SFB 649 Discussion Paper 2014-070

The Politics of Related Lending

Michael Halling*
Pegaret Pichler**
Alex Stomper***

* Stockholm School of Economics, Sweden and
University of Utah, United States of America
** Northeastern University, United States of America
***Humboldt-Universität zu Berlin, Germany

This research was supported by the Deutsche Forschungsgemeinschaft through the SFB 649 "Economic Risk".

http://sfb649.wiwi.hu-berlin.de
ISSN 1860-5664

SFB 649, Humboldt-Universität zu Berlin
Spandauer Straße 1, D-10178 Berlin

The Politics of Related Lending*

Michael Halling† Pegaret Pichler‡ Alex Stomper§

November 20, 2014

Keywords: politics and finance, bank regulation, related lending

JEL Classification: G21, G38, L32.

---

*We would like to thank Philipp Schnabl, Martin Wagner, Josef Zechner, Rainer Jankowitsch, Martin Brown (discussant) and Patrick Behr (discussant). We also thank participants of the European Winter Finance Conference (2009), the EFA Meetings (2010) and of research seminars at HEC Paris, MIT's Sloan School of Management, Northeastern University, the University of Belgrade, the University of Munich and the University of Vienna for helpful discussions and suggestions. The authors are grateful to an anonymous referee and Paul Malatesta, the editor, for helpful suggestions that greatly improved the paper. This research was supported by the Deutsche Forschungsgemeinschaft through the SFB 649 Economic Risk

†Stockholm School of Economics and University of Utah (email: michael.halling@hhs.se)

‡Northeastern University (email: p.pichler@neu.edu)

§Humboldt University, Berlin, and ECGI (email: alex.stomper@hu-berlin.de)

The Politics of Related Lending

Abstract

We analyze the profitability of government-owned banks' lending to their owners, using a unique data set of relatively homogeneous government-owned banks; the banks are all owned by similarly structured local governments in a single country. Making use of a natural experiment that altered the regulatory and competitive environment, we find evidence that such lending was used to transfer revenues from the banks to the governments. Some of the evidence is particularly pronounced in localities where the incumbent politicians face significant competition for reelection.

I. Introduction

Banks play an important role in financing governments. While banks' holdings of government bonds have attracted much attention in the ongoing sovereign debt crisis, banks' direct loans to governments also account for a substantial portion of government financing in many countries. For example, Eminescu (2011) in a study of European countries found that bank loans accounted for as much as 67% of public debt in the year 2009.[1] Stylized facts suggest that bank loans are a particularly common financing choice for local and regional governments outside the U.S, perhaps because of prohibitively high costs of bond issues.[2]

When providing financing to governments, banks are often dealing with borrowers that are endowed with coercive power. Such power derives from the many ways in which governments interact with banks: as regulators, tax authorities, and sometimes as owners. Our focus in this paper is on the latter relationship. Government ownership of banks is quite common in many countries around the world. LaPorta, Lopez-de-Silanes and Shleifer (2002) analyze a sample of 92 countries and find that, on average, government-owned banks control about 42% of the assets of a country's 10 largest banks. These findings were based on data about the year 1995, but more recent contributions confirm that government ownership of banks remains high.[3] When governments act in a dual ca-

[1]Estonia and Luxembourg had the highest fraction of public debt financed with bank loans (67% and 60%), consistent with the idea that these countries find it costly to issue bonds. However, even Germany, which has well developed capital markets, had 20% of public debt financed with bank loans.

[2]The United States is unusual in the preferential tax treatment given to municipal bonds. In addition, Standard and Poor's (S&P) reports that, in the year 2010, it rated only 294 local and regional governments (LRGs) outside the U.S. (See S&P's "International Local And Regional Governments Default And Transition Study, 2010 Update" available on S&P's website.) This indicates that few non-U.S. LRGs have access to bond markets.

[3]See Micco, Panizza and Yanez (2007) and Iannotta, Nocera and Sironi (2007).

pacity as owners and borrowers of banks, politicians may be tempted to take advantage of captive banks in order to obtain government financing at favorable terms. This possibility is the focus of our analysis.

To examine the lending of government owned banks to their owners we make use of a unique data set of savings banks that are owned by Austrian municipalities. Each of the banks is owned by a different government, but these governments all exhibit a similar institutional structure and are governed by identical federal rules. In addition, the banks are all regulated by the same federal agency. We are thus able to investigate the banks' lending to the municipalities, while controlling for regulatory and institutional differences. These controls enable us to concentrate instead on differences in lending practices, bank profitability, and the political and economic environments of the municipalities.

We first compare the municipally owned banks with other Austrian banks that also made loans to municipalities, but were not controlled by municipalities. We find evidence that municipal lending was significantly less profitable for the municipally owned banks than for the non-municipal banks. We next examine differences across the municipalities that own banks and find that the profitability of lending to the municipalities is correlated with the level of political competition and the level of wealth (GDP per capita) in the region. We find evidence that politicians with less secure reelection prospects are more prone to take advantage of their captive banks, and that this effect is more pronounced in areas with high GDP per capita.

In order to measure the profitability of the banks' municipal loans we regress a number of different bank performance measures on the quantity of municipal lending that is done by the bank. To control for cross-sectional variation in loan funding costs, we analyze the change in the regression coefficient around a natural experiment that occurred when Austria joined the European Union (EU) in 1995. At this time Austria became immediately subject to EU regulations. These regulations imposed new transparency requirements on public procurement, as well as strict rules against market distortions

and entry barriers in municipal loan markets. Stylized facts suggest that these regulatory changes, together with EU supervision, made it harder for municipal politicians to coerce captive banks into providing municipal financing at below-market terms.[4] An extreme case in point is the case of the Austrian Hypo Alpe Adria bank, that was publicly criticized by the EU for lending to some Austrian municipalities at below-market terms.[5]

We employ a difference-in-difference analysis: we first examine the difference in bank profitability related to municipal lending before and after Austria's EU accession, and then examine the difference in this difference between municipal banks and non-municipal banks. All of the banks suffered a decrease in interest revenues and net interest revenues (net of interest expense) relative to loans, following Austria's EU accession. This decrease is likely due to increased competition from banks outside of Austria. There, however, emerges a difference between the two groups of banks when we analyze how municipal lending contributed to profitability. For the non-municipal banks municipal loans were more profitable prior to the EU accession (pre-EU) in terms of several performance measures (return on assets, interest revenue and net interest revenue). This result makes sense in light of both the increased competition and the new regulations surrounding municipal lending. By contrast, municipal loans were *less* profitable prior to the EU accession for the municipally owned banks. This result suggests that, prior to the onset of stricter regulation and increased transparency (pre-EU) the municipalities took advantage of their

[4]As part of the new rules, banks that submit losing bids to provide municipal financing can now request information about the terms of the winning bid. Competing banks can thus help to enforce the rules against market distortions. As argued by Levine (2004) such enforcement by competitors can be even more effective than enforcement by regulators.

[5]The municipalities are located in the Austrian state of Carinthia, and this state was until recently the owner of Hypo. The European Commission's criticism of Hypos' lending practices with respect to the municipalities was the subject of a news story presented on Austrian national television on September 17, 2010. A (German) summary of the news story is available on the website for the Carinthian channel of Austria's national TV station, under http://kaernten.orf.at/stories/470364/.

captive banks to engage in unprofitable government financing.

We further hypothesize that the incidence of unprofitable municipal lending has a political component. The municipal banks typically do not have access to capital markets, so being forced to make loans at terms that do not cover the loans' opportunity costs, can crowd out private borrowers. From the perspective of government politicians, such crowding-out is a concern because it can impair a government's tax base. We hypothesize that the extent to which politicians internalize this cost depends on their reelection prospects, because any impairment of a government's tax base will emerge only over time. We thus expect that politicians with lower reelection prospects will exercise less restraint in forcing government-owned banks to engage in unprofitable government financing.

We again use a difference-in-difference approach to test our political hypothesis. Using data from elections prior to the EU accession we subdivide our sample of municipal banks into two sets: banks that are located in regions that have experienced a high degree of political competition and those that have experienced low political competition. We then examine the difference between banks in politically competitive and noncompetitive regions in the change in the banks' profitability around Austria's EU accession. We find evidence consistent with municipalities using related lending to transfer profits out of their banks for both sets of municipally owned banks. However, the evidence is significantly stronger for those banks owned by municipalities where elected officials face greater reelection uncertainty. Consistent with our hypothesis, this result suggests that politicians with poor reelection prospects were more willing to force their banks to engage in unprofitable government financing. The above-mentioned case of Hypo Alpe Adria and its unprofitable lending to municipalities is a case in point since this bank was controlled by a government run by a party that never had an absolute majority and was relatively insecure in its reelection prospects.

