

Political exit barriers in banking: Evidence on unleashing profitability potential from German county reforms*

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Abstract

We test if political barriers hamper Schumpeterian destruction in banking. Our identification strategy exploits exogenous shocks to the governance structure of local government-owned banks. We compare the effect of private and government-owned bank exits due to mergers in the wake of reforming political entities, namely counties. The latter own local savings, but not local private banks. Bank exits that are induced by a reduction of political frictions – fewer owners of local savings banks following county consolidation – enhance profitability. This improvement originates mostly from increasing risk in terms of lower capitalization. Other, less important drivers are mild labor cost efficiency improvements and moderate increases of interest income from both higher margins and loan volumes.

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1 Introduction

A widely noticed report by the European Systemic Risk Board (ESRB, 2014) voiced strong concerns that Europe is overbanked. Excess capacities would explain why profits remain notoriously low, which in turn might even jeopardize financial stability (ECB, 2016, 2017; EBA, 2017). So why do we observe so few banks that exit the industry? And is it indeed the absence of such Schumpeterian destruction in banking, which impedes profitability?

This paper tests if political frictions obstruct the industrial dynamics in the banking sector called for by policy makers. Basic finance theory predicts that the threat of outside investors to acquire inefficiently managed assets – financial or non-financial ones – suffices to discipline managers so as to act in the interest of shareholders (Manne, 1965; Jensen and Meckling, 1976). But if these control mechanisms are subject to frictions – say pervasive government ownership – factor allocation is inefficient and too few unproductive firms exit, thereby contributing to excess capacities and sluggish technology adoption (Jensen, 1993; Tinn, 2010; Titman, 2013).

Especially European banking systems are characterized by equity and other financial markets that play a very limited role to impose managerial discipline (de Haan and Vlahu, 2016). Hostile and cross-border takeovers are virtually absent in the European banking industry (DeYoung et al., 2009). And an already fairly weak capital market governance mechanism to force the exit of unproductive entities has been further undermined after the Great Financial Crisis of 2007/2008 and the Sovereign Debt crisis in the Eurozone in 2010. Pervasive nationalization waves (Bosma et al., 2016) paired with increasingly large holdings of sovereign debt by national banking systems (Acharya et al., 2015) increased both the direct as well the indirect reciprocal dependence between governments and “their” banking systems. Therefore, we conjecture that a more pronounced involvement of the government in banking causally deters bank exits, thereby giving rise to ineffective market structures that are associated with weak profitability.

The main challenge to identify whether government involvement poses an impediment to inefficient bank attrition is the innate unobservability of non-occurring exits: by definition, a non-event. We therefore use a novel strategy to isolate a causal mechanism how political frictions impede industrial dynamics. Specifically, our approach exploits that savings banks are forced to merge if their county of residence is merged with another one during an according regional reform. We test if those bank exits that occur once the shelter from consolidation pressure in the form of government ownership disappears, exhibit significantly different post-merger

performance. Significantly improved performance would indicate a more efficient allocation of resources by the bank compared to the situation prior to county reforms when the regional market was protected. Thus, we contrast sharply with the abundant literature on the role of political ties to receive government support of some kind that might impede creative destruction (such as, e.g., Brown and Dinç, 2005; Duchin and Sosyura, 2012; Dam and Koetter, 2012; Behn et al., 2015). Our identification strategy relies instead on exogenous shifts in the government ownership of some local banks during non-crisis times that reveal the conventionally missing counterfactual of banks leaving the market.

Ownership shifts emerge in our quasi-experimental setting from the fact that local savings banks are the property of the regional government where they reside, usually one of the 402 counties (“Kreise”) nested in the 16 federal states of the Republic of Germany. Savings bank laws (“Sparkassengesetze”) are issued by the state and stipulate besides county ownership that local savings banks are *de jure* not allowed to operate outside “their” regional market. During our sample period from 1993 until 2015, the number of counties declined drastically from 542 to 402. Importantly, these county mergers are decided upon at the level of the *state* – usually for administrative efficiency reasons – and represent as such an exogenous ownership shock to the *counties* that own the savings banks.¹ The latter are required by law to merge after the unification of counties. Put differently, these mergers are forced upon the involved savings bank very much like raider investors take control of inefficiently managed assets in a frictionless market for corporate control.

Our focus is thus on mergers as the exit event of interest, thereby also accounting for the fact that banks rarely exit markets due to outright insolvencies or voluntary closure during recessions or sector-specific shocks as is common for non-financial sectors.² To answer the question whether government involvement in banking is a significant roadblock to sustainable profits in banking, we then use a difference-in-difference model that explains post-merger bank performance according to three main comparisons. First, we only consider reformed counties within which we compare savings to cooperative banks that are not subject to government

¹Note that county consolidation does not reflect a gerrymandering process ignited by governing parties to maximize their odds of re-election.

²Caballero and Hammour (1994, 1996) provide theoretical evidence on the importance of firm exits to foster the re-allocation of production factors in particular during recessions when switching cost in the labor market are lower. A number of empirical firm- and plant-level studies show indeed that besides spurring investment, especially the exit of unproductive units is crucial for aggregate output and productivity growth, see for example Baden-Fuller (1989) on the UK Steel Casting industry, Petrin and Levinsohn (2012) for plant data of Chilean manufacturers, or Foster et al. (2006) for the U.S. retail sector.

involvement.³ Second, we compare merging local savings with merging cooperative banks in both reformed and unreformed counties. Third, we compare merging banks to non-merging banks across reformed and unreformed counties.

We estimate an economically and statistically large increase in the post-merger profitability of government-owned savings banks, if the merger was induced by a reform of the counties where these banks were residing. Depending on the reference group – private bank mergers in reform counties, any merging bank, or all non-merging banks – we find an increase in the return on gross equity (RoE) ranging between 3.8 and 5.7 percentage points. Against the backdrop of mean RoE around 8% in our sample, this effect is economically large.

The decomposition of this profitability development reveals that the RoE improvements are mainly driven by a decline in capitalization. Also credit risk increases as reflected by slightly larger non-performing loan ratios and lower loan-loss provisioning. Profits improve as well, mostly due to larger interest revenues that reflect larger realized markups of the merged entity in its local market. We do not detect, in turn, huge cost efficiency gains. Whereas the number of full-time equivalents (FTE) per branch declines after county-reform induced savings bank mergers, the differential effects on both the absolute number of FTE as well as the wage bill are positive. The headline result is robust to alternative evaluation windows around mergers, robust estimation methods accounting for potential serial correlation of performance, matched sampling of merging banks, randomized treatment of mergers with placebo county reforms, and explicitly accounting for distressed mergers and observable differences in the strengths of political ties.

Our paper connects several strands in the literature. First, we complement studies investigating the performance implications of government ownership in banking. Many studies that are based on pre-crisis data report undesirable effects, such as preferred bailout treatment (Behn et al., 2015), political lending (Sapienza, 2004; Halling et al., 2016), especially around elections (Gropp and Saadi, 2015; Englmaier and Stowasser, 2017), and ultimately a poor fulfillment of banks' role as delegated monitors of corporate lending and guardian of corporate managers discipline (Berger et al., 2005a; Ivashina et al., 2009) that deters economic growth (La Porta et al., 2002). In response to the Great Financial Crisis, governments around the globe systematically prevented bank exits by injecting equity (Duchin and Sosyura, 2012), which gives rise to a

³These so-called Volks- and Raiffeisenbanks are comparable in size to local savings banks and adhere as well to self-imposed regional market demarcation.

plethora of subsequent effects that further impede “natural” forces of competition to guide entry and exit into the industry.⁴ But whereas large and quick U.S. support of banks was followed by an equally rapid retreat of the government from its banking system (Hoshi and Kashyap, 2010; Calomiris and Khan, 2015), the German system remains characterized by a continuously large share of government ownership in banking. Rather than focusing on the effect of government interventions and ownership on bank performance as such, our paper is thus the first to test more directly if unleashing potential impediments to consolidation due to government ownership induced indeed market exits through mergers that subsequently enhanced bank performance.

Second, our study speaks to literature on the corporate governance of banks in general and the role of mergers and acquisition (M&A) in particular. An important insight from the deregulation wave in the United States was that overall the elimination of competitive hurdles enhanced technology adoption and competitive pressure in the banking industry, which in turn increased individual bank efficiency and shaped market structure towards a more concentrated and profitable banking system (Berger and Mester, 2003; Stiroh and Strahan, 2003). But stronger shareholder rights are no panacea to better governance and subsequent bank performance. Beltratti and Stulz (2012) document for a cross-country sample that those banks managed by boards that are more shareholder-friendly exhibited in fact worse performance during and after the Great Financial Crisis of 2007/2008. And Morck et al. (2011) report for Korean banks that it might not be government-ownership per se that leads to poor bank governance – and consequently performance – but other concentrated control rights, such as family or tycoon influence. Prior studies on German bank mergers yield fairly mixed results regarding subsequent performance developments, often failing to report efficiency or profitability gains (Lang and Welzel, 1999; Koetter et al., 2007; Koetter, 2008; Behr and Heid, 2011). These studies, however, fail to identify causal reasons why banks merged to begin with. If banks’ performances co-determined a merger in the first place, any post-merger comparison of performance is subject to a selection bias and possibly reverse causality. Our paper sharpens insights into the governance of banks literature, because we exploit a clearly exogenous rupture of potentially manager-benign (government) ownership structures and are able to isolate performance difference to an otherwise identical set of merging banks.

Third, most prior studies of the governance effects of M&A’s are confined by definition to

⁴See, for example, Gropp et al. (2011) on the erosion of competition due to bank bailouts in Europe and Duchin and Sosyura (2014) and Dam and Koetter (2012), respectively, on additional risk taking due to the moral hazard exerted by government bailouts of banks.

transactions in free markets for corporate control, where more efficiently managed banks identify weak competitors as targets (Hannan and Rhoades, 1987; Wheelock and Wilson, 2000). In the presence of agency-problems, bank managers might be inclined to engage in mergers even though they are not value enhancing, for example, if CEO compensation depends on bank size (Bliss and Rosen, 2001) or CEOs overestimate their ability to manage the merged bank (Roll, 1986). Our study of regional banks run by managers that are prohibited (and protected) by law to merge at will, thereby helps to exclude a plethora of potentially rivaling merger motives in free capital markets as possibly confounding explanations of post-merger performance differences. Prior empirical evidence on the efficiency of savings banks by Altunbas et al. (2001) and Micco et al. (2007) do not find significant efficiency differences between these groups of banks in Germany. And, in fact, government-owned banks might fulfill important functions that private banks fail to provide. Berger et al. (2005b) provide, for example, evidence that monitoring techniques of small banks are better suited for lending to opaque SMEs. Related, Hakenes et al. (2014) show theoretically that small regional banks foster local economic growth and confirm this prediction empirically for German savings banks. Likewise, Berger et al. (2017) demonstrate that small banks possess a comparative advantage to provide liquidity insurance to SME, thereby helping to alleviate financing constraints especially of those firms that depend conventionally the most on bank credit. Importantly, Degryse et al. (2011) show that small bank mergers have in particular for those SME with just one single relationship the worst implications. Their banking contact is usually dropped and not replaced if their relationship lender turns out to be the target in a bank M&A, a result similar to the one documented before in the U.S., see Berger et al. (1998). Thus, it is a priori unclear whether forced savings bank mergers induced by county reforms only unlock previously unrealized profitability potential or whether they generate worse conditions for an important group of these banks' customers.

Our paper contributes to the scant evidence on the causal role of alternative mechanisms to impose managerial discipline and exert corporate control if no free market to transfer ownership rights exists. As such, we also shed light on the political economy of government involvement and adjustment dynamics of industrial structures in the financial sector, which also affects the market structure of non-financial industries, see Bertrand et al. (2007), Cetorelli and Strahan (2006), and Morck et al. (2011). Especially against the backdrop of the ESRB's claim of prevailing excess capacities, a firmer understanding regarding the drivers of – and impediments to – efficient attrition in this sector of the financial industry aids a better management and

policy process to face the ongoing challenges to change banks' business models significantly.

2 Institutional background and identification

2.1 German regional government-owned savings banks

In 2015, the German government-owned banking sector comprised 413 regional savings banks that managed an aggregate balance sheet of EUR 2,119 bil. assets, a 24% share of the German banking market. The average savings bank has a balance sheet of EUR 2.7 bil. and serves a regional market about the size of one county. Jointly they cater to every region in Germany, operate an extensive network of branches, and are owned by regional municipalities or counties.⁵

In addition to national regulation governing all credit institutions, they are subject to federal law regulating ownership, governance structure, and their business model.⁶ These laws impose institutional frictions on competition and consolidation in the government-owned banking sector. The geographical scope of business is confined to the territory of the owning locality, also known as regional demarcation (*Regionalprinzip*), *de facto* eliminating competition with another in credit and deposit markets. Likewise, a free market for corporate control does not exist. Mergers are only permitted between neighboring banks and only within the government-owned banking sector. Decisions about closure and mergers are not made by the management nor the supervisory board but by the local governing politicians of the owning county or municipality, to whom we refer henceforth as local politicians. They are subject to approval by the savings bank association and the federal regulator, which is one of the federal ministries. The savings bank association sometimes recommends mergers between distressed and healthy banks as a measure of last resort in order to avoid closure (Koetter et al., 2007; Behn et al., 2015).

Another important aspect of regulation which is relevant after county reforms is that counties and municipalities should not own more than one savings bank. As a consequence, federal laws or the reform bills themselves state that in case any of the newly formed counties should own more than one savings bank after a spatial reform, these banks have to merge.⁷ Often the

⁵The legal concept of government ownership (*Trägerschaft*) shares key features of private ownership but is not identical. The relevant differences are discussed in the text. In the following, we continue to call local politicians who represent the relevant region over the election cycle the owner of the savings bank.

⁶We distinguish between the local, federal, and national level. The federal level refers to the 16 German states.

⁷See Mecklenburg-Vorpommern: §28 Abs.1a SpkG des Landes Mecklenburg-Vorpommern, §25 LNOG vom 1.Juli 1993, and §41 LNOG vom 12. Juli 2010; Saxony-Anhalt: §30 Gesetz zur Kreisgebietsreform vom 20.Juli 1993, and §18 LKGebNRG vom 11. November 2005; Saxony: §22 SächsKrGebRefG vom 24.Juni 1993, and §25 SächsKrGebNG vom 29. Januar 2008; Thuringia: §11 ThürMaßnG; Brandenburg §35 BbgSpkG, and §26 KNGBbg vom 24. Dezember 1992.

reform bills contain a deadline of two or three years within which this consolidation process has to be completed (see Table OA1 in the Online Appendix). Importantly, it is federal but not local politicians who vote on county reforms. The reform-induced mergers are therefore forced on local governments and their government-owned savings banks.

