger) in column 1 and for the case of separate ownership of the two banks (no merger) in column 2 on the product level. Column 3 presents predicted merger effects on the product level reporting the difference of predicted interest rates in the merger case in column 1 and predicted interest rates in the no-merger case in column 2. Column 4 contains the respective percentage changes. Column 5 depicts the realized interest rates at the end of 2010. RMSE is based on the difference between column 5 and 1. Simulation is based on pre-merger r_{net} corrected by Euribor change from full period regression.

Table A11: Summary statistics: demographics

	mean	sd	min	max	count
2007					
Age	48	16	16	92	1,379
Female	.47	.5	0	1	1,402
Number of children	.8	1.1	0	5	1,398
University degree	.12	.33	0	1	1,402
Yearly gross earned income in EUR	31,543	28,459	10	490,000	724
Savings on savings accounts in EUR	13,883	15,828	1	50,000	1,003
2008					
Age	51	16	16	93	1,271
Female	.45	.5	0	1	1,274
Number of children	.78	1.1	0	6	1,273
University degree	.13	.34	0	1	1,274
Yearly gross earned income in EUR	32,247	20,683	16	200,000	633
Savings on savings accounts in EUR	15,189	16,377	1	50,000	963
2009					
Age	51	16	16	94	1,371
Female	.44	.5	0	1	1,373
Number of children	.76	1.1	0	5	1,369
University degree	.13	.34	0	1	1,373
Yearly gross earned income in EUR	33,246	26,605	27	450,000	642
Savings on savings accounts in EUR	15,418	16,058	1	50,000	978
2010					
Age	53	16	16	88	1,404
Female	.44	.5	0	1	1,417
Number of children	.68	1.1	0	6	1,415
University degree	.14	.35	0	1	1,417
Yearly gross earned income in EUR	36,405	34,472	150	600,000	657
Savings on savings accounts in EUR	18,427	18,183	1	50,000	990

Notes: This table displays summary statistics on selected variables regarding demographics by year.

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