We also investigate the possibility that our measures of political competition proxy for some other effects of Austria's EU accession on the banks. In the remainder of the analysis

we test the credibility of alternative explanations for our political results. The most prominent alternative explanation is related to the increased competition that Austrian banks faced after Austria joined the EU. An increase in banking competition can have two effects that are relevant for our analysis. First, it may reduce the opportunity costs that the municipal banks incurred in lending to the municipalities, causing municipal lending to become relatively more profitable. However, lending to municipalities also became more competitive and our evidence indicates that even though municipal lending became relatively more profitable for the municipal banks, it became less profitable for non-municipal banks.

The second effect is that greater banking competition in the post-EU period may have led to better enforcement of the EU rules. Such an effect could drive our results if, for example, our measures of political competition are merely picking up cross-sectional differences in the competition for municipal lending. We indeed find that political competition is positively correlated both with per capita GDP and the number of bank branches in a municipality, both of which may proxy for competition in municipal lending.[6] We thus check if our results concerning political competition could be due simply to the positive correlation between political competition and per capita GDP or the number of bank branches. We find that while both of these variables, especially per capita GDP, have some explanatory power for our results, they do not fully explain the relation between political competition and the profitability of municipal lending.

Our analysis is related to the literature on "related lending", i.e., bank lending to "related" borrowers (owners and managers). Within this literature, our results are most similar to those of LaPorta, Lopez-de-Silanes and Zamarripa (2003), Laeven (2001), and Bae, Kang and Kim (2002), in that we provide evidence consistent with a looting view of

[6]Municipalities may borrow from banks that do not have branches in the town. We expect outside banks to pay more attention to municipalities with higher GDP. For this reason we take into account GDP as well as the number of banks in a town.

related lending. Lamoreaux (1994) and Maurer and Haber (2007), in contrast, argue that banks can benefit from related lending, because such lending can mitigate informational asymmetries between banks and their borrowers.[7] Our work differs from this literature in that we focus on politics and bank management. It is also unlikely that the banks in our sample realized informational benefits in lending to their municipal owners, because during the time of our study these municipalities were uniformly perceived to be relatively free of default risk.[8]

Our work is also related to the literature on government ownership of banks. Within this literature, ours is not the first study to show that politics can affect the lending decisions of government-owned banks. Dinç (2005) finds that government-owned banks increase their lending in election years relative to private banks. Sapienza (2004) finds that Italian government-owned banks charge interest rates that vary across regions and decrease in the regional power of the party in control of the bank. Khwaja and Mian (2005) show that politically connected firms in Pakistan receive more and riskier loans from government-owned banks. Cole (2009) shows that the quantity of agricultural lending by government-owned banks tracks the electoral cycle in India. Interestingly, he finds that the largest increases in lending volume can be found in areas in which elections are particularly close. Our focus on the effect of political competition is also similar to that of Dinç and Gupta (2011) who find that politicians who face more political competition are less apt to privatize government-owned firms. While prior papers document political influence on lending practices, volume and rates, our study is the first to quantify the negative impact of this political control on overall bank performance. We are also the first to focus on government financing by government owned banks, rather than lending

[7]Maurer and Haber (2007) also analyze data about Mexican banks, but from a much earlier period than in the LaPorta, et al (2003) study.

[8]We, in fact, know of no Austrian municipal defaults between the end of World War II and the end of our sample period.

to households and private firms.[9] Our work differs further from earlier work in that we provide evidence that politically motivated influence on banks is a problem that is not limited to emerging economies or countries with high corruption levels.

The paper is organized as follows. In the next section, we discuss the motivation behind our analysis and we describe the natural experiment that is at the core of our empirical analysis. In Section 3 we describe the data and provide some summary statistics. In Section 4 we present the empirical analysis. Section 5 provides concluding remarks.

II. Motivation and Research Strategy

A. Motivation

When governments borrow from banks that they own, the bank owners and the borrowers are the same – the citizens. The citizens are not, however, the decision makers who are directly in charge of the loan decisions. The citizens choose politicians to act as their agents. The politicians typically make the borrowing decisions for the government, and also have significant influence over the captive banks. Within our sample of municipally owned banks, each bank's board of directors typically includes the town's mayor.

A politician is elected to act in the interests of the citizens, but the citizens cannot observe everything that the politician does. A potentially significant source of agency conflicts arises from a politician's desire to be reelected. Suppose that a politician obtains personal benefits from reelection. The politician may take actions that appear to benefit the citizens in the short run, but that are not beneficial in the long run. If the citizens

[9]We, in fact, demonstrate that loans to nongovernmental parties do not (on average) exhibit the politically related effects that we find in loans to governments. Our paper is also related to a growing literature on effects of political agency problems on government financing. For example, Perignon and Vallee (2013) is a recent contribution analyzing local governments' use of structured financing. Our contribution differs due to our focus on governments' dual role as borrowers and owners of banks.

have full information and are rational, such actions should not benefit the politician. The citizens may not, however, have full information. They may lack information about the quality of the politician, as in Drazen and Eslava (2010). In our case the citizens also lack information about the details of the municipally owned banks' business practices. They are thus unable to determine whether a good government budget outcome is the result of the politician's skill, or hidden wealth transfers from the bank to the government. Such wealth transfers may be socially suboptimal because the bank may be capital constrained and its loans to the government may "crowd out" loans to the private sector.[10] The voters may eventually notice the costs of such crowding out, but these costs are hard to assess and typically realized in the future, while the benefits of hidden wealth transfers are realized immediately. If the politician has a low probability of reelection, he does not fully internalize the costs of such wealth transfers. He focuses only on the immediate benefit of improved reelection prospects. In contrast, a politician who is secure in his reelection prospects perceives a smaller benefit from such wealth transfers (smaller increase in reelection prospects) and is more apt to internalize the costs.

This moral hazard model leads us to two predictions. First, banks that are municipally owned are less likely to profit from their lending to municipalities, as compared to banks that are not government owned. That is, they are more likely to be "looted" by their municipal owners. Second, banks that are owned by municipalities in which there is a high degree of competition between political parties are more likely to be "looted" by their municipal owners. These predictions are consistent with the case of the Austrian Hypo Alpe Adria bank cited in the Introduction, which was criticized for lending to Austrian municipalities at below-market terms. This bank was controlled by a government run by a party that never had an absolute majority and had to compete hard to be re-elected.[11]

[10]The banks in our sample are likely to face capital constraints because they are unlisted and cannot tap public equity markets.

[11]Hypo Alpe Adria is not included in the data set that we use in our empirical analysis because it is

B. The Natural Experiment

Our analysis examines the profitability of banks' lending to municipal governments that own them. Profitability depends not only on loan terms but also on loan funding costs, including opportunity costs. Since opportunity costs are, almost by definition, unobservable, we use a natural experiment in order to investigate whether municipally owned banks were lending to municipal governments at below-cost terms. A key requirement of a natural experiment is an event, the occurrence of which was independent of the variables of interest, and that caused exogenous changes in the variables of interest.[12] In our case, the variable of interest is the extent to which municipal politicians could use loans from municipally owned banks to transfer wealth from the banks to the municipalities, i.e., to loot the banks.

Our analysis is based on a natural experiment that occurred when Austria joined the European Union (EU) on January 1, 1995. As of this date Austrian municipalities were required to start obeying EU Directive 92/50EEC concerning public procurement. This directive specifies explicit rules for the public procurement of a range of services, including banking and investment services. The municipalities had to start following "open procedures [...] whereby all interested service providers may submit a tender" (Article I(d)), invite sufficiently many bidders to "ensure genuine competition" (Article 13), and base the award of contracts on "the lowest price only" (Article 36). The directives also increased the transparency of municipal borrowing. Upon request, the municipalities have to report to competing bidders and the European Commission "the name of the successful tenderer and the reason why this tenderer was selected" (Article 12). These rules apply whenever the municipalities borrow more than about 1.5 million Euros. Prior

a universal bank and so is not supervised by the supervisory agency from which we got our data. This agency only supervises savings banks.

[12] As discussed in Meyer (1995), the relevant exogenous event in economic studies is often a change in regulations.

to joining the EU, Austrian municipalities were not required to follow such transparent procedures.

The EU rules effectively stipulated an increase in transparency and competition in the market for government financing in Austria. These rule changes that occurred in 1995 had two potential and conflicting effects on Austrian municipalities and municipally owned banks. First, we would expect the ensuing increase in competition to cause all lending to municipalities to *decrease* in profitability. Second, the increase in transparency should make it more difficult for government owned banks and their municipal owners to engage in any noncompetitive practices with regard to government financing. If, prior to Austria's EU accession, municipal bank owners were using their captive banks to obtain financing at below market terms, then this increase in transparency could cause an *increase* in the profitability of the banks' lending to their municipal owners.