Besides the decision about mergers and closures, local politicians exercise control over savings banks via the supervisory board. The composition of the supervisory board is regulated in detail. The chairman has to be the elected governor of the municipality or county. The remaining board seats are distributed among other local politicians, other bureaucrats, and representatives of employees. Recent studies show that the degree of influence by local politicians is sufficient to distort lending behavior, decisions to merge or lay-off employees, and bailout decisions around elections (Hackethal et al., 2012; Behn et al., 2015; Englmaier and Stowasser, 2017). The timing of these distortions around elections stresses that local politicians enjoy personal benefits by controlling a savings bank. Additionally, there could be social and welfare benefits of owning a bank for the county or municipality itself. By constitution, savings banks serve the public by providing banking services to all regions and promoting the regional economy. Often they engage in charity and foster cultural and sports events.

The institutional setting allows the extraction of pecuniary rents on behalf of the county.⁸ Since 2002, counties and municipalities, as owners, do not participate in the losses of the bank anymore by issuing guarantees or bailout, because the EU commission ruled it to be a distortion of competition. Yet, they are allowed to participate in the profits. The federal laws prescribe a maximum share of distributable profits. The management board proposes the allocation of earnings to the supervisory board which has to affirm it. If the supervisory board is split between representatives of more than one county after a merger, extracting rents for one group of owners becomes increasingly difficult. In conclusion, the institutional background sets incentives for local politicians to prevent mergers in their own private as well as genuine public interest.

2.2 German county reforms

Spatial reforms change how the national territory is divided among federal and local political entities. In Germany they occur only on the local-level within federal states. The local governmental layer is divided into counties and municipalities. In 2015, 11,168 municipalities formed

⁸Anecdotal evidence shows however that only few savings banks distribute profits to their owners, see Correctiv Recherchen für die Gesellschaft gemeinnützige GmbH (2015).

402 counties which once were 543 counties after reunification in 1990 (Statistisches Bundesamt, 2015). We focus on county-level reforms.

County reforms are initiated and decided on by the federal states' parliaments and not by local politicians on the county-level. They are usually linked to functional reforms of the state's administration and accompanied by municipal-level spatial reforms (BBSR, 2010). The main motives are to increase the efficiency of administration and to ease fiscal budgets by forming fewer and consequently larger counties (BBSR, 2010).

Since German reunification, eight major reforms took place in five East-German states, each of which reducing the number of counties on average by half. Appendix Table OA1 shows the number of counties, savings, and cooperative banks before and after each reform. In West-Germany, two metropolitan areas were created: Aachen in North Rhine-Westphalia and Hanover in Lower Saxony. Both county-level reforms implied that two cities were joined with their surrounding counties. These 10 county reforms serve to identify treated savings banks.

Local politicians usually oppose reform plans since they lose their autonomy. Therefore, reforms are heatedly discussed before their legislative passage as well as after. Reform bills are issued by a majority vote of federal politicians. In light of our identification strategy, it is noteworthy that the allocation mechanism of seats in state parliaments implies that a dominant role of federal politicians with the same local interests as local politicians is extremely unlikely. Only around half of the seats of the state parliaments are allocated to politicians who directly represent voting districts. These voting districts are not equal to counties. They are set in such a way as to represent a certain population (about 60,000). Therefore, less populated rural counties are combined to voting districts and bigger cities are divided into several voting districts. Since big cities usually keep their status even after county reforms, treated rural counties are underrepresented in state parliaments. The other half of the seats are allocated to politicians that are chosen from a ranked list generated by each political party. These members of state parliaments therefore do not have to represent any particular local interest per se. They are often "professional" politicians and parties assign better ranks to these experts – or long serving party members – to increase their odds to become a member of parliament.

With respect to saving banks, politicians can lobby upfront for an exemption ruling. This led to a suspension of the coercion to merge in the reforms in Saxony in 2008 and Mecklenburg-Vorpommern in 2011. We observe two counties in Saxony and two counties in Mecklenburg-

Vorpommern that own more than one bank after the reforms. The Saxonian banks merged eventually (in 2010 and 2012) while the Pommeranian do not.⁹

2.3 Identification

Baseline as well as alternative identification strategies are illustrated in Figure 1. In the baseline specification, we focus only on merging banks from either the cooperative or the savings bank sector, which are shown in the left-hand panel.

– Figure 1 around here –

We start by considering only merging banks i , which reside in (pre-reform) counties k'_1 and k'_2 . That is, we disregard both non-merging banks and those that merge, but do so in non-reforming counties. Our focus is thus on those counties that form a single geographical entity k – and hence owner of local savings banks – after county reforms. Observed savings banks (SB_i) mergers are therefore forced upon the management and owners of either pre-reform, independent banking entity i' as a result of the legal requirements of the savings bank laws of the respective state. In contrast, observed cooperative bank (SB_i) mergers occur voluntarily. This identification approach therefore compares post-merger performance of the four pre-reform banks $i' = 1, 2, 3, 4$ in the upper left panel of Figure 1, which merge into banks $i = 1, 2$ in the lower left panel. These two banks face otherwise identical, unobserved regional conditions, such as sluggish demand for banking products that fuel consolidation pressures. Consequently, we attribute any significant performance difference to the abandoning of having separate savings banks per county.¹⁰

The second identification strategy acknowledges the abundant literature on conflicting merger motives, say cherry picking versus the “silent” resolution of bank distress via pre-emptive mergers. Therefore, we sample merging banks in non-reforming counties as well: $i' = 5, 6, 7, 8$ in the upper right panel depicting the non-reformed counties $k = 2$ and $k = 3$. These mergers then give rise to a new savings bank $i = 3$ and a new cooperative bank $i = 4$, each of which catering to both counties simultaneously. The post-merger performance comparison between banks $i = 1, 2, 3, 4$ relies now on both the within-county variation between savings and cooperatives as

⁹We treat these two Saxonian mergers as treated by reform which can only harm our results. As a robustness check, we split the sample in the year 2000 and use only the early reforms.

¹⁰We demonstrate in Table 3 that sampled savings and cooperative banks are for the most part not statistically different regarding the level of observable financial traits and exhibit no statistically discernible trend in any of the controls we specify and discuss below in more detail.

in the baseline identification and the between-county, between-merged bank variation of regions $k = 2, 3$ and $k = 1$.

In our third identification strategy, we finally include non-merging savings and cooperative banks, too. In terms of Figure 1, we add banks such as $i = 5, 6$ to the post-reform control group so as to assess whether savings banks that are subject to a governance shock through county reforms also unleash profitability potential relative to incumbent competitors that maintain the size of their operations.

3 Methodology and Data

3.1 Methodology

To test if M&A that are induced by the rupture of political hurdles enhance profitability, we compare post-merger bank entities to a synthetic pre-merger entity. We construct the latter as follows. Almost all banks in our sample exit the market via M&A. Thus, the assets of exiting banks remain within the (savings or cooperative) banking sector and end up at with one surviving bank at the end of our sample period in 2015. We identify acquiring banks as well as any subsequent acquirers up to a maximum of four layers of acquisition history for each exiting bank until we identify this ultimate survivor. For each of these surviving banks, we construct a synthetic pre-merger bank. We aggregate the assets, liabilities, and income statement positions from the first until the last available report before the M&A of all exiting banks whose acquisition history leads to the ultimate survivor bank.

We then specify a difference-in-differences model to test if county-reform induced M&A unleash profitability potential among previously constrained banks:

$$\begin{aligned} Profitability_{i,t} = & \alpha_i + \delta_t + \gamma \mathbf{X}_{i,t-1} + \beta_1 \left(Merger_{i,t} \right) + \beta_2 \left(Reform_{i,t} \right) \\ & + \beta_3 \left(Merger_{i,t} \times Reform_{i,t} \right) + \beta_4 \left(Merger_{i,t} \times SB_i \right) + \beta_5 \left(Reform_{i,t} \times SB_i \right) \\ & + \beta_6 \left(Merger_{i,t} \times Reform_{i,t} \times SB_i \right) + \epsilon_{i,t} \end{aligned} \quad (1)$$

The main dependent variable $Profitability_{i,t}$ is measured as the return on equity of synthetic bank i in year t , defined as the ratio of operating profits before taxes over gross book-value equity.

$Merger_{i,t}$ is an indicator variable equal to one in all years after a M&A. Since events occur at

different points in time for each unit under observation, $Merger_{i,t}$ is defined in event time which is set to zero for all merging banks in the year of the merger. This is the first year in which the acquiring bank issued accounts incorporating the target and the target stopped reporting. We exclude this year from the estimation to avoid measuring profitability changes due to technical accounting issues. The indicator variable equals zero up to four years before the transaction and it equals one up to four years after the event.

On average, synthetic banks merge more than once, cooperative banks even more than twice. Consequently, the treatment dummy $Reform_{i,t}$ is defined per transaction and bank. It is equal to one in the pre- and post-period if the merger took place within three years after a county reform. For example, for banks headquartered in a county in Saxony-Anhalt, which was reformed in 1994, any deal in 1994, 1995, or 1996 would be treated. By using a three year window, we account for the deadlines fixed in the reform bill (Table OA1 shows that in case of Saxony-Anhalt 1994 this was 1st January 1997) and the fact that we use end-of-year bank data.

SB_i is a dummy variable indicating if the bank is a government-owned savings bank (as opposed to a cooperative bank). The coefficient of interest is β_6 of the triple interaction term. It measures the difference in the effect of merging with or without a reform on profitability for savings relative to cooperative banks.

3.2 Data

We use bank-level data from annual accounts and regulatory statements reported to Deutsche Bundesbank and supplement it with event data on mergers and events of distress provided by Deutsche Bundesbank for the period 1993 to 2015. The database on distress events is available from 1995 to 2013. We exclude the private banking sector because we cannot attribute financial data of nationwide operating private banks to local banking markets. However, we observe the whole universe of government-owned savings and cooperative banks in Germany. We have 714 reporting savings banks and 2,782 reporting cooperative banks and 80,868 observations in our data. We complement this with macroeconomic data at the county-level provided by the Federal Statistical Office of Germany and spatial data provided by the Federal Institute for Research on Building, Urban Affairs and Spatial Development (BBSR), which we use to construct a reform-indicator on the county-level. We match these regional information based on the location of banks' headquarters using a county-level identifier.

We estimate Equation (1) with a sample of transactions, i.e., each bank included in the

sample merges eventually. We accumulate all transactions of an acquirer during a year and treat them as one transaction with multiple targets. All in all, we observe 1,820 deals. These deals involve 286 savings and 1,740 cooperative banks as targets, and 182 savings and 889 cooperative banks as acquirers.¹¹ By considering these transactions, we capture 98.5% of all exits in the population, i.e., we record only 30 exits of regional banks over the sample period that cannot be attributed to a merger.¹² Of these we have to discard 193 transactions because of missing covariates. Our sample consists then of 1,627 transactions, 233 of which took place in the government-owned banking sector. We observe 48 reform-induced mergers of government-owned banks and 26 reform-induced mergers of cooperative banks. Table 1 depicts the dynamics over time.

– Table 1 around here –

One important concern is that savings and cooperative banks are significantly different and therefore constitute a poor comparison. Previous studies suggest that acquirers are different from targets (Hannan and Rhoades, 1987) and that in particular stressed savings banks are merged rather than closed (Koetter et al., 2007). Hence, banks that merge voluntarily – cooperatives – might be different from savings banks that are forced to merge due to a county reform. A couple of features in our setting alleviate concerns about spurious comparisons though.

– Figure 2 around here –

First, and most importantly, Figure 2 corroborates that the average profitability of treated and untreated banks within a banking group evolve similarly in the pre-merger time window, but differs starkly for savings banks only.

– Table 2 around here –

Table 2 provides a comparison of average means of the levels and first-differences of the profitability measure in the pre-merger period over treatment and ownership status. The upshot of the table is that the difference-in-differences of means is neither significant in levels nor in the slopes before the event takes place (last row in Columns (3) and (6)). Savings and cooperatives that are treated as well as untreated and treated cooperative banks do not differ

¹¹About 24% of the acquiring savings banks and about 46% of the acquiring cooperative banks merge more than once. Yet some acquirers are themselves targets later on.

¹²Bank exit is defined as stopping to report total assets to Deutsche Bundesbank.

significantly before the merger. Profitability differences between cooperative and savings banks that are untreated and between treated and untreated savings banks are significant though. Note, however, that the latter differences only appear in levels so that fixed effects and the covariates control for the difference.

Second, the use of synthetic pre-merger bank-entities levels out some of the performance differences between target and acquiring banks. Third, we exclude and control below for mergers where a party was in distress as a robustness test. Fourth, we are interested in the effect of the reform as an alleviation of frictions, not in the effect of merging per se. Therefore, any potential selection bias between non-merging and merging banks is less likely to bias our test.

We control for macroeconomic and bank-specific conditions, which are defined in Appendix Table OA12. We use bank-level fixed effects to account for unobserved time-invariant heterogeneity across banks. To address time-varying variation between banks, we add CAM(E)L financial ratios and proxies for banks' business models, and size (Wheelock and Wilson, 2000). Summary statistics in Table 3 show that despite some significant differences in the differences of levels (Column (9) upper part), the difference-in-differences of the slopes of all covariates except loan loss provisions are insignificant (Column (9) lower part).

– Table 3 around here –

We measure banks' financial profile with (i) balance-sheet equity to total assets ratio as a measure for capital adequacy (*Equity*), (ii) loan loss provisions to total loans for asset quality (*LLP*), (iii) cost-income-ratio for management quality (*CIR*), and (iv) liquid to total assets for liquidity profile (*Liquidity*). In the baseline estimation we exclude proxies for earnings because these are strongly correlated with our dependent variable. To capture the business model we add (v) consumer loans to total assets ratio (*Loans*), and (vi) non-interest-income to total income (*NII*). Lastly, we add (vii) size of total assets as a categorical variable (*Size*). In order to avoid endogeneity we lag covariates by one year. To account for macroeconomic differences which affect business opportunities and demand for banking services, we add year \times state fixed effects and control for GDP at the county-level. Our choice of covariates at the county-level is restricted due to a limited availability of other macroeconomic measures in the early 90ies in East-Germany.

4 Results

Main results Table 4 shows our baseline regression results from estimating Equation (1). We start in Column (1) with a sample of merging banks that resided only in reformed counties. That is in terms of the illustration in Figure 1, we consider banks $i' = 1, 2, 3, 4$ in the upper left panel. The results in Column (1) show that our coefficient of interest, the triple interaction term β_6 between government ownership, the occurrence of a merger, and a spatial reform affecting the county of banks' residences, is positive and statistically significant.

– Table 4 around here –

In fact, the economic magnitude of this “unleashing potential” effect is large. Government-owned savings banks that merge after a county reform exhibit a positive differential return of equity (RoE) effect on the order of 5.7 percentage points relative to the comparison group. The peers to which we compare post-merger performance in Column (1) are non-yet-merged savings and cooperative banks before the reform. The total relative effect of the reform on savings banks' profitability is 0.33 percentage points ($-0.024 + 0.057$). Against the backdrop of an average RoE of 7.9% in our sample, this estimate implies that savings banks increase their RoE after a reform merger relative to other merging banks that are still in the pre-merging period by roughly 41%. In contrast, cooperative banks – which are not subject to any potential political frictions that held them back from realizing optimal profits prior to the county reform – exhibit a RoE effect that is 2.4 percentage points lower than before the reform.

Note that these results are unlikely to reflect fundamentally different business models between savings and cooperative banks, which are absorbed by bank-fixed effects. In addition, recall that we specify time-varying control variables at both the bank- as well as the county-level, which limits the danger that other (time-variant) unobserved effects bias our estimate. Another concern is that county reforms might not occur randomly but correlate, for example, with well-documented electoral and/or budgetary cycles at the national and sub-national level of the states.¹³ Dire state-specific macro and credit demand conditions might actually ignite both county reforms and bank mergers. Because of this valid potential reservation, we specified state-by-year fixed effects. Thereby, the coefficients in Table 4 result from a within state-year comparison of banks which controls for between-state differences in terms of economic

¹³See, for example, Seitz (2000) and Galli and Rossi (2002) for evidence at the subnational level of German states and Katsimi and Sarantides (2012) or Efthymoulou (2012) for national evidence in Europe.

surroundings, political influences, and other unobservable demand effects. Given this encompassing saturation of the model with fixed effects to gauge unobservable drivers of post-merger bank profitability, it is remarkable that in all regression analyses the within-county variation in covariates identifies around one third of the total variation in banks' RoE.

Whereas the tight specification in Column (1) provides a very clean identification of the RoE differential effect, it entails the disadvantage of limiting any inference beyond locally merging banks in counties that actually experienced a spatial reform at some stage. Since the majority of reforms – and hence reform-induced mergers – pertain to East-German states (see Table OA1), we expand the control group in Column (2) by merging savings and cooperative banks from non-reforming counties. This specification therefore also gauges cases of savings (and cooperative) bank mergers that occurred without an exogenous change forced upon the local politicians that own savings banks, and thus the governance exerted by them. This specification is based on a sample of bank-year observations that is almost three times as large, yet yields virtually identical results concerning statistical significance, direction of effects, as well as economic magnitudes.

An alternative scenario why the performance of government banks is unleashed might, however, also be that the reform of counties in and of itself leads to profitability improvements. It is not unreasonable to suspect that county reforms in pursuit of unrealized administrative efficiency gains extend in particular banks supervised and owned by that very government. As such, any profitability gains from ceased political frictions would apply to non-merging savings banks as well. In that case, the consideration of merging banks only might give rise to spurious RoE effects of reform-induced consolidation. To test if RoE effects are at work through the elimination of excess capacities due to enforced mergers, we therefore also include banks that did not merge at all in Column (3). In terms of Figure 1, this specification corresponds to banks $i = 5, 6$. The main effects remain qualitatively intact for this sample as well, although the economic magnitude of both the total effect of reforms as well as the triple differential effect reflected by β_6 is somewhat smaller. Overall, these results corroborate the robustness of the main findings so far that savings banks are significantly more profitable after a merger that was induced by a county reform. Henceforth, we focus on the specification in Column (2), which compares only merging savings and cooperative banks, however from both reformed and non-reformed counties.

The headline result implies, that a reduction of political frictions induced by county mergers increases the profitability of savings banks by fueling consolidation in this part of the bank-

ing sector. In light of alleged excess capacities prevailing in European banking (ESRB, 2014), increased direct and indirect government stakes in European banks after the Great Financial crisis, and notoriously low profitability reducing political governance frictions appears an effective and potentially important way forward for the financial industry.

An important open issue to completely assess the potential policy implications of our results is, however, whether reform-induced mergers actually yield sustained profitability improvements compared to other merging banks that did not experience a hike in governance pressure. Therefore, we specified in Equation (1) increasingly long post-merger reform periods to assess if and for how long reform-induced M&A enhance RoE. Figure 3 plots these effects for post-reform periods of up to 8 years.

– Figure 3 around here –

The left panel of the figure shows estimated double and triple interaction effects together with corresponding 95% confidence bandwidths from regressions of Equation (1) for our main sample (Column (2) in Table 4) across increasing lag lengths depicted on the x-axis. The differential effect in banks' return on equity between government- and cooperative banks stays significant for up to eight years after a reform-induced merger. The right panel plots the overall effect of county reforms on the profitability of savings bank, which remains significantly positive for the entire period, too. Thus, the profitability gains experienced by government-owned savings banks that are unleashed by removing the political shelter prior to county reforms do not vanish quickly. Instead, these profitability gains appear to be statistically significant and economically meaningful for a considerable period of time.

Robustness. In this section we provide several robustness checks for our baseline results and provide all corresponding tables in an Online Appendix.

First, Table OA2 show regression results for different bank profitability measures and different samples. For comparison, Column (1) provides the regression results for the sample of merging banks in all counties from Table 4. Column (2) and (3) show that our results do not change, when we use return on gross equity or total assets instead of return on net equity. In both cases, the triple interaction term remains positive and significant, showing that savings banks become more profitable compared to cooperative banks after county reforms. Column (4) and (5) check whether our results are driven by a particular time period. Since most of

the county reforms took place in the 1990s, Column (2) provides results for this period only. Qualitatively, the results are almost identical regarding significance and magnitude as in the baseline case replicated in Column (1). However, when we confine the analysis to the years between 2000 and 2009, the results are insignificant. This feature mirrors that much fewer county reforms took place after the 1990s, also affecting a smaller number of banks. Next, we exclude distressed banks from the sample in Column (6) of Table OA2 as supervisory orders to restructure might be a confounding channel to unlock profitability potential after successful recovery of the merged entity (see Kick et al., 2016). Whereas the triple interaction term declines to an increase of RoE on the order of 4.6 percentage points, this result still indicates an economically large role played by regional government ownership acting as a roadblock to unlocking profitability potential. In the second but last column we acknowledge that savings banks might be more or less connected to local politicians through credit connections. We therefore gauge banks with particularly intensive political ties as those with a municipality lending share of total loans above the average of their banking groups. Excluding these banks with potentially particularly close political ties in Column (7) leaves the results untouched as well. Finally, we sample in the vein of Huang (2008) only banks from reforming counties and banks from adjacent non-reforming counties. This contiguous county specification ensures that those unobservable factors possibly not captured by the fixed effects are muted. Column (8) shows that savings banks still exhibit higher profitability after reform-induced mergers.

Second, Table OA3 checks some technical issues with our regression. The baseline results are reproduced again as a reference in Column (1). Column (2) shows results when we collapse the data per M&A transaction for the pre- and post-period to deal with potential biases from autocorrelation. Specifically, we follow Bertrand et al. (2004) and regress the dependent variable (gross return on equity) on the covariates, fixed effects, and the Reform indicator which defines the treatment status. This indicator variable equals one or zero in the pre- and post period of the merger, respectively. We retrieve the residuals of this regression and run cross-sectional regressions on them for treated mergers, separating them only by the pre-and post-variable Merger to eliminate the time dimension. The results in Column (2) show that the interaction effect of the merger dummy and the dummy that separates savings from cooperative banks is significant. Thus, this procedure leaves our effect intact. In Column (3) we include only transactions where the merging bank is observed in at least one pre-merger year. In the same vein, Column (4) provides robustness for a sample in which we include only transactions for

merging banks that stay in the sample for all four post-merger years and at least one pre-merger year.

Third, in Table OA4 we provide results from placebo reform treatments to verify whether the differential effect in returns was induced by reform or chance. We run two simulations with 1,000 replications and extract the probabilities to be treated by reform for each banking group separately. We separate by banking group because the probability to be treated for savings banks is significantly higher than for cooperative banks. The reason is that most of the reforms took place in East-Germany, but there exist dis-proportionally more cooperative banks in West-Germany and especially in the south of Germany. If we were not to account for these differences, we would over-sample cooperative banks. We assign reform treatment randomly over all years to other merger events, re-estimate our baseline specification (corresponding to Column (2) in Table 4) and test in each repetition the hypothesis that the coefficient on the triple interaction between reform, post-merger and public bank is equal to 0. We calculate the rejection rates of this test at 1%, 5%, and 10%, which are shown in Table OA4. We assign treatment randomly over all reporting banks, including those that were actually treated. Overall, Table OA4 shows for these random placebo treatments that our main effect is only significant within the range of statistical noise. This outcome thus strongly supports our results from Table OA4. The RoE increase due to county-reform induced mergers is very unlikely just due to statistical noise driven by other factors than the actual county reforms followed by (forced) bank mergers.

4.1 Further results

At first sight, the improvement of RoE in the aftermath of forced mergers might bode well to enhance the resilience of the European banking system, which exhibits since the Great Financial crisis sclerotic profitability according to a number of policy makers. However, it remains unclear so far, what are the drivers of these increases in profitability. In this section we seek to shed light on the possible channels that may drive the positive and significant effect on banks' return on equity from Table 4.

We begin to decompose the main components of Return on Equity from an accounting perspective to identify the source of profitability hikes: equity, profits, and cost. Next, we test for economic drivers documented in previous literature that might drive post-merger performance: risk, efficiency, and market power.

Equity decomposition A simple way to improve the profitability in terms of RoE is to increase leverage, clearly an undesirable strategy from a financial stability perspective if this risk-taking turns excessive. Table 5 therefore provides a decomposition of a bank’s gross equity positions, which is the numerator of our main performance metric. We reproduce the main results for return on equity in the first column and show subsequently results for gross equity and its components: net equity, accruals, and other equity. We specify the log level of these level variables to accommodate the heterogenous distribution in absolute sizes and so as to ease the interpretation of coefficients as semi-elasticities.

– Table 5 around here –

County reform-induced mergers exert no significant differential effect on banks’ gross equity (Column (2)), but decrease savings banks’ net equity position significantly. Column (3) show that compared to cooperative banks, savings banks’ net equity decreases by around 8.6% by the reform-induced merger. We provide more detailed results in Table OA5 in the Online Appendix. Here we find that the decrease in net equity is potentially driven by nominal equity (Column (2)) and retained earnings from the current accounting period (Column (5)). Both coefficients are negative, too, which might indicate that the new owners of the merged entity force it to disperse some of its accumulated earnings. Note, however, that in the more detailed decomposition the individual effects are not statistically significant.

The two remaining components in 5 that are part of gross equity are accruals and other equity. Column (4) shows that there is no significant triple interaction effect indicating that accruals are not driving our results. However, Table OA5 in the online appendix highlights that this absence of an effect is likely the result from counteracting effects of tax accruals that increase which is mitigated by a decrease in accruals for risk which mainly comes from provisions for loan losses and a reduction in accruals for pensions. Again, the low power that poses challenges to estimate a statistically significant effect induces us to refrain from strong inference. However, a possible narrative in line with these indications is that merged banks increase their operational risks as far as retaining earnings to cover the potential realizations of risks in the distant future – like pension obligations and more conventional credit risk – is concerned. At the same time, they might receive advantageous tax treatments that are reflected in increasing equity accruals for taxes.¹⁴

¹⁴Note that an economically important share of corporate taxes are levied at the level of counties (see Statistische Ämter des Bundes und der Länder (2014), *Gemeindesteuer*), which correlate with the political cycle (Foremny and Riedel, 2014).

The residual category is other equity. Here, the triple interaction coefficient is significantly negative and at first sight very large. But the economic magnitude of 350%, which appears as a huge effect, must be regarded in the light of a very high difference in this category between savings and cooperative banks in the pre-treatment period. As Table OA9 in the online appendix shows, this pre-treatment difference is about 576%. This result therefore rather indicates that mergers induced by county reforms alleviate some of this pre-treatment differences. The more detailed break-down provided in Table OA5 indicates that the overall effect appears to be primarily driven by an increase in subordinated debt.

In sum, an important source of increasing return on equity appears to accrue amongst merging savings banks from choosing lower capitalization ratios. Clearly, this might result from previously too high levels of capital held that were inefficient. Whereas we cannot, of course, evaluate with our approach the adequacy of capital levels, we conclude that *cet. par.* part of banks improved post-merger performance results from accepting also more risky balance sheet structures.

Profit decomposition If county reforms are the (positive) governance shock that we conjecture it to be, we should see in particular profits to increase and costs to be cut as a consequence of rectifying previously amassed operational slack, for example due to a Hicksian quiet life (see Koetter et al., 2012, for evidence how U.S. regulation sheltered banks from enforcing efficient operations). Therefore, we turn next to the numerator of banks' return on equity and investigate banks' revenues, profits, and cost components in Table 6. All variables are specified again in log-levels.

– Table 6 around here –

Column (1) shows that besides reducing capitalization, merged savings banks in reformed counties also substantially increased their profits before taxes. Mergers that are induced by county reforms increased savings banks' profits by about 330% compared to cooperative banks. This increase in profits is not due to an increase in revenues (Column (2)), but due to lower total costs that savings banks incur relative to their cooperative counterparts after county reform-induced mergers. Our findings are corroborated by Table OA6 which again shows that bank revenues of treated banks are barely affected by the county-reforms. However, Table OA7 show that lower costs of savings banks are mainly driven by cost reductions of interest expenses and other operating costs.

Bank risk. In this paragraph, we elaborate more on whether or not the reform merger-induced higher profitability of savings banks affects overall bank risk.

– Table 7 around here –

We document in Table 7 that the higher profitability ratios come with significant higher volatility (Column (2)) of return on assets. But, in combinations with unchanged tier 1 capital ratios (Column (3)), the reform-induced mergers have no significant differential effects on banks' z-scores. What we do find however, is a significant reduction in loan loss provisions and an increase in non-performing (both in relation to total loans) for savings banks in comparison to cooperative banks. In economic terms, our results suggest that the overall effect of reform-induced mergers on savings banks is a reduction of loan provision of about 0.6 percentage points and an increase of non-performing loans of 1.9 percentage points. In light of mean values of 0.01 for provisions and 0.06 for non-performing loans, these effects display a change in economic magnitude of about two and one third for both measures, respectively.

Bank efficiency. This paragraph explores the effects on banks' efficiency and we report our results in Table 8. In detail, we analyze effects on the number of branches and the number of employees (both in relation to total assets), the ratio of employees per branch, wages per employee, and the cost-income ratio.

– Table 8 around here –

Column (1) shows that there is no significant reduction of the number of branches relative to bank size for government- and cooperative banks. Furthermore, savings banks have more staff relative to bank size than cooperative banks after the reform-induced mergers (Column (2)). However, when we contrast employees with branches we find that savings banks manage to reduce the number of employees per branch by roughly 80% compared to the group of cooperative banks (Column (3)). This reduction is cost neutral since the overall on effect on labor cost (wages per employee) for savings banks is zero (Column (4)). Last, Table Column (5) of 8 shows that the differential effect on the cost-income ratio between government- and cooperative banks is negative but insignificant which indicates that the cost reductions do not materialize in a significant higher efficiency of savings banks post reform-induced merger.

Bank market power. In terms of market power, we further explore banks' net interest margins and its components, the banks' interest bearing assets consisting of loans to customers

and banks and securities, and the market share of banks in terms of loans to customers of a bank within its business area. We provide the results in Table 9.