The overall effect that EU membership had on the profitability of related lending thus depends on the way in which related lending was being done prior to Austria's EU accession. If a lack of competition had led the banks to earn excess profits from this type of lending, then we should observe a "post-EU" decrease in the profitability of the related lending. If, instead, the municipalities were using their captive banks to obtain government financing at unprofitable terms, then we may observe a post-EU increase in the profitability of the related lending. Furthermore, if the latter effect holds, then based on the theories outlined in the motivation section, we expect to see a more pronounced increase in the profitability of related lending for banks that are owned by more politically competitive municipalities.

Our research strategy thus follows a "diff-in-diff" approach. We analyze the difference between the profitability of related lending prior to EU accession (pre-EU) and following EU accession (post-EU).[13] We then analyze the difference in this difference between banks

[13]Both the event (joining the EU) and the rule change are exogenous to the variables of interest. Austria's decision to join the EU was based on a popular vote that was taken in June 1994. It is hard to

that are owned by municipalities and non-government owned banks. If municipalities were not using related lending to loot their banks prior to joining the EU, then the EU-mandated competition and transparency should have caused municipal lending to decrease in profitability for all banks. If instead, the municipalities *were* using related lending to loot their banks, then the EU mandates should have caused related lending to become relatively more profitable for the municipally owned banks, and we should be able to reject the following null hypothesis:

H_1: The profitability of lending to municipalities decreased equally for *all* banks following the EU accession.

We also analyze the difference in pre- and post-EU differences in the profitability of municipal lending between banks that are owned by municipalities with a high level of political competition and those owned by municipalities with a low level of political competition. The latter analysis aims at identifying effects of political competition on the profitability of municipally owned banks' related lending.[14] If politicians in more politically competitive municipalities were more apt to loot their banks, then we should be able to reject the following null hypothesis:

H_2: Any changes in the profitability of municipal lending around the time of Austria's EU accession are unrelated to the level of political competition in the municipalities that own the banks in our sample.

---

imagine that the rule change affecting the municipal banks was a determining factor in the vote. It was also not at all clear ex-ante whether the vote would be in favor of joining, so the municipalities could not anticipate the rule changes.

[14]The underlying assumption is that the level of political competition is uncorrelated with the lending's opportunity costs.

III. Data and Descriptive Statistics

A. Financial data about the banks

Our empirical analysis is based on bank-level data about a sample of Austrian, municipally owned savings banks spanning the decade 1990-1999 (i.e., symmetric around the event date of the natural experiment in January 1995). This sample is well-suited to our investigation in that the banks and their owners are homogeneous in terms of many characteristics, including the institutional structure of the municipal governments, the regulation of the banks, and the banks' lack of access to capital markets. We have also collected bank-level data for a set of non-government owned banks in Austria for the same time period to provide a comparison with the municipally owned banks.

We obtained data on the municipal banks from the "Sparkassen-Pruefungsverband". This institution is under the direct supervision of the Federal Ministry of Finance, and is charged with the financial supervision of savings banks. We obtained additional data from the Austrian National Bank (OeNB) that was used to validate and cross-check our original data from the Sparkassen-Pruefungsverband. We manually collected bank-level data on the non-municipal banks from annual reports archived at the Austrian national library in Vienna. The data include the banks' annual balance sheets and profit and loss accounts, as well as information about the compositions of the banks' loan portfolios. The latter information enables us to determine the volume of banks' lending to municipalities. Data on the terms of individual loans is not obtainable, but our focus in this study is more general than loan terms. We are interested in the overall profitability of municipal lending, where profitability captures not only the effect of loan terms, but also the opportunity costs of engaging in related lending.[15]

[15]The municipal banks are mostly small banks that do not have easy access to capital markets, so opportunity costs may include significant shadow costs of capital. Since the banks do not have publicly traded equity, we use accounting data to measure profitability.

To be included in our sample of municipal banks a bank must fulfill the following criteria: (i) the bank was active, as an independent bank, for at least 3 years before and after Austria's EU accession, and (ii) the bank was owned by a municipality during the sample period. We were able to collect data for a sample of 53 banks that satisfy these criteria. The set of non-government owned banks includes all non-government owned Austrian banks for which data could be obtained for the period prior to Austria joining the EU.

For each bank we have between 3 and 5 observations pre-EU (1990 to 1994) and between 3 and 5 observations post-EU (1995 to 1999). For each of the banks we calculated the median value for each variable of interest in the pre-EU period and in the post-EU period. Table 1 presents descriptive statistics for these values. RoA denotes the banks' return on assets. Interest revenue is the bank's interest revenues divided by total loans. Net interest revenue is interest revenues minus interest expenses, divided by total loans. Total assets, TA, are reported in Euros in order to make the information more accessible to readers.[16] We divide the banks' loan portfolios into loans to municipalities and all other loans. The ratios of municipal and non-municipal loans to total assets do not sum up to one because the total assets include non-loan assets, such as investments in traded securities.

Place Table 1 here.

The banks in our sample were generally profitable. The mean size of the non-municipal banks is somewhat larger than the municipal banks. The banks are also somewhat larger in the post-EU period. There is no significant difference in the mean profitability of the banks in the two periods, in terms of return on assets. Both the municipal and non-municipal banks experienced significant drops in interest revenue and net interest revenue, relative to

[16]The data is given in Austrian Schillings (ATS). When producing the numbers in Table 1 we used the exchange rate: 1 Euro = 13.76 ATS.

total loans. The fraction of the municipal banks' assets invested in loans to municipalities increased significantly after Austria joined the EU, from 3.6% during the pre-EU period to 17.3% in the post-EU period. Non-municipal banks experienced the opposite pattern: loans to municipalities decreased from 7.7% in the pre-EU period to 4.4% in the post-EU period. These changes are explained largely by factors that are exogenous to our study.[17] When Austria joined the EU, changes in tax laws and in transfers between the federal and local governments also occurred and affected all Austrian municipalities. As a result many municipalities increased their debt levels. At the same time the larger non-municipal banks realized opportunities to make loans outside of Austria and found the more competitive municipal loans to be less attractive.

B. Data about the municipalities

We collected information about the municipalities from Statistik Austria.[18] Only municipal banks can be matched to municipalities, as non-municipal banks operate at a broader than municipal level. This data includes the amount of debt of each municipality, the population of each municipality and the regional Gross Domestic Product per capita.[19] In addition, we have obtained data on the number of bank branches in each municipality from the Austrian Central Bank. Table 1 includes descriptive statistics for these values, for the set of municipal banks. The GDP per capita increased significantly from the pre-

[17] In a previous version of the present paper, we presented regressions of the change in the volume of the municipal banks' lending to municipalities on measures of political competition and found no significant relation.

[18] http://www.statistik.at/web

[19] GDP data is available only on a regional level that is somewhat coarser than the municipal level. While our main data set consists of 53 banks and municipalities, the regional GDP data is available for 24 regions.

EU period to the post-EU period.[20] The municipal debt per capita and the number of bank branches also increased.

For each municipality we construct measures of political competition, using municipal-level data about the outcomes of elections for representatives in the Austrian national assembly.[21] From the Statistik Austria website we obtained the number of votes that voters in each municipality cast in favor of each major party in the national elections that took place in 1990 and 1994. The Austrian political system is a party-based system; voters place votes for parties. The voting data enables us to determine if a municipality has strongly and persistently favored one party over all others. By using data about national elections and data that precedes Austria's EU accession we are able to construct exogenous measures of political competition.

We construct two indicators of political competition. Each bank in our sample is assigned a value of either zero or one for each indicator, where the value one indicates that the bank is owned by a municipality with a persistent politically competitive environment.[22] For the first measure, $Pol1 = NotStable$, a municipality is defined as noncompetitive ($Pol1 = 0$) if the same party won both elections, and by a margin of at least 10%; otherwise $Pol1 = 1$. According to this measure 25 of the municipalities are identified as politically competitive and 28 as noncompetitive. For the second measure,

[20]The GDP per capita in our municipalities is somewhat lower than for Austria on average. For example, the per capita GDP for Austria in 1997 was 23,000 Euros. The reason for this difference is that our data set includes banks in a number of rural regions and it does not include any banks in the largest Austrian cities. Vienna, Graz, Linz and Salzburg are not represented in our sample.

[21]Our methodology is somewhat similar to that of Dinç and Gupta (2011).

[22]We use the term persistent to stress that our analysis does not focus on one election, but rather on the effect of a persistent level of political competition that gives elected officials incentives to abstain from tax increases and keep up government services, throughout their tenures. In a prior version of the paper we calculated political competition variables using data from six elections from 1975 to 1994. The results are similar to those reported here.

$Pol2 = NondominantWinner$, a municipality is defined as noncompetitive ($Pol2 = 0$) if one party obtained, on average across the two elections, at least 45% of the votes; otherwise $Pol2 = 1$. There are more than two parties, so a party may win with less than 50% of the vote. According to our second measure 28 of the municipalities are identified as politically competitive and 25 as noncompetitive.