– Table 9 around here –

Our results suggest, that the net interest margin serves as an explanation for the higher profitability ratio for savings banks. We find that reform-induced mergers of government owned banks lead to an increase of 0.2 percentage points which is significantly higher compared to the change of cooperative banks (Column (1)). In terms of a average of 0.03, this increase amounts to 6.7%. We further find, that the higher net interest margin stems from an increase of interest income (Column (2)), while interest expenses remain statistically unchanged (Column (3)). Interestingly, our results further indicate that savings banks at the same significantly decrease their interest bearing liability ratios (Column (4)), which suggests, that those banks manage to increase interest income ratios with fewer interest bearing assets. In more detail, Table OA8 in the Online Appendix shows that the reduction in interest bearing liabilities stems from lower customer loans and investments in bonds and securities of savings banks after reform-induced mergers. Last, in terms of market shares, Column (5) of Table 9 shows that reform-induced merges do not enable savings banks to gain market shares compared to cooperative banks.

5 Conclusion

This paper sheds light on the question if and to what extent the existence of political barriers in the form of government ownership is (i) a hindrance to consolidation (ii) and thus an obstacle to sustainable profitability in the banking industry. We conjecture that due to the absence of a (sufficiently) complete market for corporate control, too few bank exits might occur. The absence of efficient attrition, in turn, might lead to excess capacities that are partly responsible for observed profitability sclerosis after the Great Financial Crisis especially in European banking markets.

To identify any causal effect of government ownership on subdued exits, which in turn might or might not hold back profitability, is a daunting task that faces a battery of serious econometric challenges. First of all, if government ownership impedes “natural” governance mechanisms, we are seeking a non-event, namely those bank exits that should have but did not happen. Second, and somewhat more mundane and well-known, it is unclear whether banks do merge because of poor performance or whether mergers induce differential performance. And third, a number

of additional unobservable factors might drive profitability that have little to nothing to do with post-merger performance, ranging from aggregate demand, to credit market frictions, on to political and regulatory differences across regimes in, say, different countries.

Our setting is unique as it exploits a number of features that take care of these challenges. We consider local savings and cooperative bank mergers in Germany since 1993 until 2015. Our identification rests on three decisive features in German banking. First, local savings banks are owned by their regional political entity, usually one of the 402 counties that existed in 2015. Second, whenever these political entities are combined, residing savings banks are forced to merge as well because each county must not own more than one savings banks. In total, 10 spatial reforms occurred since re-unification of Germany, thereby leading to numerous “forced” savings banks mergers. We compare these to mergers amongst cooperative banks, which are privately owned and thus not subject to government-ownership shelter regarding corporate governance, in both reformed and non-reformed counties as well as savings bank mergers that happened without county reforms inducing them. Third, these county reforms are decided upon at the federal level in the parliaments of each of the 16 states. As such, they represent truly exogenous governance shocks to local savings banks that are required by law to merge. If the pre-merger entities were therefore inefficient and unprofitable because of shelter from governance forces by “their” local political owners, a merger of counties should unleash profitability potential after forced merger took place.

Based on comprehensive data obtained from Deutsche Bundesbank, we confirm indeed that savings bank profitability increased substantially relative to that of cooperative banks in both reformed and non-reformed counties. For up to eight years after mergers that were induced by county reforms, return on equity increased by approximately 5 to 6 percentage points, which is substantial in light of mean profitability on the order of 8 percentage points. These improvements, however, appear to be associated with increasing risk indicators. Merging savings banks reduced their capitalization as well as loan loss provisioning. Likewise, we find evidence of increasing non-performing loan shares after such county-reform induced merger. Whereas market power concerns are not confirmed, if anything interest expenses are reduced which might in fact indicate improvements in managerial efficiency. However, other indicators of operational efficiency – such as employment or the number of branches – do not exhibit recognizable declines.

Overall, our results thus indicate that performance improvements unleashed by reducing government ownership barriers to market exit in banking is realized at the expense of increased

risk at the average bank. Whether these effects are simply a reversal of inefficiently low risk-taking prior to enforced banking market consolidation or if it indicates excessive risk taking cannot be concluded on grounds of our partial equilibrium, empirical exercise. However, the robust as well as statistically and economically significant profit hike due to (political) reform-induced mergers might inform policymakers how to deal with continuously low profitability in European banking also outside Germany that is paired with increasingly direct and indirect interdependence between banks and national government since the Great Financial and the sovereign debt crises.

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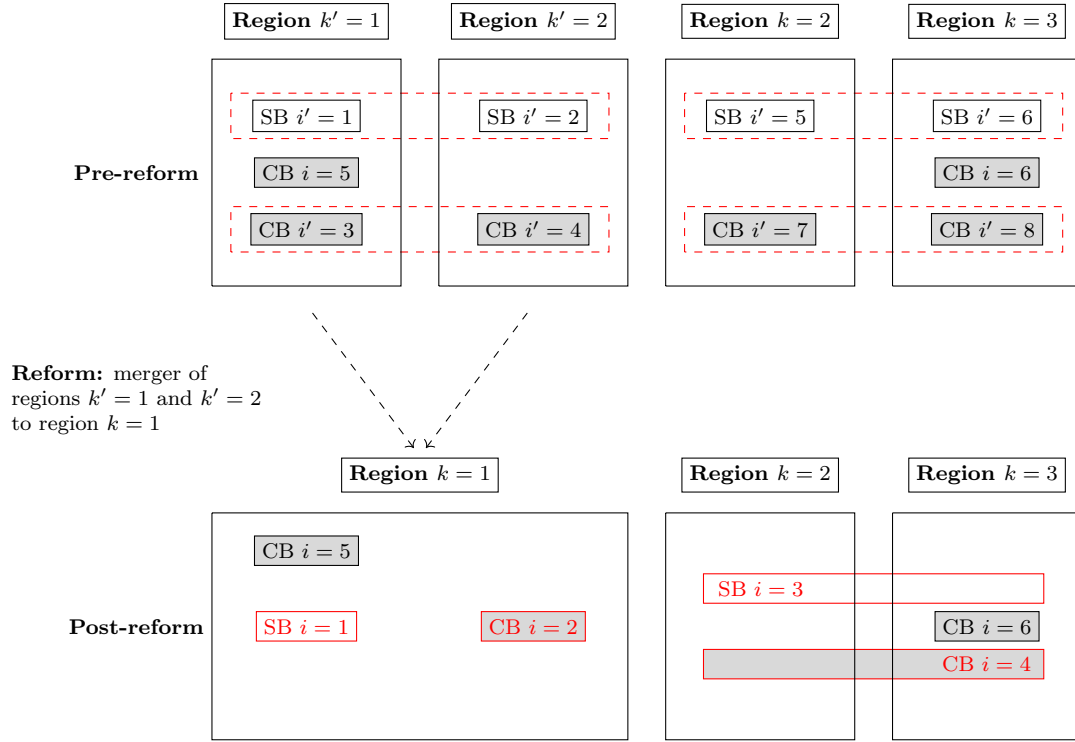
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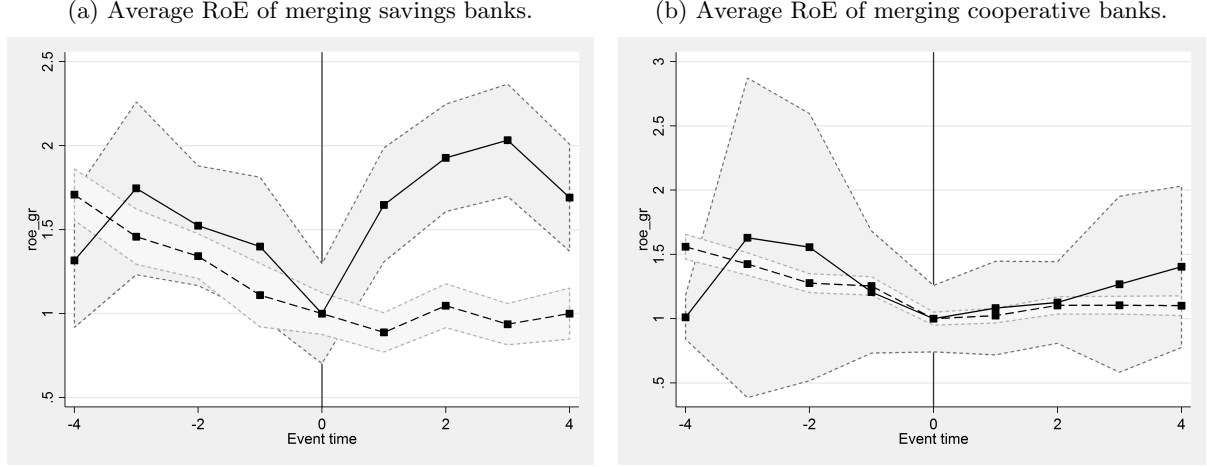
Figures

Figure 1: Identification



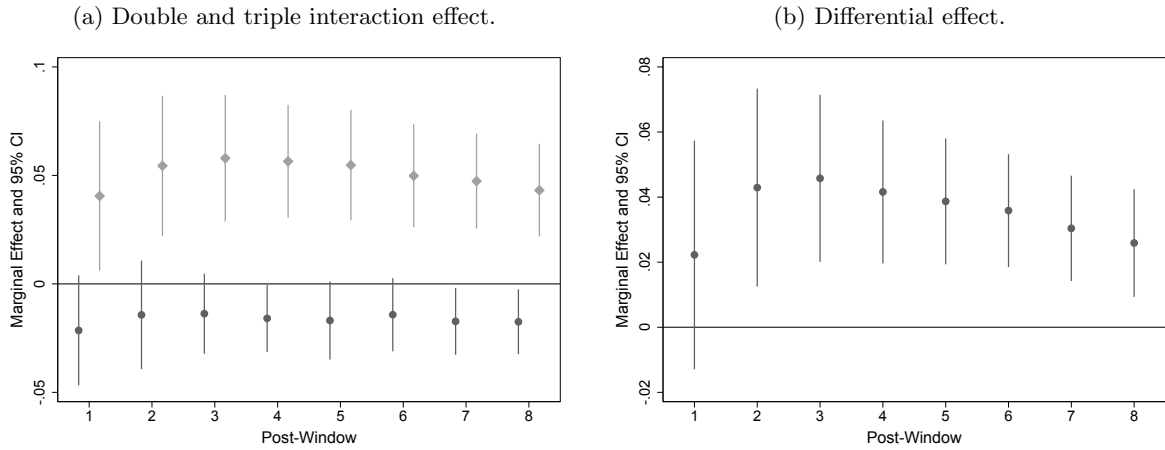
This figure shows savings banks (white squares) and cooperative banks (gray squares). The banks are active in regions $k' = 1, \dots, 4$ before a regional reform. Through a regional reform, the two regions $k' = 1, 2$ merge to region $k = 1$ while the regions $k = 2, 3$ are not reformed. The savings banks $i' = 1, 2$ and cooperative banks $i' = 3, 4$ merge into savings bank $i = 3$ and cooperative bank $i = 4$ in the reforming regions. However, the savings banks $i' = 5, 6$ and cooperative banks $i' = 7, 8$ merge into savings bank $i = 3$ and cooperative bank $i = 4$ in the reforming regions, too. The dashed areas that span around the savings and cooperative banks before the regional reform indicated that for the analysis the banks are synthetically merger already before their mergers. The two cooperative banks $i = 5, 6$ active in reforming region $k'1 = 1$ and non-reforming region $k = 2$ do not merge.

Figure 2: Bank profitability around the event.



Average Return on Gross Equity (lines) ± 2 standard errors (shaded area) in event time by ownership rescaled to 1 at event time 0. The solid line represents treated banks and the dashed line the non-treated banks.

Figure 3: Long term effects.



Coefficients and 95% confidence intervals of the effect of reform on merging savings banks for different time windows (0-10). The left graph displays the double and triple interaction effect, i.e., β_3 (dark gray) and β_6 (light gray) in Equation (1). The right graph shows the differential effect of reform on the effect of merging for savings banks, i.e., $\beta_3 + \beta_6$ in Equation (1).

Tables

Table 1: Observations, number of banks, and number of deals each year for the sample of merging banks according to treatment and ownership status.

	Observations				Banks	Deals			
	Savings		Cooperatives		Total	Savings		Cooperatives	
	Non-T (1)	Treat (2)	Non-T (3)	Treat (4)		Non-T (6)	Treat (7)	Non-T (8)	Treat (9)
1993						13	2	74	2
1994	26	18	239	7	290	7	11	62	7
1995	37	18	322	10	387	1	19	43	8
1996	43	31	362	12	448	6	6	62	4
1997	56	37	389	14	496	6	1	68	0
1998	57	35	361	4	457	4	0	110	0
1999	67	25	343	0	435	11	0	126	0
2000	73	6	321	0	400	15	0	175	0
2001	83	2	408	1	494	19	0	125	0
2002	85	1	420	2	508	17	0	102	0
2003	75	0	412	0	487	27	1	83	2
2004	84	5	402	2	493	13	0	53	0
2005	74	6	346	2	428	14	0	42	0
2006	68	7	285	3	363	7	0	31	0
2007	58	8	231	3	300	4	0	21	0
2008	43	3	175	2	223	2	4	33	0
2009	35	5	152	1	193	5	2	36	1
2010	26	7	165	2	200	1	1	17	1
2011	19	8	162	3	192	3	0	17	0
2012	16	8	143	3	170	2	0	18	0
2013	14	3	122	2	141	4	1	19	1
2014	12	2	90	1	105	1	0	29	0
2015	9	1	80	0	90	3	0	22	0
Total	1,060	236	5,930	74	7,300	185	48	1,368	26

Notes: In Columns (1) to (4) observations of synthetic or original banks are counted. In Column (5) observations are summed up per year giving the number of banks (original and synthetic) each year. In Columns (6) to (9) mergers are counted in the year when they occurred.

Table 2: Summary statistics of Return on Equity by ownership and treatment in the pre-merger period of merging banks.

	Untreated by Reform (1)	Treated by Reform (2)	Diff. in Treatment (3)	Untreated by Reform (4)	Treated by Reform (5)	Diff. in Treatment (6)
	<i>Levels</i>			<i>First-Differences</i>		
Savings	0.075 (0.057)	0.058 (0.045)	0.016 (0.019)	-0.010 (0.045)	-0.017 (0.055)	0.007 (0.368)
Cooperative	0.080 (0.063)	0.068 (0.050)	0.011 (0.325)	-0.004 (0.052)	0.007 (0.055)	-0.012 (0.364)
Diff. in Ownership	0.005 (0.087)	0.010 (0.448)	-0.005 (0.707)	0.006 (0.016)	0.024 (0.104)	-0.019 (0.195)

Notes: Columns (1), (2), (4), and (5) show the mean and standard deviation in parentheses. Columns (3), and (6) show the difference in means and the p-value of a difference-in-means test in parentheses.

Table 3: Summary statistics of explanatory variables by ownership and treatment in the period before the merger.

	Savings			Cooperative			Diff.	Diff.	Diff.
	Non-T	Treat	Diff.	Non-T	Treat	Diff.	Non-T	T	Diff.
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
<i>Levels</i>									
Equity	0.046 (0.009)	0.039 (0.009)	0.007 (0.000)	0.053 (0.011)	0.048 (0.009)	0.005 (0.016)	-0.008 (0.000)	-0.009 (0.000)	-0.002 (0.445)
LLP	0.009 (0.007)	0.024 (0.014)	-0.016 (0.000)	0.007 (0.009)	0.010 (0.007)	-0.003 (0.070)	0.001 (0.000)	0.014 (0.000)	0.013 (0.000)
CIR	0.669 (0.068)	0.630 (0.068)	0.039 (0.000)	0.739 (0.139)	0.737 (0.080)	0.002 (0.900)	-0.070 (0.000)	-0.107 (0.000)	-0.037 (0.067)
Liquidity	0.043 (0.024)	0.067 (0.022)	-0.023 (0.000)	0.064 (0.028)	0.097 (0.028)	-0.033 (0.000)	-0.021 (0.000)	-0.031 (0.000)	-0.010 (0.151)
Loans	0.607 (0.107)	0.365 (0.093)	0.242 (0.000)	0.596 (0.093)	0.415 (0.120)	0.180 (0.000)	0.012 (0.030)	-0.050 (0.105)	-0.062 (0.038)
NII	0.172 (0.034)	0.177 (0.052)	-0.005 (0.481)	0.184 (0.058)	0.232 (0.074)	-0.048 (0.009)	-0.012 (0.000)	-0.055 (0.005)	-0.043 (0.015)
Size	4.052 (1.104)	3.509 (0.973)	0.542 (0.000)	3.833 (1.091)	3.850 (1.089)	-0.017 (0.946)	0.218 (0.000)	-0.341 (0.230)	-0.559 (0.044)
Log(GDP)	8.594 (0.902)	8.161 (0.667)	0.433 (0.000)	8.405 (0.778)	8.467 (0.818)	-0.062 (0.740)	0.190 (0.000)	-0.306 (0.146)	-0.495 (0.016)
<i>First-Differences</i>									
Equity	0.001 (0.002)	0.000 (0.002)	0.000 (0.137)	0.001 (0.002)	0.000 (0.003)	0.001 (0.332)	-0.000 (0.000)	-0.000 (0.636)	0.000 (0.841)
LLP	0.000 (0.007)	0.004 (0.015)	-0.003 (0.102)	-0.000 (0.009)	-0.002 (0.009)	0.002 (0.300)	0.000 (0.260)	0.006 (0.040)	0.006 (0.049)
CIR	0.007 (0.057)	-0.031 (0.094)	0.039 (0.005)	0.004 (0.141)	-0.027 (0.058)	0.030 (0.033)	0.004 (0.356)	-0.005 (0.794)	-0.008 (0.648)
Liquidity	0.002 (0.019)	-0.003 (0.020)	0.005 (0.119)	0.000 (0.024)	-0.007 (0.033)	0.007 (0.338)	0.001 (0.152)	0.004 (0.602)	0.003 (0.723)
Loans	0.001 (0.019)	0.009 (0.023)	-0.008 (0.022)	0.002 (0.023)	0.010 (0.024)	-0.008 (0.156)	-0.001 (0.193)	-0.002 (0.811)	-0.000 (0.969)
NII	0.005 (0.017)	0.007 (0.016)	-0.002 (0.382)	0.006 (0.045)	-0.001 (0.025)	0.006 (0.271)	-0.000 (0.759)	0.008 (0.188)	0.008 (0.156)
Size	-0.002 (0.213)	-0.057 (0.305)	0.054 (0.210)	-0.002 (0.188)	0.050 (0.394)	-0.052 (0.565)	-0.000 (0.966)	-0.107 (0.284)	-0.106 (0.269)
Log(GDP)	0.020 (0.033)	0.073 (0.065)	-0.054 (0.000)	0.027 (0.035)	0.062 (0.072)	-0.035 (0.045)	-0.007 (0.000)	0.012 (0.530)	0.019 (0.304)

Notes: Columns (1), (2), (4), and (5) show means and standard-deviation in parentheses by treatment and ownership. Columns (3), and (6) show the difference in means by treatment with p-value of t-test in parentheses within each banking sector. Columns (7), and (8) show the difference in means by ownership with p-value of t-test in parentheses within treatment status. Column (9) shows the difference-in-differences with p-value of t-test in parentheses. Equity, Loan Loss Provisions (LLP), Liquidity, and Loans are defined as ratios to total assets. Non Interest Income (NII) is defined as ratio relative to interest-bearing assets. Size is a categorical variable indicating the quintile of the banking groups size distribution in terms of total assets. Cost-Income-Ratio (CIR) is defined as administrative costs to total income. L(GDP) is the logarithm of GDP at the county level of the bank's headquarters.

Table 4: Effect of reform on profitability.

	Merging Reformed (1)	Merging (2)	Incl. Non-merging (3)
Merger	0.001 (0.002)	-0.003* (0.001)	0.000 (0.001)
Reform	0.011* (0.007)	0.007 (0.007)	-0.003 (0.007)
Merger*Reform	-0.024*** (0.008)	-0.016** (0.008)	-0.016** (0.008)
Merger*SB	-0.014** (0.006)	-0.014*** (0.004)	-0.011*** (0.003)
Reform*SB	-0.006 (0.013)	-0.008 (0.012)	0.005 (0.008)
Merger*Reform*SB	0.057*** (0.015)	0.056*** (0.013)	0.038*** (0.011)
Observations	2,441	7,300	20,893
Banks	291	788	1,438
Savings Banks	85	163	414
Cooperative Banks	206	625	1,024
Treated Deals	74	74	74
Non-treated Deals	466	1,553	1,553
Mean	0.079	0.078	0.083
Median	0.075	0.078	0.078
Standard Deviation	0.056	0.062	0.067
Bank & County Controls	yes	yes	yes
Bank & Year*State FE	yes	yes	yes
R-squared (within)	0.415	0.324	0.322

Notes: Clustered standard errors at the bank-level in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Difference-in-differences estimation with a 4 year event window (pre- and post-merger) where all available observations within the window are included. Merger is a dummy indicating the post-period. Reform is a dummy indicating the treatment status constant over event time for any transaction. In Column (1) only banks merging in East-Germany, Lower Saxony, and North-Rhine-Westphalia are included. In Column (2) all merging banks are included. In Column (3) all banks are included and the treatment status of the Reform dummy lasts 8 years before and after a reform for non-merging banks. Bank controls are lagged by one year and comprise LLP, CIR, Liquidity, Loans, NII, Size, and L(GDP) at the county-level. Equity is excluded due to collinearity.

Table 5: Effect of reform on equity, and its components for merging banks.

	RoE (1)	L(Gross Eq) (2)	L(Net Eq) (3)	L(Accruals) (4)	L(Other Eq) (5)
Merger	-0.003* (0.001)	-0.014*** (0.004)	-0.006* (0.004)	-0.008 (0.008)	-0.299*** (0.116)
Reform	0.007 (0.007)	0.045 (0.040)	0.037 (0.024)	0.130 (0.113)	-1.954 (1.844)
Merger*Reform	-0.016** (0.008)	0.045 (0.042)	0.026 (0.023)	-0.115 (0.097)	2.398 (1.690)
Merger*SB	-0.014*** (0.004)	-0.021* (0.013)	-0.014 (0.010)	0.029* (0.017)	0.347* (0.197)
Reform*SB	-0.008 (0.012)	-0.250*** (0.069)	-0.039 (0.046)	-0.258* (0.142)	0.990 (1.704)
Merger*Reform*SB	0.056*** (0.013)	-0.007 (0.057)	-0.086** (0.034)	0.091 (0.124)	-3.571** (1.675)
Observations	7,300	7,300	7,300	7,300	7,300
Banks	788	788	788	788	788
Mean	0.08	17.66	17.32	15.59	14.39
Median	0.08	17.56	17.25	15.55	15.37
Standard Deviation	0.06	1.15	1.08	1.24	4.41
Bank & County Controls	yes	yes	yes	yes	yes
Bank & Year*State FE	yes	yes	yes	yes	yes
R-squared (within)	0.324	0.816	0.818	0.624	0.163

Notes: Clustered standard errors at the bank-level in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Difference-in-differences estimation with a 4 year event window (pre- and post-merger) where all available observations within the window are included. Merger is a dummy indicating the post-period. Reform is a dummy indicating the treatment status constant over event time. Controls are lagged by one year and comprise LLP, CIR, Liquidity, Loans, NII, Size, and L(GDP). Dependent variables are logarithms and defined as: *Gross Eq* is *Net Eq* plus *Accruals* plus *Other Eq*. *Net Eq* is nominal equity plus retained earnings. *Accruals* are total accruals, including accruals for pensions, taxes and those formed by loan loss provisions. *Other Eq* is other equity including subordinated debt and other tier 2 equity.

Table 6: Effect of reform on profit and its components for merging banks.

	L(Profit) (1)	L(Total Rev) (2)	L(Op Rev) (3)	L(Non-Op Rev) (4)	L(Total Cost) (5)	L(Op Cost) (6)	L(Non-Op Cost) (6)
Merger	-0.102 (0.091)	-0.007** (0.004)	-0.005 (0.003)	-0.898*** (0.166)	-0.005 (0.004)	-0.010*** (0.003)	-0.109* (0.062)
Reform	0.971 (0.916)	0.022 (0.032)	0.035 (0.029)	-1.426 (1.442)	0.017 (0.031)	0.021 (0.027)	-0.071 (0.191)
Merger*Reform	-0.174 (0.856)	0.043 (0.030)	0.027 (0.026)	2.705 (1.714)	0.049 (0.030)	0.032 (0.029)	0.028 (0.272)
Merger*SB	-0.319 (0.203)	-0.032*** (0.008)	-0.023*** (0.008)	-1.688*** (0.531)	-0.014 (0.009)	-0.005 (0.008)	0.139 (0.104)
Reform*SB	-2.749** (1.249)	-0.094** (0.038)	-0.093*** (0.036)	0.682 (1.783)	-0.071* (0.039)	-0.076** (0.035)	0.276 (0.269)
Merger*Reform*SB	3.285*** (1.223)	-0.027 (0.038)	-0.020 (0.035)	-0.915 (2.026)	-0.077** (0.038)	-0.044 (0.038)	-0.232 (0.343)
Observations	7,300	7,300	7,300	7,300	7,300	7,300	7,300
Banks	788	788	788	788	788	788	788
Mean	14.26	17.57	17.55	9.54	17.48	17.39	14.62
Median	14.99	17.49	17.47	11.81	17.39	17.3	14.74
Standard Deviation	3.6	1.08	1.08	5.71	1.08	1.07	1.96
Bank & County Controls	yes	yes	yes	yes	yes	yes	yes
Bank & Year*State FE	yes	yes	yes	yes	yes	yes	yes
R-squared (within)	0.150	0.420	0.455	0.301	0.549	0.575	0.245

Notes: Clustered standard errors at the bank-level in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Difference-in-differences estimation with a 4 year event window (pre- and post-merger) where all available observations within the window are included. Merger is a dummy indicating the post-period. Reform is a dummy indicating the treatment status constant over event time. Controls are lagged by one year and comprise LLP, CIR, Liquidity, Loans, NII, Size, and L(GDP). The dependent variables are logarithms and defined as: *Profit* is profit before taxes. *Total Rev* are total revenue and *Total Cost* are total costs. *Op Rev* are operating revenues, consisting of revenues earned on interest, commissions and fee income, revenues earned on the trading book, other operating revenues, and current revenues. *Op Cost* are operating costs, consisting of interest expenses, costs from commissions and fees, costs from the trading book, other operating costs, and administrative costs. *Non-Op Rev* are non-operating revenues consisting of appreciations and extraordinary revenues. *Non-Op Cost* are non-operating costs, consisting of depreciation and extraordinary costs.

Table 7: Effect on risk measures of merging banks.

	L(zscore) (1)	SD(RoA) (2)	Tier1 (3)	LLP (4)	NPL (5)
Merger	0.014 (0.033)	-0.000 (0.000)	0.000** (0.000)	0.000 (0.000)	0.000 (0.001)
Reform	0.460 (0.300)	-0.000 (0.001)	-0.001 (0.002)	-0.004 (0.003)	-0.046** (0.023)
Merger*Reform	-0.123 (0.274)	-0.000 (0.000)	-0.001 (0.002)	0.006* (0.004)	-0.011 (0.017)
Merger*SB	0.285*** (0.088)	-0.000** (0.000)	0.001** (0.000)	-0.001 (0.000)	0.001 (0.002)
Reform*SB	-0.197 (0.333)	-0.001 (0.001)	0.002 (0.002)	0.008** (0.004)	0.034 (0.025)
Merger*Reform*SB	-0.187 (0.292)	0.001** (0.001)	-0.003 (0.002)	-0.012*** (0.004)	0.030* (0.018)
Observations	7,206	7,206	7,300	7,300	5,153
Banks	788	788	788	788	748
Mean	3.65	0.00	0.05	0.01	0.06
Median	3.60	0.00	0.05	0.01	0.05
Standard Deviation	0.84	0.00	0.01	0.01	0.05
Bank & County Controls	yes	yes	yes	yes	yes
Bank & Year*State FE	yes	yes	yes	yes	yes
R-squared (within)	0.127	0.169	0.751	0.235	0.426

Notes: Clustered standard errors at the bank-level in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Lagged covariates are L(GDP) at the county-level, CIR, Liquidity, NII, Loans, and Size at the bank-level. In Columns (4) to (5) Equity, and in Columns (3) to (5) RoA is added as a control. LLP is excluded as a control due to endogeneity. Dependent variables are: *zscore* is defined as return on assets minus *Tier 1* ratio over $SD(RoA)$. $SD(RoA)$ is the standard deviation of return on assets calculated with a rolling window of three years which results in a drop of observations in Column (1) and (2). *Tier 1* is the ratio of regulatory Tier 1 equity to total assets. *LLP* are loan loss provisions. *NPL* are non-performing loans over total loans. *NPL* are available from 1999–2015 which causes the drop in observations and reduces the number of treated deals to 39 and the number of non-treated deals to 1,245.

Table 8: Effect on efficiency measures of merging banks.