These political measures are summarized in Table 2. Panel A shows that $Pol1$ and $Pol2$ are highly correlated; only three banks are classified differently by the two measures. Panel B indicates that close to two-thirds of the politically competitive municipalities are located in regions with greater than the median value of GDP per capita; slightly more than two-thirds of the politically non-competitive municipalities are located in regions with less than or equal to the median value of GDP per capita. We address this positive correlation between political competition and GDP per capita, and its possible significance for our results, later in the paper.

Place Table 2 here.

IV. The Empirical Analysis

A. Related Lending and Bank Profitability

As discussed in Section 2.2 our empirical analysis consists of examining "differences-in-differences". We expect that, due to increased competition following Austria's EU accession, all lending in Austria became less profitable. Due to increased regulation of municipalities, lending to municipalities may have dropped even more in profitability. However, EU transparency rules also make it difficult for municipalities to borrow from their own banks at non-market terms. If municipalities that owned banks had been "looting" these banks through related lending pre-EU, we should find that for these banks municipal lending became relatively more profitable in the post-EU period, i.e. that

Hypothesis H_1 does not hold. We, thus, examine the difference in profitability in municipal lending pre- and post-EU, and then examine the difference in this difference between municipally-owned banks and non-municipal banks. Our main dependent variable when examining bank performance is return on assets, RoA. We also examine the effect of municipal lending on interest revenue and net interest revenue. In contrast to the latter variables, RoA includes the full opportunity costs of municipal lending.

Specifically, we run the following regression to test hypothesis H_1:

$$(1)\quad DV_{i,t} = a_1 \times postEU_t \;+\; a_2 \times postEU_t \times MuniLoans_i \;+\; a_3 \times postEU_t \times Govt_i + a_4 \times postEU_t \times Govt_i \times MuniLoans_i \;+\; a_X X_{i,t} \;+\; u_i \;+\; \epsilon_{i,t}\,.$$

We use three different dependent variables (DV): (i) return on assets, RoA, (ii) net interest revenue/total loans, and (iii) interest revenue/total loans. PostEU is equal to one if the observation is after 1995 and zero otherwise. Govt is equal to one if the bank is a government-owned (municipal) bank and zero otherwise. MuniLoans is the bank's municipal loans, divided by total assets in the regression with $DV = RoA$ and divided by the bank's total loans in the regressions with $DV =$ net interest revenue or interest revenue. $X_{i,t}$ is a vector of control variables: non-municipal loans divided by total assets for the RoA regressions, total loans divided by total assets for the other regressions, and log(total assets). u_i are bank-specific fixed effects. Municipalities do not own multiple banks, so this is the same as municipal fixed effects.

When estimating equation (1), rather than working with annual observations, we run the regressions using pre- and post-EU median values of all variables.[23] For most of the variables there are thus two observations for each bank, a pre-EU median and a post-EU

[23]Our estimation method is based on a suggestion of Bertrand, Duflo and Mullainathan (2004) for difference analyses in the presence of serially correlated errors. We use medians, instead of means, in order to obtain estimates that are robust with respect to outliers.

median. An exception to this is MuniLoans, for which we only use the pre-EU median value. We do this because we are concerned about the substantial increase, for reasons that are outside of our study, in the quantity of municipal lending by the treatment banks after Austria joined the EU. By keeping MuniLoans constant at the pre-EU level we are able to determine the difference in profit changes for banks that did different levels of related lending prior to the EU accession. If the pre-EU municipal lending was unprofitable for the municipally owned banks, then those banks that did more of this lending should experience a relatively smaller drop in profitability post-EU. We also perform robustness tests using both the pre- and post-EU values of MuniLoans and find the qualitative results to be unchanged. Because MuniLoans and Govt are constant across time and we run fixed effects regressions, these variables do not appear alone in equation (1).[24]

If the null hypothesis H_1 holds, then the coefficient a_2 is negative and the coefficient a_4 is zero. Our null is that the municipally owned banks were no different than the non-municipal banks in terms of the change in profitability of lending to municipalities following Austria's EU accession. The results of estimating equation (1) are presented in Table 3. Columns (1) to (3) present results without the triple interaction term; columns (4) to (6) present the results of testing the full equation. The coefficient on postEU is positive for *RoA* and negative for net interest and interest revenue, indicating an increase in *RoA* post-EU, but a decrease in interest and net interest, relative to total loans. The decreases make sense, given that competition from banks outside of Austria increased following the EU accession. And, as expected, the decrease in interest revenue is greater than the decrease in net interest revenue. The coefficient on postEU×Govt is negative for *RoA* and interest revenue, indicating that municipal (Govt) banks suffered more when Austria joined the EU.

[24]We also run random effects regressions as robustness checks, including MuniLoans and Govt as separate variables. The results are consistent with those reported in the paper. We do not report these results as our tests of the validity of using random effects failed.

Place Table 3 here.

We next check whether the drop in profitability was worse for banks that had done more municipal lending in the pre-EU period. For most of the specifications the coefficient on postEU×MuniLoans is negative, indicating that this is the case. This result is not surprising because, in lending to municipalities there was not only increased competition, but also new regulations regarding the transparency of the lending process.

It is, however, the case that municipal banks that did more municipal lending in the pre-EU period experienced a significantly *smaller* drop in profitability following the EU accession. In columns (4) to (6) we note that the coefficient on the difference-in-difference variable, postEU×Govt×MuniLoans, is significantly positive in all three regressions. In addition, as is indicated at the bottom of Table 3, the combined coefficients on postEU×MuniLoans and postEU×Govt×MuniLoans are significantly positive.[25] We are thus able to reject our null hypothesis $H1$: municipally owned banks were *significantly* different than the non-municipal banks in terms of the change in profitability of lending to municipalities post-EU. These results are consistent with the idea that municipalities used related lending to transfer profits out of their banks prior to Austria's EU membership, and that such transfers ended, or significantly decreased, after Austria joined the EU. The results are statistically significant for all three of our performance measures, return

[25]All of the regression results presented in tables in this paper are for OLS regressions with bank-specific fixed effects and no clustering of standard errors. We also ran the regressions with clustering of errors at the state level. We did this because the state governments may have some influence on the municipally-owned banks, causing the errors to be correlated for banks in the same state. Doing so increases the significance of our results. The problem, however, is that we have a small number of clusters (Austria has only 9 states) and this can lead to a bias in the standard errors. A simple fix suggested by Cameron and Miller (2013) is to compute Wald statistics based on a T distribution, rather than a standard normal. Using this fix, we obtain significance levels that are lower than with clustered errors and Normality, but higher than with no clustering. In the interest of being conservative, we report in the tables the results with no clustering. We would like to thank the referee for pointing this issue out to us.

on assets, net interest revenues/total loans and interest revenues/total loans. The results are strongest, however, for return on assets. This is as we expected, given that return on assets takes into account opportunity costs of lending to the municipalities.

We next check that the results are robust to controlling for a number of municipal characteristics. To this end we estimate the following regression equation:

$$(2) \quad DV_{i,t} = b_1 \times postEU_t \; + \; b_2 \times postEU_t \times MuniLoans_i \; + \; b_X X_{i,t} \; + \; b_Y Y_{i,t} + u_i \; + \; \epsilon_{i,t}$$

where $Y_{i,t}$ is a vector of municipal control variables: municipal debt per capita, a dummy variable that equals one if the regional GDP per capita is above the median, and the number of bank branches in the municipality. Equation (2) is estimated only for the municipally owned banks, as the other banks are not associated with a single municipality. For the results to be robust to the municipal controls the coefficient on postEU×MuniLoans in equation (2) should be positive and of similar magnitude to the combined coefficients on postEU×MuniLoans and postEU×Govt×MuniLoans in equation (1).

The results of estimating equation (2) are presented in the first three columns of Table 4. We find that the coefficients are positive and of similar magnitude. In the *RoA* regression the coefficient is a bit larger and more statistically significant in Table 4 than in Table 3, indicating that the municipal controls strengthen the result with respect to return on assets. In the net interest revenue and interest revenue regressions the opposite is seen; the coefficients are somewhat smaller and no longer statistically significant in Table 4, indicating that the municipal controls have somewhat weakened the result with respect to interest and net interest revenues. In all cases, however, the results are consistent with the results reported in Table 3.

Place Table 4 here.

As a final check, in the fourth column of Table 4 we report the results of a regression that is similar to that in column (1), except that we replace postEU×MuniLoans with postEU×Non-municipal loans, in order to check if post-EU profitability is also positively related to lending to other clients.[26] The coefficient on post-EU×Non-municipal loans is negative and statistically significant, suggesting that non-municipal lending became *less* profitable after Austria joined the EU. This interpretation is consistent with the increase in bank competition that occurred in Austria after the country joined the EU.