	Branch (1)	Empl (2)	Empl/Branch (3)	Wages/Empl (4)	CIR (5)
Merger	-0.003 (0.003)	0.008 (0.005)	-0.218 (0.441)	0.001 (0.001)	-0.009*** (0.003)
Reform	-0.011 (0.062)	0.001 (0.010)	1.102 (1.750)	-0.002 (0.002)	-0.019 (0.014)
Merger*Reform	0.035 (0.041)	-0.017 (0.012)	-1.040 (1.659)	-0.008** (0.004)	0.004 (0.020)
Merger*SB	0.031*** (0.006)	-0.017* (0.009)	19.527** (9.880)	-0.001 (0.001)	0.026*** (0.005)
Reform*SB	-0.084 (0.059)	-0.021* (0.012)	8.103* (4.557)	0.007* (0.004)	0.035* (0.019)
Merger*Reform*SB	0.007 (0.045)	0.050*** (0.015)	-18.130* (9.475)	0.008* (0.004)	-0.021 (0.024)
Observations	6,958	7,228	6,958	7,228	7,300
Banks	788	788	788	788	788
Mean	0.43	0.3	10.5	0.11	0.73
Median	0.38	0.29	8.11	0.07	0.71
Standard Deviation	0.27	0.08	19.22	0.13	0.13
Bank & County Controls	yes	yes	yes	yes	yes
Bank & Year*State FE	yes	yes	yes	yes	yes
R-squared (within)	0.127	0.169	0.751	0.235	0.426

Notes: Clustered standard errors at the bank-level in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Lagged covariates are L(GDP) at the county-level, Equity, LLP, RoA, Liquidity, NII, Loans, and Size at the bank-level. In Columns (1) to (4) CIR is added as a control. Dependent variables are: *Branch* is the ratio of number of branches to total assets in millions. *Branch* is available from 1993–2012 resulting in a drop of observations in Columns (1) and (3). *Empl* is the ratio of number of employees over total assets in millions. *Empl* is missing for many banks in 2015 resulting in a drop of observations in Column (2) and (4). *Empl/Branch* is the average number of employees per branch. *Wages/Empl* is the average personnel costs spend per employee. *CIR* is the cost-income-ratio.

Table 9: Effect on market power measures of merging banks.

	NIM (1)	Int. earned (2)	Int. paid (3)	L(IBA) (4)	Market share (5)
Merger	0.000*** (0.000)	0.000*** (0.000)	0.000 (0.000)	-0.011*** (0.004)	-0.000 (0.001)
Reform	-0.001 (0.001)	-0.001 (0.001)	-0.000 (0.001)	0.034 (0.029)	0.015 (0.017)
Merger*Reform	-0.001 (0.001)	0.001 (0.001)	0.001* (0.001)	0.060* (0.032)	0.013 (0.014)
Merger*SB	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	0.000 (0.009)	0.002 (0.005)
Reform*SB	0.002 (0.001)	0.000 (0.001)	-0.002* (0.001)	-0.102*** (0.039)	-0.142*** (0.046)
Merger*Reform*SB	0.003*** (0.001)	0.003** (0.001)	-0.000 (0.001)	-0.101*** (0.039)	-0.004 (0.031)
Observations	7,300	7,300	7,300	7,300	6,965
Banks	788	788	788	788	788
Mean	0.03	0.06	0.03	20.21	0.15
Median	0.03	0.06	0.03	20.13	0.08
Standard Deviation	0.01	0.01	0.01	1.1	0.18
Bank & County Controls	yes	yes	yes	yes	yes
Bank & Year*State FE	yes	yes	yes	yes	yes
R-squared (within)	0.687	0.949	0.949	0.602	0.194

Notes: Clustered standard errors at the bank-level in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Lagged covariates are L(GDP) at the county-level, Equity, LLP, CIR, Liquidity, and Size at the bank-level. In Column (5) RoA and NII are added as control variables. Dependent variables are: *NIM* is the net-interest-margin, defined as *Int earned* minus *Int paid* over *IBA*. *Int earned* are interest revenues over total income. *Int paid* are interest costs over total income. *IBA* are interest bearing assets consisting of loans to customers and banks and securities. *Market share* is the market share of loans to customers of a bank within its business area. Business area is defined by aggregating all counties where a bank has branches. Total loans on the bank-level are split among counties according to the share of own branches located in that county. Branch data is available from 1993–2012 resulting in a drop of observations in Column (5).

Online Appendix

Table OA1: Overview of county-reforms since German reunification with the number of counties, savings and cooperative banks before and after the reform.

Date	Federal state		Counties		Deadline		Savings		Cooperatives	
12/06/1993	Brandenburg	<i>pre</i>	44		1992		30		36	
		<i>post</i>	18	-59%	1995	2	21	-30%	31	-14%
06/12/1994	Meck.-Vorp.	<i>pre</i>	37		1993		26		32	
		<i>post</i>	18	-51%	1997	3	16	-38%	26	-19%
07/01/1994	Saxony-Anhalt	<i>pre</i>	40		1993		36		41	
		<i>post</i>	24	-40%	1997	3	25	-31%	33	-20%
07/01/1994	Thuringia	<i>pre</i>	40		1993		33		50	
		<i>post</i>	22	-45%	1996	-	18	-45%	41	-18%
08/01/1994, 06/16/1996	Saxony	<i>pre</i>	54		1993		45		53	
		<i>post</i>	29	-46%	1997	2-3	24	-47%	45	-15%
07/01/2007	Saxony-Anhalt	<i>pre</i>	24		2006		22		17	
		<i>post</i>	14	-42%	2009	2	15	-32%	17	0%
08/01/2008	Saxony	<i>pre</i>	29		2007		15		25	
		<i>post</i>	13	-55%	2010	-	15	0%	24	-4%
09/04/2011	Meck.-Vorp.	<i>pre</i>	18		2010		10		11	
		<i>post</i>	8	-56%	2013	-	10	0%	11	0%

Notes: Date refers to the date of enactment. The numbers of counties are presented before and after this date. Deadline states whether there was a deadline in years and the two years representing the pre-reform and post-reform year after the deadline expired or –if no deadline was given– two years after the reform. The numbers of banks are counted in these years. Additionally, the reduction of counties and banks between respective pre- and post-years is given in percentage. In Saxony, most counties were reformed on 1st of August 1994. Law suits were filed which made three amendments to the original reform bill necessary. The last amendment was enacted on 16th of June 1996. The ordinary deadline in Saxony was two years but banks located in counties involved in the law suits were exempted.

Table OA2: Robustness checks for Return on Gross Equity.

	Baseline	Baseline RoE	Baseline RoA	90ies	00ies	Excl. Distress	Excl. Ties	Cont. Counties
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Merger	-0.003*	-0.004*	-0.000	-0.002	-0.004*	-0.002	-0.005**	-0.010**
	(0.001)	(0.002)	(0.000)	(0.002)	(0.002)	(0.002)	(0.002)	(0.005)
Reform	0.007	0.014	0.000	-0.003	0.003	0.002	0.002	0.004
	(0.007)	(0.010)	(0.000)	(0.019)	(0.010)	(0.011)	(0.010)	(0.015)
Merger*Reform	-0.016**	-0.028**	-0.001	-0.007	-0.006	-0.005	-0.012	-0.017
	(0.008)	(0.013)	(0.000)	(0.017)	(0.013)	(0.010)	(0.010)	(0.021)
Merger*SB	-0.014***	-0.021***	-0.001***	-0.013	-0.010**	-0.021***	-0.012**	-0.031
	(0.004)	(0.006)	(0.000)	(0.009)	(0.005)	(0.004)	(0.005)	(0.026)
Reform*SB	-0.008	-0.035*	-0.001**	0.001	-0.052***	-0.002	-0.006	
	(0.012)	(0.020)	(0.001)	(0.030)	(0.010)	(0.017)	(0.029)	
Merger*Reform*SB	0.056***	0.103***	0.003***	0.060***	-0.011	0.046***	0.078***	0.076**
	(0.013)	(0.022)	(0.001)	(0.021)	(0.013)	(0.017)	(0.017)	(0.036)
Observations	7,300	7,300	7,300	2,513	4,787	4,220	5,428	485
Banks	788	788	788	632	724	501	591	63
Savings Banks	163	163	163	124	128	123	121	19
Cooperative Banks	625	625	625	508	596	378	470	44
Treated Deals	74	74	74	60	20	44	46	20
Non-treated Deals	1,553	1,553	1,553	801	1,162	800	1,173	90
Mean	0.078	0.11	0.006	0.089	0.067	0.085	0.08	0.062
Median	0.078	0.11	0.006	0.093	0.065	0.085	0.079	0.065
Standard Deviation	0.062	0.089	0.005	0.059	0.063	0.056	0.064	0.072
Bank & County Controls	yes	yes	yes	yes	yes	yes	yes	yes
Bank & Year*State FE	yes	yes	yes	yes	yes	yes	yes	no
R-squared (within)	0.324	0.326	0.326	0.354	0.260	0.403	0.328	0.467

Notes: Clustered standard errors at the bank-level in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. In Column (4) the sample period is 1994 to 2000. In column(5) the sample period is 2001 to 2015. In Column (6) all banks that once reported a distress event are excluded. In Column (7) all banks with a ratio of loans to municipalities to total loans above their banking groups' average ratio are excluded. In Column (8) only banks on the borders between reformed and non-reformed states are included. Fixed effects for each neighboring county-pair are added. Controls are lagged by one year and comprise LLP, CIR, Liquidity, Loans, NII, and Size at the bank-level, and L(GDP) at the county-level.

Table OA3: Robustness checks for Return on Gross Equity.

	Baseline	Collapse Residual	Min 1 Pre	No Attr. Post
	(1)	(2)	(3)	(4)
SB		-0.015 (0.009)		
Merger	-0.003* (0.001)	-0.020** (0.009)	-0.003* (0.002)	-0.005** (0.002)
Reform	0.007 (0.007)		0.004 (0.008)	-0.012 (0.009)
Merger*Reform	-0.016** (0.008)		-0.010 (0.010)	0.032* (0.018)
Merger*SB	-0.014*** (0.004)	0.032*** (0.011)	-0.012*** (0.004)	-0.012*** (0.005)
Reform*SB	-0.008 (0.012)		-0.013 (0.013)	0.014 (0.018)
Merger*Reform*SB	0.056*** (0.013)		0.057*** (0.015)	0.015 (0.019)
Observations	7,300	310	6,119	5,358
Banks	788		754	756
Savings Banks	163	43	151	159
Cooperative Banks	625	24	603	597
Treated Deals	74	74	55	50
Non-treated Deals	1,553		1,132	945
Mean	0.078	0.061	0.078	0.074
Median	0.078	0.061	0.078	0.073
Standard Deviation	0.062	0.047	0.062	0.065
Bank & County Controls	yes	yes	yes	yes
Bank & Year*State FE	yes	no	yes	yes
R-squared (within)	0.324	0.039	0.312	0.284

Notes: Clustered standard errors at the bank-level in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. In Column (2) all variables are collapsed per transaction for the pre- and post-period. Bank fixed effects and merger-year \times state fixed effects are added. Standard errors stay clustered at the bank-level. In Column (3) the residuals of a regression of RoE on Reform-Treatment, Year*State fixed effects, and the main covariates are regressed on the post-dummy for treated deals only, following Bertrand et al. (2004). In Column (4) transactions are included only if the merging bank can be observed in at least one pre-merger year. In Column (5) transactions are included only if the merging bank can be observed in all four post-merger years and at least one pre-merger year. Controls are lagged by one year and comprise LLP, CIR, Liquidity, Loans, NII, and Size at the bank-level, and L(GDP) at the county-level.

Table OA4: Average rejection rates for 1000 repetitions of Placebo-treatments over the cross-section and time.

	Return on Equity
Rejection rate at 1%	0.013
Rejection rate at 5%	0.069
Rejection rate at 10%	0.114

Notes: Each repetition where *Reform* was randomly assigned on other mergers among all mergers including the actually treated tests H_0 : $\beta_{Merger*Reform*Public} = 0$.

Table OA5: Decomposition of gross equity.

	L(Gross Eq)	L(Nom Eq)	Net Equity		L(Current R)	L(A Pension)	Accruals		L(Special Items)	Other Equity	L(Participate)
	(1)	(2)	L(Retained E)	L(Other R)	(3)	(3)	L(A Taxes)	L(A Risk)	(3)	L(Subordinated)	(3)
Merger	-0.014*** (0.004)	0.002 (0.032)	-0.170 (0.114)	-0.012** (0.005)	-0.008 (0.017)	0.017 (0.038)	-0.581*** (0.118)	-0.035*** (0.011)	0.005 (0.174)	-0.396*** (0.151)	-0.011 (0.150)
Reform	0.045 (0.040)	0.708 (0.694)	-0.926 (1.134)	0.002 (0.036)	-0.394 (0.338)	-1.665 (1.698)	0.246 (0.577)	0.009 (0.136)	-1.139 (0.713)	0.425 (2.342)	1.188 (2.259)
Merger*Reform	0.045 (0.042)	-0.316 (0.502)	0.600 (0.848)	0.047 (0.033)	0.344 (0.278)	1.436 (1.371)	-0.383 (0.576)	0.044 (0.104)	1.836*** (0.680)	0.362 (2.062)	-0.250 (1.789)
Merger*SB	-0.021* (0.013)	0.065 (0.371)	-0.158 (0.284)	-0.096*** (0.032)	-0.160 (0.102)	-0.104* (0.057)	0.218 (0.315)	0.264*** (0.030)	-1.360*** (0.423)	1.720*** (0.249)	0.838* (0.458)
Reform*SB	-0.250*** (0.069)	-1.341 (1.085)	3.440** (1.333)	-0.093 (0.067)	0.575 (0.550)	1.527 (1.298)	-0.536 (0.637)	-0.174 (0.198)	0.024 (1.378)	-1.381 (2.038)	-4.569** (2.201)
Merger*Reform*SB	-0.007 (0.057)	-0.193 (0.715)	0.288 (0.972)	0.037 (0.051)	-0.244 (0.607)	-1.399 (1.247)	1.423** (0.640)	-0.368** (0.145)	0.519 (0.954)	-2.660 (1.818)	-0.650 (1.823)
Observations	7,300	7,300	7,300	7,300	7,300	7,300	7,300	7,300	7,300	7,300	7,300
Banks	788	788	788	788	788	788	788	788	788	788	788
Mean	17.66	13.79	1.67	16.93	13.86	14.2	11.84	14.79	5.12	10.92	7.38
Median	17.56	15.54	0.00	16.82	13.84	14.73	12.7	14.77	0.00	14.37	10.24
Standard Deviation	1.15	5.25	4.48	1.19	1.32	3.02	3.65	1.13	6.2	7.06	7.37
Bank & County Controls	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Bank & Year*State FE	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
R-squared (within)	0.816	0.147	0.281	0.728	0.084	0.193	0.177	0.445	0.415	0.280	0.356

Notes: Clustered standard errors at the bank-level in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Dependent variables are logarithms and defined as: *Nom Eq* is nominal equity. *Retained E* are retained earnings. *Other R* are other retained earnings. *Current R* are retained earnings from the current accounting period. *A Pensions* are accruals for pensions. *A Taxes* are accruals for taxes. *A Risk* are other accruals including those formed by loan loss provisions. *Subordinated* is subordinated debt. *Participate* are debt obligations that participate in profits. *Special Items* are special items due to currency conversion and the funds for banking risk. Bank controls are lagged by one year and comprise LLP, CIR, Liquidity, Loans, NII, size, and L(GDP).