In comparison, it is quite striking that the coefficient on postEU×MuniLoans in column (1) is significantly positive. If increased competition were the dominant effect of Austria's EU membership, then we should observe reduced profitability for all types of lending activity, resulting in a negative coefficient for postEU×MuniLoans. The significantly positive coefficient on postEU×MuniLoans is consistent with the notion that municipalities were looting their banks prior to EU membership.[27] In the following section we explore this notion further.

B. Politics and Related Lending

We now examine the effect of politics on the differences documented in the previous section. The motivation for the analysis in this section is the hypothesis put forth in Section 2 that politicians with lower probabilities of reelection are more likely to loot their banks. As an alternative to the null hypothesis H_2, the hypothesis states that banks owned by

[26]This check makes sense in that total loans divided by total assets is typically less than one. We do not perform this check for columns (2) and (3) of Table 4 because the muni loans variable in those regressions is municipal loans/total loans, so non-municipal loans/total loans is just 1-MuniLoans.

[27]When we repeat the analysis of Tables 3 and 4 using both pre- and post-EU values of MuniLoans we obtain the same results. However, due to the significant increase in municipal loans post-EU, there is concern that the results could be caused by realized economies of scale. By using only the pre-EU values of municipal loans we avoid this concern.

municipalities with more competitive politics should have realized greater improvements in the profitability of their related lending than banks owned by municipalities with less political competition.

Our main objective in this section is to look for a specific cause that may have induced municipalities to use related lending to transfer profits out of their banks: political competition. In order to be able to assign a causal interpretation to our results we form measures of political competition that we believe are exogenous with respect to related lending and bank profitability. To this end we focus on the persistence of political competition, rather than on any particular election, and we form measures of this persistence using data from elections that took place prior to 1995. In addition, we use data about local voting for representatives to the national assembly, rather than using data about elections for municipal officials. The political competition variables are described in detail in Section 3.2 and summarized in Table 2.

We use these political competition variables to divide the municipal banks into two groups. Those municipalities with noncompetitive political environments (high reelection probability) are assigned a value of $Pol = 0$; those municipalities with competitive political environments (lower reelection probability) are assigned a value of $Pol = 1$. In Table 5 we present summary statistics that enable us to examine similarities and differences between these two subsets of our sample. In this table we segment the data not only between pre- and post-EU observations, but also according to the $Pol1$ variable.[28] Columns (3) and (6) indicate that in terms of pre-EU to post-EU changes our segmented samples are similar to the full sample reported in Table 1. The means of four of our variables exhibit significant change from the pre-EU to the post-EU period: net interest revenue divided by total loans and interest revenue/total loans both decreased, while the fraction of municipal loans on the banks' balance sheets and the GDP per capita increased.

[28]Summary statistics are qualitatively unchanged if we split the sample by $Pol2$.

Place Table 5 here.

In the last three columns of Table 5 we report t-statistics on the differences between the banks owned by politically competitive and noncompetitive municipalities. In column (7) and (8) we report the t-statistics for the differences in the pre-EU and post-EU means, respectively. We observe a number of differences, especially in the pre-EU period (column (7)). Banks located in politically competitive regions are on average larger and have a smaller fraction of municipal loans on their balance sheets. There is, however, no significant difference in the municipal debt per capita between these sets of municipalities and no significant difference in the ratio of municipal loans to municipal debt between the two subsets of banks.[29] It thus appears that the higher fraction of municipal loans on the balance sheets of banks in politically non-competitive areas is due to the fact that these banks are on average smaller. We also note that the municipalities in politically competitive areas have significantly higher GDP per capita and a greater number of bank branches. These banks thus appear to face more competition in their lending. Consistent with this observation the banks in politically competitive areas also have lower net interest revenue relative to their total loans.

In column (9) we report t-statistics for differences in these differences: columns ((2)-(1)) - ((5)-(4)). Our objective is to determine if the differences, for which t-statistics are reported in columns (3) and (6), are significantly different between the two sets of banks. The only significant differences are in GDP per capita and the number of bank branches. Banks that are owned by politically competitive municipalities are located in regions that had higher GDP per capita and more bank branches both pre- and post-EU, and that exhibited greater increases in both of these measures after Austria joined the EU. We explore these relationships in depth in the following section of the paper. It is notable that, apart from these two variables, we find no significant difference-in-difference

[29]This latter test is not tabulated, as this variable is not included in any of our regressions.

between banks owned by politically competitive and noncompetitive municipalities.

Table 6 presents correlations between variables that are summarized in Tables 1 and 2.[30] The three performance measures, return on assets (RoA), net interest revenue/total loans and interest revenue/total loans are all positively correlated, although the correlation between RoA and interest revenue is not significant in the pre-EU period. The performance measures are all negatively correlated with the number of bank branches, as is to be expected. These measures are not significantly correlated with municipal loans/total assets (MuniLoans), with the exception of interest revenue in the post-EU period. Bank size is negatively correlated with MuniLoans and positively correlated with the political competition variable. Consistent with this, MuniLoans is negatively correlated with political competition in the pre-EU period.

Place Table 6 here.

We have seen that banks owned by politically competitive municipalities had a smaller fraction of their assets in loans to the municipalities, but this may be due to the fact that these banks are also larger on average than banks owned by politically noncompetitive municipalities. We now examine whether the loans that politically competitive municipalities obtained from their banks in the pre-EU period were relatively less profitable for the banks. To do so we employ a difference-in-difference specification that is similar to that reported in Table 3, except that we now include only municipally owned banks and we substitute the dummy variable Pol for Govt. We run the following regression:

$$(3)\quad RoA_{i,t} = c_1 \times postEU_t \;+\; c_2 \times postEU_t \times MuniLoans_i \;+\; c_3 \times postEU_t \times Pol_i + c_4 \times postEU_t \times Pol_i \times MuniLoans_i \;+\; c_X X_{i,t} \;+\; c_Y Y_{i,t} \;+\; u_i \;+\; \epsilon_{i,t}\,,$$

[30] We use log(total assets), rather than total assets in this table, as this is the variable that is used in the regressions.

where postEU is a dummy variable that equals one if the observation is in the post-EU period, MuniLoans is municipal loans/total assets, and *Pol* is a dummy variable that equals one if the municipality is politically competitive. $X_{i,t}$ and $Y_{i,t}$ are the same vectors of control variables as in equation (2): non-municipal loans divided by total assets, log(total assets), municipal debt per capita, a dummy variable that equals one if the regional GDP per capita is above the median, and the number of bank branches in the municipality.

The coefficient on postEU×*Pol*×MuniLoans captures the difference-in-difference effect, i.e., the differential effect of EU membership on related lending for banks owned by politically competitive municipalities. If the null hypothesis H_2 of Section 2.2 is correct, then this coefficient should be zero. If instead, the hypothesis put forth in Section 2.1 that politicians facing competition are more likely to loot their banks is correct, then the coefficient on postEU×*Pol*×MuniLoans should be positive. The estimates for equation (3) are presented in Table 7. We only present results with *RoA* as the dependent variable. We find no evidence for a statistically significant relation between net interest or interest revenue and political competition. It thus seems that political competition affects the profitability of the banks' lending to municipalities through the banks' ability to break even on opportunity costs that show up in the banks' *RoA*, but not in interest revenues. The latter observation is consistent with the results in Section 4.1 which also suggest a stronger effect of municipal ownership on the profitability of municipal lending if profitability is measured in terms of *RoA* rather than net interest or interest revenue. The weaker effect of municipal ownership on the latter two measures suggests that the lack of evidence for a significant effect of political competition may simply be a consequence of splitting our sample into subsamples of banks owned by politically competitive and noncompetitive municipalities.

Place Table 7 here.

Table 7 presents estimates of equation (3) with each of the political variables, $Pol1$ and $Pol2$, that are summarized in Table 2. In columns (1) and (2) MuniLoans is set at a constant pre-EU value, as in Tables 3 and 4. The coefficient on postEU×Pol×MuniLoans is positive and significant in columns (1) and (2), indicating that the null hypothesis H_2 does not hold.[31] The coefficient on postEU×MuniLoans continues to be positive, but the magnitude of this coefficient is on the order of half the magnitude reported for the same effect in column (1) of Table 4. That is, we find evidence consistent with municipalities using related lending to transfer profits out of their banks for both sets of municipally owned banks. However, the evidence is stronger for those banks owned by the set of municipalities where elected officials face greater reelection uncertainty. These results are consistent with the predictions developed in Section 2.1.