Table OA6: Decomposition of total revenues.

	L(Total Rev)	Operating Revenue				Non-operating Revenue		
	(1)	L(Int Rev)	L(Com Rev)	L(Fin Rev)	L(Other Rev)	L(Curr Rev)	L(Appr Rev)	L(Exord Rev)
	(1)	(2)	(3)	(3)	(3)	(3)	(3)	(3)
Merger	-0.007** (0.004)	-0.008** (0.003)	0.004 (0.004)	-0.360*** (0.125)	0.020 (0.021)	0.019 (0.024)	-1.016*** (0.174)	-0.314** (0.143)
Reform	0.022 (0.032)	0.023 (0.032)	0.011 (0.027)	1.098 (1.226)	-0.035 (0.125)	0.067 (0.439)	-0.822 (1.451)	-2.322 (1.988)
Merger*Reform	0.043 (0.030)	0.065** (0.032)	0.003 (0.027)	0.623 (1.402)	-0.066 (0.162)	-0.448 (0.444)	1.986 (1.459)	2.355 (2.204)
Merger*SB	-0.032*** (0.008)	-0.007 (0.008)	-0.023** (0.009)	0.182 (0.292)	-0.162*** (0.040)	-0.164*** (0.056)	-1.371*** (0.528)	-0.124 (0.294)
Reform*SB	-0.094** (0.038)	-0.092** (0.038)	-0.013 (0.038)	-3.846** (1.538)	0.027 (0.156)	0.090 (0.621)	-0.285 (1.782)	1.701 (1.996)
Merger*Reform*SB	-0.027 (0.038)	-0.050 (0.039)	-0.010 (0.037)	-0.093 (1.519)	0.011 (0.184)	0.087 (0.498)	-0.824 (1.874)	-1.672 (2.122)
Observations	7,300	7,300	7,300	7,300	7,300	7,300	7,300	7,300
Banks	788	788	788	788	788	788	788	788
Mean	17.57	17.38	15.25	7.79	13.41	13.24	8.89	1.99
Median	17.49	17.3	15.27	9.89	13.39	13.1	11.45	0.00
Standard Deviation	1.08	1.07	1.14	5.25	1.41	1.87	5.82	4.69
Bank & County Controls	yes	yes	yes	yes	yes	yes	yes	yes
Bank & Year*State FE	yes	yes	yes	yes	yes	yes	yes	yes
R-squared (within)	0.420	0.629	0.800	0.472	0.324	0.414	0.297	0.266

Notes: Clustered standard errors at the bank-level in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Dependent variables are logarithms and defined as: *Int Rev* are revenues earned on interest bearing assets. *Com Rev* are revenues earned on commissions and fees. *Fin Rev* are revenues earned on the trading book. *Other Rev* are other operating revenues. *Curr Rev* are current revenues. *Appr Rev* are revenues earned on appreciations. *Exord Rev* are extraordinary revenues. Bank controls are lagged by one year and comprise LLP, CIR, Liquidity, Loans, NII, size, and L(GDP).

Table OA7: Decomposition of total costs.

	L(Total Cost)	L(Int Cost)	L(Com Cost)	Operating Costs		Non-operating Costs		
	(1)	(2)	(3)	L(Fin Cost)	L(Other Cost)	L(Admin Cost)	L(Depr Cost)	L(Exord Cost)
	(1)	(2)	(3)	(3)	(3)	(3)	(3)	(3)
Merger	-0.005 (0.004)	-0.015*** (0.005)	0.001 (0.009)	-0.315** (0.144)	0.005 (0.027)	-0.006* (0.003)	-0.163** (0.066)	0.070 (0.127)
Reform	0.017 (0.031)	0.019 (0.037)	0.192*** (0.072)	0.825 (1.190)	-0.251* (0.152)	0.032 (0.026)	-0.042 (0.417)	0.234 (1.365)
Merger*Reform	0.049 (0.030)	0.114** (0.046)	-0.035 (0.075)	0.758 (1.202)	0.293 (0.180)	-0.041 (0.027)	-0.508 (0.796)	0.454 (1.829)
Merger*SB	-0.014 (0.009)	0.027** (0.011)	0.015 (0.034)	-0.297 (0.333)	0.048 (0.050)	-0.012* (0.007)	0.264** (0.110)	-0.453 (0.347)
Reform*SB	-0.071* (0.039)	-0.147*** (0.053)	-0.238** (0.095)	-3.523*** (1.222)	0.174 (0.182)	-0.003 (0.031)	0.099 (0.525)	0.567 (1.526)
Merger*Reform*SB	-0.077** (0.038)	-0.134** (0.055)	0.046 (0.113)	-0.469 (1.256)	-0.449** (0.200)	0.027 (0.035)	0.366 (0.835)	-0.644 (1.898)
Observations	7,300	7,300	7,300	7,300	7,300	7,300	7,300	7,300
Banks	788	788	788	788	788	788	788	788
Mean	17.48	16.72	12.64	2.77	12.46	16.58	14.57	1.66
Median	17.39	16.62	12.66	0.00	12.45	16.52	14.7	0.00
Standard Deviation	1.08	1.14	1.13	4.79	1.78	1.02	2.02	4.22
Bank & County Controls	yes	yes	yes	yes	yes	yes	yes	yes
Bank & Year*State FE	yes	yes	yes	yes	yes	yes	yes	yes
R-squared (within)	0.549	0.831	0.677	0.239	0.300	0.456	0.247	0.283

Notes: Clustered standard errors at the bank-level in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Dependent variables are logarithms and defined as: *Int Cost* are costs paid on interest bearing assets. *Com Cost* are costs paid on commissions and fees. *Fin Cost* are costs paid on the trading book. *Other Cost* are other operating costs. *Admin Cost* are administrative costs. *Depr Cost* are costs paid on depreciations. *Exord Cost* are extraordinary costs. Bank controls are lagged by one year and comprise LLP, CIR, Liquidity, Loans, NII, size, and L(GDP).

Table OA8: Decomposition of net interest margin.

	NIM	L(IBA)	Interest Bearing Assets		
			L(Interbank)	L(Costumer)	L(Bonds & Sec)
	(1)	(2)	(3)	(3)	(3)
Merger	0.000*** (0.000)	-0.013*** (0.003)	-0.008** (0.003)	-0.015*** (0.005)	-0.100*** (0.015)
Reform	-0.001 (0.001)	0.039 (0.030)	0.023 (0.032)	0.019 (0.037)	-0.057 (0.128)
Merger*Reform	-0.001 (0.001)	0.057* (0.033)	0.065** (0.032)	0.114** (0.046)	0.125 (0.111)
Merger*SB	-0.000** (0.000)	0.003 (0.008)	-0.007 (0.008)	0.027** (0.011)	0.087 (0.068)
Reform*SB	0.002** (0.001)	-0.109*** (0.038)	-0.092** (0.038)	-0.147*** (0.053)	0.023 (0.164)
Merger*Reform*SB	0.003*** (0.001)	-0.096** (0.039)	-0.050 (0.039)	-0.134** (0.055)	-0.393*** (0.140)
Observations	7,300	7,300	7,300	7,300	7,300
Banks	788	788	788	788	788
Mean	0.03	20.21	17.38	16.72	18.04
Median	0.03	20.13	17.3	16.62	18.0
Standard Deviation	0.01	1.1	1.07	1.14	1.15
Bank & County Controls	yes	yes	yes	yes	yes
Bank & Year*State FE	yes	yes	yes	yes	yes
R-squared (within)	0.693	0.594	0.629	0.831	0.194

Notes: Clustered standard errors at the bank-level in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Dependent variables are logarithms and defined as: *IBA* are interest bearing assets, consisting of *Interbank*, *Customer*, and *Bonds & Sec*. *Interbank* are total loans to credit institutions. *Customer* are total loans to customers. *Bonds & Sec* are total of bonds and securities. Bank controls are lagged by one year and comprise LLP, CIR, Liquidity, Loans, NII, size, and L(GDP).

Table OA9: Summary statistics of dependent variables in the pre-period by ownership and treatment status.

	Non-T (1)	Savings Treat (2)	Diff. (3)	Non-T (4)	Cooperatives Treat (5)	Diff. (6)	Diff. Non-T (7)	Diff. T (8)	Diff. Diff. (9)
<i>Levels</i>									
<i>Equity Decomposition</i>									
L(Gross Eq)	19.166	18.585	0.581	17.347	17.352	-0.005	1.820	1.233	-0.586
	0.771	0.823	0.000	0.961	0.968	0.980	0.000	0.000	0.016
L(Net Eq)	18.665	18.038	0.628	17.037	17.029	0.008	1.629	1.009	-0.620
	0.780	0.743	0.000	0.912	0.978	0.972	0.000	0.000	0.010
L(Accruals)	17.036	16.248	0.789	15.292	15.432	-0.141	1.744	0.815	-0.929
	0.757	0.920	0.000	1.106	0.983	0.532	0.000	0.003	0.000
L(Other Eq)	17.387	17.287	0.100	13.762	11.529	2.233	3.625	5.758	2.133
	2.283	1.236	0.619	4.468	6.891	0.164	0.000	0.001	0.160
<i>Profit Decomposition</i>									
L(Profit)	15.941	13.503	2.437	13.952	13.873	0.079	1.989	-0.369	-2.358
	2.967	5.819	0.004	3.566	3.514	0.921	0.000	0.743	0.034
L(Total Rev)	19.021	18.514	0.507	17.265	17.333	-0.067	1.756	1.181	-0.575
	0.760	0.603	0.000	0.887	0.908	0.745	0.000	0.000	0.008
L(Op Rev)	19.006	18.507	0.499	17.247	17.305	-0.059	1.759	1.201	-0.558
	0.758	0.599	0.000	0.885	0.906	0.776	0.000	0.000	0.010
L(Non-Op Rev)	11.072	8.377	2.694	9.256	10.251	-0.995	1.816	-1.874	-3.689
	6.015	6.530	0.006	5.578	5.707	0.447	0.000	0.237	0.018
L(Total Cost)	18.931	18.431	0.500	17.170	17.246	-0.076	1.761	1.184	-0.577
	0.761	0.608	0.000	0.880	0.886	0.705	0.000	0.000	0.007
L(Op Cost)	18.829	18.262	0.566	17.087	17.121	-0.034	1.741	1.141	-0.600
	0.759	0.627	0.000	0.875	0.895	0.867	0.000	0.000	0.006
L(Non-Op Cost)	16.423	16.445	-0.022	14.221	14.891	-0.670	2.202	1.554	-0.648
	0.990	0.713	0.839	1.898	1.209	0.024	0.000	0.000	0.024
<i>Risk Channel</i>									
L(zscore)	3.217	3.165	0.053	3.364	3.652	-0.288	-0.147	-0.488	-0.341
	0.655	0.453	0.517	0.638	0.969	0.269	0.000	0.080	0.182
SD(RoA)	0.002	0.002	0.000	0.002	0.002	0.000	0.000	-0.000	-0.000
	0.002	0.001	0.400	0.002	0.002	0.920	0.651	0.935	0.877
Tier1	0.044	0.038	0.005	0.050	0.045	0.005	-0.006	-0.006	-0.001
	0.010	0.011	0.001	0.012	0.010	0.043	0.000	0.020	0.802
LLP	0.009	0.024	-0.016	0.007	0.010	-0.003	0.001	0.014	0.013
	0.007	0.014	0.000	0.009	0.007	0.070	0.000	0.000	0.000
NPL	0.063	0.100	-0.037	0.061	0.097	-0.036	0.002	0.002	0.000
	0.039	0.045	0.000	0.046	0.073	0.088	0.452	0.911	0.981
<i>Efficiency Channel</i>									
Branch	0.213	0.305	-0.092	0.480	0.656	-0.176	-0.268	-0.352	-0.084
	0.113	0.117	0.000	0.273	0.343	0.033	0.000	0.000	0.273
Empl	0.252	0.304	-0.052	0.305	0.359	-0.053	-0.053	-0.055	-0.002
	0.047	0.088	0.000	0.083	0.097	0.023	0.000	0.035	0.950
Empl/Branch	22.665	10.641	12.024	8.093	6.394	1.699	14.572	4.247	-10.325
	44.738	3.148	0.000	4.424	2.111	0.002	0.000	0.000	0.000
Wages/Empl	0.017	0.020	-0.003	0.128	0.087	0.041	-0.111	-0.067	0.043
	0.014	0.010	0.103	0.130	0.063	0.011	0.000	0.000	0.002
CIR	0.669	0.630	0.039	0.739	0.737	0.002	-0.070	-0.107	-0.037
	0.068	0.068	0.000	0.139	0.080	0.900	0.000	0.000	0.067
<i>Market Power Channel</i>									
NIM	0.024	0.031	-0.006	0.029	0.031	-0.002	-0.005	-0.000	0.005
	0.004	0.009	0.000	0.005	0.006	0.251	0.000	0.997	0.010
Int earned	0.060	0.061	-0.001	0.061	0.059	0.002	-0.001	0.002	0.003
	0.009	0.015	0.767	0.011	0.015	0.567	0.267	0.603	0.507
Int paid	0.036	0.030	0.006	0.032	0.028	0.004	0.004	0.002	-0.002
	0.007	0.009	0.000	0.009	0.010	0.136	0.000	0.440	0.407
L(IBA)	21.651	21.121	0.530	19.903	19.882	0.021	1.748	1.239	-0.509
	0.776	0.646	0.000	0.906	0.903	0.918	0.000	0.000	0.020
Market share	0.442	0.481	-0.039	0.081	0.091	-0.010	0.360	0.390	0.029
	0.210	0.210	0.202	0.061	0.044	0.327	0.000	0.000	0.354

Table OA9: continued.

	Non-T (1)	Savings Treat (2)	Diff. (3)	Non-T (4)	Cooperatives Treat (5)	Diff. (6)	Diff. Non-T (7)	Diff. T (8)	Diff. Diff. (9)
<i>First-Differences</i>									
<i>Equity Decomposition</i>									
L(Gross Eq)	0.056	0.092	-0.036	0.060	0.071	-0.011	-0.004	0.021	0.025
	0.071	0.113	0.028	0.058	0.087	0.592	0.230	0.406	0.310
L(Net Eq)	0.050	0.035	0.016	0.056	0.054	0.002	-0.006	-0.019	-0.014
	0.056	0.029	0.001	0.042	0.047	0.842	0.034	0.096	0.230
L(Accruals)	0.044	0.107	-0.063	0.044	0.057	-0.013	-0.000	0.050	0.050
	0.151	0.370	0.227	0.195	0.239	0.814	0.985	0.503	0.494
L(Other Eq)	0.068	1.406	-1.338	0.230	0.030	0.199	-0.162	1.375	1.537
	1.588	3.859	0.015	2.374	0.415	0.067	0.067	0.013	0.004
<i>Equity Decomposition</i>									
L(Profit)	-0.350	-1.423	1.073	-0.007	0.148	-0.154	-0.344	-1.570	-1.227
	2.970	6.879	0.266	3.081	0.638	0.332	0.024	0.106	0.201
L(Total Rev)	0.012	0.011	0.001	0.002	0.027	-0.025	0.010	-0.016	-0.025
	0.073	0.060	0.946	0.078	0.093	0.248	0.010	0.489	0.251
L(Op Rev)	0.008	0.013	-0.005	-0.000	0.017	-0.018	0.009	-0.004	-0.013
	0.062	0.055	0.577	0.043	0.057	0.181	0.004	0.767	0.376
L(Non-Op Rev)	0.609	-0.716	1.325	0.027	0.749	-0.722	0.583	-1.465	-2.047
	6.451	6.956	0.190	6.628	7.674	0.679	0.077	0.461	0.294
L(total Cost)	0.017	0.015	0.002	-0.000	0.013	-0.013	0.017	0.002	-0.015
	0.086	0.084	0.876	0.079	0.104	0.575	0.000	0.934	0.555
L(Op Cost)	0.011	-0.012	0.023	-0.001	-0.006	0.005	0.012	-0.007	-0.019
	0.073	0.076	0.038	0.060	0.061	0.744	0.001	0.707	0.281
L(Non-Op Cost)	0.088	0.242	-0.154	-0.026	0.153	-0.179	0.114	0.089	-0.025
	0.672	0.787	0.175	1.859	1.356	0.564	0.021	0.785	0.937
<i>Risk Channel</i>									
L(zscore)	-0.058	-0.041	-0.018	-0.003	-0.066	0.063	-0.055	0.026	0.081
	0.430	0.458	0.832	0.466	0.414	0.580	0.018	0.852	0.550
SD(RoA)	0.000	0.000	-0.000	0.000	0.000	0.000	0.000	0.000	0.000
	0.001	0.001	0.718	0.001	0.001	0.753	0.079	0.344	0.621
Tier1	0.001	0.002	-0.001	0.002	0.001	0.001	-0.001	0.002	0.002
	0.003	0.003	0.003	0.003	0.004	0.439	0.000	0.179	0.045
LLP	0.000	0.004	-0.003	-0.000	-0.002	0.002	0.000	0.006	0.006
	0.007	0.015	0.102	0.009	0.009	0.300	0.260	0.040	0.049
NPL	0.001	-0.009	0.010	-0.002	-0.027	0.025	0.003	0.019	0.015
	0.013	0.020	0.009	0.024	0.033	0.013	0.002	0.065	0.098
<i>Efficiency Channel</i>									
Branch	-0.012	-0.017	0.004	-0.028	-0.058	0.031	0.015	0.042	0.026
	0.016	0.030	0.314	0.045	0.083	0.117	0.000	0.040	0.157
Empl	-0.010	-0.005	-0.005	-0.006	0.015	-0.021	-0.004	-0.020	-0.016
	0.016	0.054	0.543	0.063	0.109	0.435	0.008	0.476	0.550
Empl/Branch	2.067	0.249	1.818	0.208	0.303	-0.095	1.859	-0.054	-1.913
	14.005	1.450	0.009	1.758	0.998	0.702	0.005	0.871	0.009
Wages/Empl	-0.000	-0.001	0.000	-0.016	-0.066	0.051	0.016	0.066	0.050
	0.001	0.005	0.706	0.176	0.270	0.452	0.000	0.330	0.431
CIR	0.007	-0.031	0.039	0.004	-0.027	0.030	0.004	-0.005	-0.008
	0.057	0.094	0.005	0.141	0.058	0.033	0.356	0.794	0.648
<i>Market Power Channel</i>									
NIM	-0.001	-0.001	0.000	-0.001	-0.001	0.000	-0.000	0.000	0.000
	0.002	0.002	0.856	0.002	0.003	0.417	0.056	0.709	0.504
Int earned	-0.002	-0.004	0.002	-0.003	-0.004	0.002	0.000	-0.000	-0.001
	0.003	0.006	0.011	0.003	0.006	0.262	0.001	0.935	0.701
Int paid	-0.001	-0.003	0.002	-0.002	-0.003	0.001	0.001	-0.000	-0.001
	0.003	0.005	0.009	0.003	0.005	0.358	0.000	0.776	0.431
L(IBA)	0.035	0.053	-0.018	0.034	0.058	-0.024	0.001	-0.005	-0.006
	0.060	0.076	0.095	0.045	0.071	0.148	0.812	0.790	0.759
Market share	0.003	0.003	-0.000	-0.000	0.000	-0.001	0.003	0.003	-0.000
	0.025	0.049	0.953	0.007	0.007	0.647	0.005	0.657	0.966

Notes: Tier1, NPL, Branch, Empl, Salaries, and Admin are defined as ratios to total assets. NIM, I-Inc., and I-Cost are defined as ratios relative to interest-bearing assets. NI-Inc. and NI-Cost are defined relative to total income.

Table OA10: Observations, number of banks, and deals each year for the full sample of banks according to treatment and ownership status.

	Non-Merging					Merging								
	Observations				Banks	Observations				Banks	Deals			
	Savings		Cooperatives			Savings		Cooperatives			Savings		Cooperatives	
	Non-T	Treat	Non-T	Treat	Total	Non-T	Treat	Non-T	Treat	Total	Non-T	Treat	Non-T	Treat
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
1993											13	2	74	2
1994	204	6	342	15	567	26	18	239	7	290	7	11	62	7
1995	204	6	345	15	570	37	18	322	10	387	1	19	43	8
1996	204	6	345	15	570	43	31	362	12	448	6	6	62	4
1997	210	6	344	16	576	56	37	389	14	496	6	1	68	0
1998	210	6	343	16	575	57	35	361	4	457	4	0	110	0
1999	210	6	340	18	574	67	25	343	0	435	11	0	126	0
2000	209	7	339	19	574	73	6	321	0	400	15	0	175	0
2001	239	12	368	24	643	83	2	408	1	494	19	0	125	0
2002	239	12	367	25	643	85	1	420	2	508	17	0	102	0
2003	242	9	375	17	643	75	0	412	0	487	27	1	83	2
2004	242	9	375	17	643	84	5	402	2	493	13	0	53	0
2005	242	9	376	17	644	74	6	346	2	428	14	0	42	0
2006	242	9	374	17	642	68	7	285	3	363	7	0	31	0
2007	237	9	374	17	637	58	8	231	3	300	4	0	21	0
2008	237	9	374	17	637	43	3	175	2	223	2	4	33	0
2009	237	9	374	17	637	35	5	152	1	193	5	2	36	1
2010	240	6	377	14	637	26	7	165	2	200	1	1	17	1
2011	240	6	377	14	637	19	8	162	3	192	3	0	17	0
2012	240	6	377	14	637	16	8	143	3	170	2	0	18	0
2013	240	6	377	14	637	14	3	122	2	141	4	1	19	1
2014	240	6	376	14	636	12	2	90	1	105	1	0	29	0
2015	240	6	374	14	634	9	1	80	0	90	3	0	22	0
Total	5,048	166	8,013	366	13,593	1,060	236	5,930	74	7,300	185	48	1,368	26

Notes: In Columns (1) to (4), and (6) to (9) observations of synthetic or original banks are counted. In Columns (5), and (10) observations are summed up per year. In Columns (11) to (14) mergers are counted in the year when they occurred.

Table OA11: Observations, number of banks, and deals each year for the sample of merging banks in reformed states according to treatment and ownership status.

	Observations				Banks	Deals			
	Savings		Cooperatives			Savings		Cooperatives	
	Non-T (1)	Treat (2)	Non-T (3)	Treat (4)		Total (5)	Non-T (6)	Treat (7)	Non-T (8)
1993						7	2	13	2
1994	12	18	48	7	85	0	11	8	7
1995	10	18	63	10	101	0	19	6	8
1996	8	31	71	12	122	3	6	10	4
1997	10	37	73	14	134	4	1	18	0
1998	13	35	77	4	129			31	0
1999	22	25	82	0	129	3	0	33	0
2000	28	6	81	0	115	5	0	59	0
2001	40	2	138	1	181	4	0	44	0
2002	32	1	146	2	181	10	0	31	0
2003	28	0	139	0	167	15	1	31	2
2004	34	5	143	2	184	8	0	17	0
2005	33	6	119	2	160	7	0	14	0
2006	34	7	100	3	144	3	0	6	0
2007	29	8	80	3	120	1	0	8	0
2008	20	3	61	2	86	0	4	10	0
2009	15	5	58	1	79	2	2	7	1
2010	10	7	52	2	71	0	1	7	1
2011	7	8	50	3	68	1	0	8	0
2012	5	8	44	3	60	2	0	6	0
2013	6	3	37	2	48	1	1	7	1
2014	5	2	34	1	42			9	0
2015	3	1	31	0	35	2	0	5	0
Total	404	236	1,727	74	2,441	78	48	388	26

Notes: In Columns (1) to (4) observations of synthetic or original banks are counted. In Column (5) observations are summed up per year. In Columns (6) to (9) mergers are counted in the year when they occurred.

Table OA12: Description of the main variables. (*For internal use.*)

Variable	Name	Description	BBK-Position	Availability, Corrections
<i>Main dependent variables</i>				
RoA	Return on Assets	Profit before Taxes (pbt) / Total Assets	pbt/ejb_128	
RoE	Return on Net Equity	Profit before Taxes (pbt) / Total Net Equity	pbt/ ejb_256	
RoE	Return on Gross Equity	Profit before Taxes (pbt) / Total Gross Equity	pbt/ GrossEq	
<i>Main independent variables</i>				
L(GDP)	Log (county GDP)	Logarithm of GDP per county		1993–2014; Lower-Saxony, Meck.-Vorp. 1999–2014
Equity	Net Equity Ratio	Net Equity /Total Assets	ejb_256/ejb_128	
LLP	Loan Loss Provisions	Loan Loss Provisions/ Total Loans	egv_18/ejb_52	
CIR	Cost-Income-Ratio	Administrative Costs / Operating Income , (Net Int+Comm+Trading+Other+current rev)	Admin/(Op Inc + egv_39+40)	
Liquidity	Liquidity Ratio	Liquid Assets (Cash + Accounts receivable of banks with daily maturity) /Total Assets	(ejb_5 + ejb_11) /ejb_128	
Loans	Loans-Ratio	Total Loans to (Non-Bank) Costumers / Total Assets	ejb_52/ejb_128	
NII	Non-Interest-Income Ratio	Non-Interest Income to Operating Income	(egv_45-egv_6)/Op Inc	
Size	Size	Quintile of Total Asset Distribution of resp. banking group	ejb_128, savings	

Table OA12: continued.

Variable	Name	Description	BBK-Position	Availability, Corrections
<i>Equity Decomposition</i>				
L(Gross Eq)	Log (Gross Equity)	Logarithm of Net Equity + Total Accruals + Tier 2 + Special items	ejb_256+234+235 +236+274+237+240+242	
L(Net Eq)	Log (Net Equity)	Logarithm of Total Net Equity	ejb_256	
L(Accruals)	Log (Total Accruals)	Logarithm of Accruals for Pensions + Tax Accruals + other Accruals, incl. made by LLP	ejb_233+234+235	
L(Other Eq)	Log (Other Equity)	Logarithm of Subordinated Debt (+Genussrecht)+ Special items + Fonds for Banking Risk	ejb_234-36+237 +240+242	
<i>Profit Decomposition</i>				
L(Profits)	Log (Profits before taxes)	Operating + Non-operating Result	pbt	
L(Total Rev)	Log (Total Revenues)	Operating + Non-operating Revenues		
L(Op Rev)	Log (Operating Revenues)	Revenue earned on IBA + on Commissions + on the Trading Book + Other Operating Revenue + Current Revenues	egv_35+45+ 46+51+39+40	
L(Non-Op Rev)	Log (Non-operating Revenues)	Extraordinary Revenue + Appreciations+ Special items	egv_54+48+49+53	
L(Total Cost)	Log (Total Costs)	Operating + Non-operating Costs		
L(Op Cost)	Log (Operating Costs)	Costs paid on IBA + on Commissions + on the Trading Book + Other Operating + Administrative Costs	egv_4+6+7+17 12+13+15+25	
L(Non-Op Cost)	Log (Non-operating Costs)	Extraordinary Costs + Depreciations+ Special items	egv_18+19+21+22+23	

The table continues on the next page.

Table OA12: continued.

Variable	Name	Description	BBK-Position	Availability, Corrections
<i>Risk Channel</i>				
L(z-score)	Log (z-score)	Logarithm of z-score, based on 5 year Standard deviation of RoA, and Tier1 Equity	(RoA + Tier1) / SDRoA(5yr)	available 1995–2013; outliers corrected (> 4000)
SDRoA	Standard Deviation of RoA	Standard Deviation of RoA based on a 5 year rolling window (min. 3 years available)	roa (mvsumm)	
L(Tier1)	Log (Tier 1 Regulatory Capital)	Logarithm of Tier1 regulatory capital	sa34_20,44,45,48,45,48,51,52 EUEB096001,EC0100015010	available 1994–2015
Tier1	Tier 1 Capital Ratio	Tier1 / Total Assets	Tier1 / ejb_128	available 1994–2015
LLP	Loan Loss Provisions	Loan Loss Provisions/ Total Loans	egv_18/ejb_52	
L(NPL)	Log (Non-Performing-Loans)	Logarithm of Non-Performing-Loans	SON0_53 or (SON01_409 +411+415+417)	available 1999–2015
NPL	Non-Performing-Loans Ratio	Non-Performing-Loans / Total Gross Loans to Costumers	SON0_53/52; (4_09+11+15+17) /(74+80+86+4_12+18+14+20)	available 1999–2015
<i>Cost Channel</i>				
Branch	Branch Ratio	Number of Branches / Total Assets (in Mil.)	Branch1 from Koetter/Kick /ejb_128/1000000	available 1993–2012
Empl	Employees Ratio	Number of Employees / Total Assets (in Mil.)	SON01_1 / ejb_128 / 1000000	
Empl/Branch	Employees per Branch	Employees/Branches	SON01_1/Branch1	available 1993–2012; outliers corrected (> 1000)
Wages/Empl	Wage costs per employee	Personnel Costs per Employee / Total Assets (in Ths.)	((egv_9/employees) / ejb_128)*1000	
CIR	Cost-Income-Ratio	Administrative Costs / Operating Income (see above)	cir	

Table OA12: continued.

Variable	Name	Description	BBK-Position	Availability, Corrections
<i>Market Power Channel</i>				
NIM	Net Interest Margin	Net Interest Income/ Interest bearing Assets (iba)	(egv_35 - egv_3)/iba	
I-Inc	Average Interest earned on IBA	Interest Income / Interest bearing Assets (iba)	egv_35/iba	
I-Cost	Average Interest paid on IBA	Interest Costs / Interest bearing Assets (iba)	egv_3/iba	
Market share	Market share of loans	Market share of loans in the area defined by all counties where the bank operates branches	ejb_52, AGS of branch1	available 1993–2012