To gauge the economic importance of these results, consider a government-owned bank that has an average amount of lending to municipalities and is located in a politically competitive municipality. Such a bank would have had, on average municipal loans equal to 2.5% of assets prior to Austria joining the EU. This level of municipal lending resulted in a pre-EU return on assets that was lower by approximately 22 basis points (0.025×0.0875).[32] Multiplied by the average bank size of 556 million Euros, this represents a loss of 1.22 million Euros per bank, per year. Banks in politically noncompetitive areas were on average smaller, so municipal lending was relatively larger for them. For these banks municipal lending in the pre-EU period resulted in a pre-EU return on assets that was lower by approximately 14 basis points (0.048×0.0295).[33] This represents an

[31] If we cluster the errors at the state level, the coefficients on postEU×Pol×MuniLoans in columns (1) and (2) are significant at the 5% and 1% levels, respectively.

[32] The coefficients listed at the bottom of Table 7 for postEU×MuniLoans + postEU×Pol×MuniLoans are 0.090 and 0.085 for $Pol1$ and $Pol2$ respectively. The average of these is 0.0875.

[33] 0.0295 is the average of the coefficients for postEU×MuniLoans in the $Pol1$ and $Pol2$ columns of Table 7.

average loss of only 0.21 million Euros per bank, per year (0.0014×153 mil.Euros). Taking into account that municipal lending increased after Austria joined the EU, the event of Austria joining the EU increased the average bank's profits by significantly more than the 1.22 million and 0.21 Euros calculated here.

Again we check that municipal loans are different from all other loans. To do this we rerun the regression of equation (3), but replace postEU×MuniLoans and postEU×Pol×MuniLoans with postEU×Non-muni loans and postEU×Pol×Non-muni loans. The results of this regression are not reported in the paper, but the coefficient on the triple interaction term is insignificant and the coefficient on postEU×Non-muni loans + postEU×Pol×Non-muni loans is negative and significant. Thus, loans to municipalities are different from loans to other entities. It is only the municipal loans that exhibit signs of looting in the pre-EU period. In columns (3) and (4) of Table 7 we present results that use both the pre- and post-EU values of MuniLoans as a robustness check. The coefficients on postEU×Pol×MuniLoans in these columns are consistent with those in columns (1) and (2), but are not statistically significant by common standards.[34]

Table 7 also shows that banks in politically competitive municipalities underperformed on average by 30 or 40 basis points, after Austria joined the EU (see the coefficients of post-EU×Pol in columns (1) and (2)). In order to examine the effect of politics alone, we estimate a specification similar to equation (3), but without any of the terms containing MuniLoans. We find (also untabulated in the paper) that the political variables by themselves (not interacted with MuniLoans) have weaker explanatory power for bank profitability. That is, political competition seems to affect the profitability of these government-owned banks through their lending to municipalities.

Finally, we consider an alternative interpretation of the results of this section: perhaps

[34]The p-values are 0.167 and 0.154 in columns (3) and (4), respectively. If we cluster the errors at the state level, the coefficients on postEU×Pol×MuniLoans in columns (3) and (4) are significant at the 10% and 5% levels, respectively.

all municipal banks were looted prior to Austria's EU accession, but the EU rules were more effectively enforced in locations with greater political competition. In columns (3) and (4) of Table 7 the coefficients on MuniLoans and $Pol\times$ MuniLoans are all negative, indicating that lending to municipalities was unprofitable in the pre-EU period. The coefficients on $Pol\times$ MuniLoans are not, however, statistically significant, so we cannot rule out the possibility of better enforcement post-EU. We explore this idea further in the following section.

C. GDP, Bank Competition and Political Competition

Our above analysis documents that Austria's EU accession was associated with changes in the profitability of municipally owned banks' lending to their owners, and that those changes were associated with political competition. In this section we explore the latter association further. As discussed in Section 2, Austria's EU accession resulted in both an increase in the transparency of the banks' lending to their owners, and a removal of entry barriers in banking markets. These two effects are related in that the increase in transparency was meant to ensure public procurement at competitive market prices, and such prices can only be observed in the presence of competition.

We next explore an alternative interpretation of our results, based on the idea that our measures of political competition may pick up effects of an increase in the competitiveness of banking markets. An increase in banking competition can have two effects that are relevant for our analysis. First, it may reduce the opportunity costs that banks incur in lending to the municipalities, causing municipal lending to become relatively more profitable. However, as our results in Section 4.1 indicate, it appears that lending to municipalities also became more competitive and less profitable, at least for non-municipally controlled banks. The second effect is that greater banking competition in the post-EU period may have led to better enforcement of the EU rules. As suggested by Levine (2004)

enforcement by competitors can be more effective than enforcement by regulators.

We have already noted that the politically competitive municipalities have on average higher GDP per capita and a greater number of bank branches. These are both variables that we expect to be positively correlated with competition for municipal lending.[35] We begin the analysis of this section by attempting to reproduce our main results using High GDPC instead of our *Pol* variables. High GDPC equals one if the municipality's GDP per capita is greater than the median GDP in our sample. We reestimate equation (3), replacing all occurrences of the political competition indicator variable with High GDPC.

The results, presented in the first column of Table 8, are quite similar to our main results presented in Table 7. Most importantly, the coefficient for the interaction term post-EU×High GDPC×MuniLoans is positive and significant.[36] We then repeat the same exercise using the number of bank branches instead of High GDPC. The results of the latter estimation (not tabulated in this paper) are similar, but much weaker. That is, we are able to replicate the results of Table 7 using GDP per capita instead of political competition as one of our main variables of interest, but we are unable to replicate the results using the number of bank branches. These results are not surprising given that both GDP per capita and the number of bank branches are positively correlated with our political variables, but GDP is more highly correlated. For the remainder of this section we focus on GDP per capita.

[35]Municipalities may borrow from banks that do not have branches in the town. We expect outside banks to pay more attention to municipalities with higher GDP. It is for this reason that we consider both GDP and the number of bank branches as possible proxies for competition in municipal lending. Moreover, while these two variables are positively correlated, the correlation in our sample is not as high as that reported in other studies such as Claessens and Laeven (2004) who report a correlation coefficient of 0.69 between the number of banks and GDP per capita.

[36]If we cluster the errors at the state level, this coefficient is significant at the 1% level, with a t-statistic that is similar to that of postEU×*Pol*×MuniLoans in column (2) of Table 7.

Place Table 8 here.

To determine which variable, political competition or GDP per capita, captures the more important relation for our analysis we next examine segmented samples of our data. In the second and third columns of Table 8 we repeat the analysis of the first column, but with our data set split according to the political competition variable $Pol1$. The coefficient for the interacted term post-EU×High GDPC×MuniLoans is insignificant. Once we control for political competition, GDP per capita has much less explanatory power for our main results concerning the post-EU change in the profitability of municipal lending. To determine if the results found in the first column of Table 8 occur only because of the correlation between GDP per capita and political competition we next present a similar segmented analysis, but in reverse. In the fourth and fifth columns of Table 8 the sample is segmented according to High GDPC. We again focus on the triple interaction term, post-EU×Pol×MuniLoans. In column (4), which presents the results for the subset of banks located in regions with above-the-median GDP per capita, the coefficient for this interacted term is positive and close to significant. In column (5), low GDP per capita, the coefficient for this interacted term is insignificant.[37]

In summary, we find evidence that is consistent with a political explanation for municipalities transferring profits out of their banks when the banks engage in related lending to the municipalities. It is possible, however, that the increased transparency of related lending around Austria's EU accession more effectively curtailed the looting of banks located in regions with relatively high GDP per capita. Our evidence is consistent with the idea that such regions attracted more competition for lending to municipalities, thus establishing benchmarks for the terms at which the latter banks could lend to their owners.

[37]If we cluster the errors at the state level, the coefficient on post-EU×High GDPC×MuniLoans continues to be insignificant in column (2) and is significant at the 10% level in column (3). The coefficient on the triple interaction term in column (4) is significant at the 1% level. In column (5) it remains insignificant.

This interpretation is consistent with Levine (2004) and articles in the Austrian popular press; for example, the looting example mentioned at the end of section 2.1. In the case of Hypo Group Alpe Adria, this article specifically mentions the mechanism of granting below market rate loans to a municipality. It also confirms that the Commission of the European Union actively enforces EU regulation. And, consistent with our discussion of the role of GDP per capita and competition, the Hypo Group Alpe Adria bank is located in a geographic area with high levels of political competition, but relatively low economic wealth. This might explain why the looting behavior was still going on a number of years after Austria joined the EU.

V. Conclusion

This paper extends our current understanding of the situation in which governments act in a dual role as owners of and borrowers from banks. Most importantly, we document a link between "looting" through related lending and the probability that a related borrower's position of control with respect to the bank will endure. Using a unique data set about municipally owned banks we find evidence consistent with the "looting" explanation of related lending: that is, evidence that related lending has been used to transfer profits out of the banks. We show that such evidence is strongest for banks that are owned by municipalities in which there is a competitive political environment. These results are consistent with our hypothesis that incumbent politicians who are more likely to lose reelection are also more likely to use related lending to transfer profits from a government-owned bank to the government coffers. These transfers can be damaging, as they crowd out private borrowers. We also find that the evidence is stronger in areas with higher GDP per capita. This result is consistent with the notion that more competition for lending to the municipalities occurs in these areas, and such competition can enhance the effectiveness of bank regulations.

By documenting evidence of looting through related lending in a developed country with high legal standards, we extend the discussion of related lending beyond the scope of emerging markets with low governance standards. Our results suggest that in markets with a high rule of law mandating transparency for government banking transactions can be valuable. The results also suggest, however, that for this transparency to be effective, it is necessary to have stakeholders with incentives to monitor, such as competing banks.

References

Alesina, A., and G. Tabellini. "A Positive Theory of Fiscal Deficits and Government Debt." *The Review of Economic Studies*, 57 (1990), 403–414.

Bae, K.-H.; J.-K. Kang; and J.-M. Kim. "Tunneling or Value Added: Evidence from Mergers by Korean Business Groups." *The Journal of Finance*, 57 (2002), 2695–2740.

Bertrand, M.; E. Duflo; and S. Mullainathan. "How Much Should We Trust Differences-in-Differences Estimates?" *The Quarterly Journal of Economics*, 119 (2004), 249–275.

Cameron, A. C., and D. L. Miller. "A Practitioner's Guide to Cluster-Robust Inference." UC Davis working paper, (2013).

Claessens, S., and L. Laeven. "What Drives Bank Competition? Some International Evidence." *Journal of Money, Credit, and Banking*, 36 (2004), 563–583.

Cole, S. "Fixing Market Failures or Fixing Elections? Agricultural Credit in India." *American Economic Journal: Applied Economics*, 1 (2009), 219–250.

Dinç, I. S. "Politicians and Banks: Political Influences on Government-owned Banks in Emerging Markets." *Journal of Financial Economics*, 77 (2005), 453–479.

Dinç, I. S., and N. Gupta. "The Decision to Privatize: Finance and Politics." *Journal of Finance*, 66 (2011), 241–270.

Drazen, A., and M. Eslava. "Electoral Manipulation via Voter-friendly Spending: Theory and Evidence." *Journal of Development Economics*, 92 (2010), 39–52.

Eminescu, S. "Economy and Finance: Structure of Government Debt in Europe." *eurostat Statistics in Focus*, 68 (2011).

Iannotta, G.; G. Nocera; and A. Sironi. "Ownership Structure, Risk, and Performance in the European Banking Industry." *Journal of Banking and Finance*, 31 (2007), 2127–2149.

Khwaja, A. I., and A. Mian. "Do Lenders Favor Politically Connected Firms? Rent Provision in an Emerging Financial Market." *The Quarterly Journal of Economics*, 120

(2005), 137–1411.

La Porta, R.; F. Lopez-de-Silanes; and A. Shleifer. "Government Ownership of Banks." *The Journal of Finance*, 57 (2002), 265–301.

La Porta, R.; F. Lopez-de-Silanes; and G. Zamarripa. "Related Lending." *Quarterly Journal of Economics*, 118 (2003), 231–267.

Laeven, L. "Insider Lending and Bank Ownership: The Case of Russia." *Journal of Comparative Economics*, 29 (2001), 207–229.

Lamoreaux, N. R. *Insider Lending: Banks, Personal Connections, and Economic Development in Industrial New England*. New York, NY: Cambridge University Press (1994).

Levine, R. "The Corporate Governance of Banks: A Concise Discussion of Concepts and Evidence." World Bank Policy Research Working Paper, (2004).

Maurer, N., and S. Haber. "Related Lending and Economic Performance: Evidence from Mexico." *The Journal of Economic History*, 67 (2007), 551–581.

Meyer, B. D. "Natural and Quasi-experiments in Economics." *Journal of Business and Economic Statistics*, 13 (1995), 151–161.

Micco, A.; U. Panizza; and M. Yanez. "Bank Ownership and Performance. Does Politics Matter?" *Journal of Banking and Finance*, 31 (2007), 219–241.

Perignon, C., and B. Vallee. "Political Incentives and Financial Innovation: The Strategic Use of Toxic Loans by Local Governments." HEC Paris Research Paper, (2013).

Sapienza, P. "The Effects of Government Ownership on Bank Lending." *Journal of Financial Economics*, 72 (2004), 357–384.

Table 1: **Summary statistics of financial variables.** For each of the 53 municipal and 22 non-municipal banks a median value was calculated for each variable of interest for the years from 1990 to 1994 (pre-EU) and a second median was calculated for the years from 1995 to 1999 (post-EU). This table reports summary statistics for these median values. Stars next to the means in the Post-EU panels indicate differences between pre-EU and post-EU means that are significant at the 1% (***), 5% (**) or 10% (*) level.

Municipal Banks Before EU Accession (Pre-EU)

Variable	Mean	Std. Dev.	Median	N
Return on assets, *RoA*	0.0083	0.0029	0.0081	53
Net interest revenue/total loans	0.0454	0.0064	0.0457	53
Interest revenue/total loans	0.1080	0.0066	0.1077	53
Total assets (Mil.Euros), TA	343	665	164	53
Municipal loans/total assets	0.036	0.029	0.033	53
Non Municipal loans/total assets	0.728	0.067	0.726	53
Muni. debt per capita (Thou. Euros)	1.104	0.913	0.898	53
GDP per capita (Thou. Euros)	15.159	3.913	14.000	53
Number of bank branches	8.74	10.73	5	53

Municipal Banks After EU Accession (Post-EU)

Variable	Mean	Std. Dev.	Median	N
Return on assets, *RoA*	0.0076	0.0041	0.0070	53
Net interest revenue/total loans	0.0391***	0.0073	0.0393	53
Interest revenue/total loans	0.0790***	0.0094	0.0801	53
Total assets (Mil.Euros), TA	456	836	213	53
Municipal loans/total assets	0.173***	0.074	0.181	53
Non Municipal loans/total assets	0.730	0.065	0.737	53
Muni. debt per capita (Thou. Euros)	1.390	1.038	1.184	53
GDP per capita (Thou. Euros)	18.68***	4.858	16.800	53
Number of bank branches	9.01	10.86	5	53

Non-municipal Banks Before EU Accession (Pre-EU)

Variable	Mean	Std. Dev.	Median	N
Return on assets, *RoA*	0.0036	0.0018	0.0031	22
Net interest revenue/total loans	0.0190	0.0098	0.0166	22
Interest revenue/total loans	0.0749	0.0292	0.0727	22
Total assets (Mil.Euros), TA	555	896	237	22
Municipal loans/total assets	0.077	0.067	0.045	22
Non Municipal loans/total assets	0.811	0.058	0.817	22

Non-municipal Banks After EU Accession (Post-EU)

Variable	Mean	Std. Dev.	Median	N
Return on assets, *RoA*	0.0044	0.0020	0.0042	22
Net interest revenue/total loans	0.0139**	0.0064	0.0125	22
Interest revenue/total loans	0.0548***	0.0166	0.0534	22
Total assets (Mil.Euros), TA	805	994	416	22
Municipal loans/total assets	0.044**	0.023	0.045	22
Non Municipal loans/total assets	0.781*	0.051	0.782	22

Table 2: **Summary statistics of political variables.** The political variables were created using data from two elections for local representatives to the national government. The two elections took place before 1995 (1990 and 1994). Not Stable ($Pol1$) is equal to zero if the same party won both elections by a margin of at least 10%; otherwise $Pol1$ is equal to one. Non-Dominant winner ($Pol2$) is equal to zero if one party obtained, on average across the two elections, at least 45% of the votes; otherwise $Pol2$ is equal to one. A value of one (zero) for any political variable indicates a high (low) level of political competition. High GDPC equals one if the GDP per capita is greater than the median value for our sample of banks, in each period (pre- and post-EU). Panel B uses the pre-EU values for High GDPC.

Panel A: Political Variables

		Non-dominant winner, $Pol2$		
		# equal to 1	**# equal to 0**	$Pol1$ total
Not Stable,	**# equal to 1**	25	0	25
$Pol1$	**# equal to 0**	3	25	28
	$Pol2$ total	28	25	53

Panel B: Politics and GDP

	High GDPC=0	High GDPC=1
$Pol1$=1	9	16
$Pol1$=0	19	9
$Pol2$=1	10	18
$Pol2$=0	18	7

Table 3: **Bank Ownership, Municipal Lending and Performance: Private and Government-owned Banks.** OLS regressions with bank-specific fixed effects. The dependent variable is either return on assets, RoA, net interest revenue/total loans, or interest revenue/total loans. PostEU is equal to one if the observation is after 1995 and zero otherwise. MuniLoans in columns (1) and (4) is the ratio of municipal loans to total assets in the pre-EU period; in the remaining columns MuniLoans is the ratio of the bank's municipal loans to total loans, pre-EU. Govt is equal to one if the bank is a government-owned (municipal) bank and zero otherwise. TA is total assets. For each bank there is one observation pre-EU (postEU=0) and one post-EU (postEU=1). MuniLoans and Govt are constant across these two observations. t-statistics are given in parentheses.

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent Variable:	RoA	$NetIntRev$	$IntRev$	RoA	$NetIntRev$	$IntRev$
postEU	0.002	-0.004**	-0.019***	0.003**	-0.004**	-0.018***
	(1.62)	(-2.03)	(-3.43)	(2.08)	(-2.68)	(-3.61)
postEU × MuniLoans	0.000	-0.014**	-0.064***	-0.013	-0.021*	-0.085
	(0.05)	(-2.35)	(-3.91)	(-1.47)	(-1.83)	(-1.70)
postEU × Govt	-0.002*	0.000	-0.006	-0.004***	-0.001	-0.010**
	(-1.83)	(0.14)	(-1.25)	(-3.39)	(-0.47)	(-2.11)
postEU × Govt × MuniLoans				0.053***	0.043**	0.125**
				(2.97)	(2.65)	(2.09)
Non-Municipal loans/TA	-0.013**			-0.022***		
	(-2.32)			(-3.64)		
Total loans/TA		-0.013**	-0.030*		-0.020**	-0.050*
		(-2.04)	(-1.71)		(-2.25)	(-1.98)
$Log(TA)$	-0.004*	-0.000	0.011	-0.003	-0.000	0.010
	(-1.85)	(-0.05)	(1.23)	(-1.64)	(-0.12)	(1.28)
R-squared (within)	0.165	0.661	0.833	0.260	0.689	0.848
Observations	150	150	150	150	150	150
Groups (number of banks)	75	75	75	75	75	75
postEU × MuniLoans +				0.040**	0.022**	0.040*
postEU × Govt × MuniLoans				(2.60)	(2.14)	(1.81)

* p<0.10, ** p<0.05, *** p<0.01

Table 4: **Municipal Lending and Performance: Government-owned Banks only.** OLS regressions with bank-specific fixed effects. The dependent variable is either return on assets, RoA, net interest revenue/total loans, or interest revenue/total loans. PostEU is equal to one if the observation is after 1995 and zero otherwise. MuniLoans in columns (1) and (4) is the ratio of municipal loans to total assets in the pre-EU period; in the remaining columns MuniLoans is the ratio of the bank's municipal loans to total loans, pre-EU. Municipal debt and municipal GDP are for the municipality that owns the bank. High GDPC equals one if the GDP per capita is greater than the median value for our sample of banks, in each period (pre- and post-EU). TA is total assets. For each bank there is one observation pre-EU (postEU=0) and one post-EU (postEU=1). MuniLoans is constant across these two observations. t-statistics are given in parentheses.

	(1)	(2)	(3)	(4)
Dependent Variable:	RoA	$NetIntRev$	$IntRev$	RoA
postEU	-0.001	-0.003	-0.030***	0.015***
	(-0.43)	(-1.42)	(-8.06)	(2.92)
postEU × MuniLoans	0.052***	0.018	0.024	
	(3.08)	(1.14)	(0.91)	
Non-Muni.loans/TA	-0.029***			-0.004
	(-3.76)			(-0.58)
postEU × Non-Muni.loans/TA				-0.020**
				(-2.64)
Total loans/TA		-0.016**	-0.028**	
		(-2.11)	(-2.20)	
Muni.debt per capita	-0.002***	-0.002*	-0.002	-0.002**
	(-2.91)	(-1.78)	(-1.19)	(-2.29)
High GDPC	0.002	-0.002	-0.003	0.003
	(0.76)	(-0.54)	(-0.34)	(1.13)
Number of banks	0.001	0.000	-0.001	0.001
	(0.90)	(0.16)	(-0.64)	(1.07)
$Log(TA)$	-0.005	-0.004	0.014	-0.005
	(-1.46)	(-0.75)	(1.55)	(-1.37)
R-squared (within)	0.449	0.729	0.949	0.422
Observations	106	106	106	106
Groups (number of banks)	53	53	53	53

* p<0.10, ** p<0.05, *** p<0.01

Table 5: **Summary statistics of financial variables.** For each of the 53 municipal banks a median value is calculated for each variable of interest for the years from 1990 to 1994 (pre-EU) and a second median is calculated for the years from 1995 to 1999 (post-EU). This table reports sample means of these median values across banks. The classification into "Pol. Non-Comp. Muni." (politically noncompetitive municipalities) and "Pol. Comp. Muni." (politically competitive municipalities) is based on the *Pol*1 variable, as described in Table 2. There are thus 28 banks in the noncompetitive category and 25 in the competitive category. Columns (3) and (6) report t-statistics of the differences between the post-EU and the pre-EU values: columns (2) - (1) and (5) - (4). Columns (7) and (8) report t-statistics of the differences between columns (1) and (4) and columns (2) and (5). Column (9) reports t-statistics of the differences in differences: ((2)-(1)) - ((5)-(4)).

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Pol. Non-Comp. Muni.			**Pol. Comp. Muni.**			**(1)-(4)**	**(2)-(5)**	
	Pre-EU	Post-EU	tstat	Pre-EU	Post-EU	tstat	tstat	tstat	tstat
RoA	0.0080	0.0078	-0.34	0.0086	0.0073	-1.06	-0.66	0.36	1.01
Net interest revenue	0.0471	0.0402	-4.62***	0.0435	0.0378	-2.56**	2.10**	1.15	-1.04
Interest revenue	0.1083	0.0788	-18.03***	0.1076	0.0792	-9.99***	0.38	-0.16	-0.53
Total assets (mil.Euros)	153	220	1.46	556	720	0.55	-2.29**	-2.25**	-1.63
Muni.loans/TA	0.048	0.169	7.34***	0.025	0.178	10.45***	2.69***	-0.42	-1.56
Muni.debt per capita (thou.Euros)	1.096	1.429	1.41	1.114	1.346	0.76	-0.07	0.29	0.64
GDP per capita (thou.Euros)	14.00	17.20	3.08***	16.46	20.34	3.01***	-2.38**	-2.46**	-1.78*
Number of bank branches	5.57	5.73	0.13	13.32	14.24	0.18	-2.28**	-2.32**	-2.40**

Table 6: **Correlations.** For each of the 53 municipal banks a median value is calculated for each variable of interest for the years from 1990 to 1994 (pre-EU) and a second median is calculated for the years from 1995 to 1999 (post-EU). This table reports cross-correlations. Significance levels are indicated by *'s (* p<0.10, ** p<0.05, *** p<0.01). *RoA* is return on assets. TA is total assets of the bank. MuniLoans is the ratio of the bank's municipal loans to total assets. Muni. debt is the amount of debt per capita for the municipality. GDP is GDP per capita. # banks is the number of bank branches in the municipality. $Pol1$ is defined in Table 2.

Pre-EU (N=53)

	RoA	$NetIntRev$	$IntRev$	$log(TA)$	MuniLoans	Muni. debt	GDP	# banks
$NetIntRev$	0.351***							
$IntRev$	0.057	0.576***						
$log(TA)$	-0.461***	-0.611***	-0.303**					
MuniLoans	0.170	0.094	0.042	-0.245*				
Muni. debt	-0.070	-0.326**	-0.105	0.315**	0.140			
GDP	-0.029	-0.309**	-0.058	0.478***	-0.220	0.226		
# banks	-0.419***	-0.579***	-0.285**	0.824***	-0.140	0.205	0.443***	
$Pol1$	0.092	-0.282**	-0.053	0.288**	-0.353***	0.010	0.317**	0.304**

Post-EU (N=53)

	RoA	$NetIntRev$	$IntRev$	$log(TA)$	MuniLoans	Muni. debt	GDP	# banks
$NetIntRev$	0.456***							
$IntRev$	0.422***	0.823***						
$log(TA)$	-0.297**	-0.546***	-0.453***					
MuniLoans	0.088	0.045	0.252*	-0.251*				
Muni. debt	-0.034	-0.408***	-0.304**	0.193	0.061			
GDP	0.031	-0.195	-0.190	0.529***	-0.227	0.109		
# banks	-0.361***	-0.481***	-0.405***	0.796***	-0.224	0.117	0.506***	
$Pol1$	-0.051	-0.159	0.022	0.292**	0.059	-0.040	0.326**	0.308**

* p<0.10, ** p<0.05, *** p<0.01

Table 7: **Politics and Related Lending: RoA Causal Effects. Government-owned Banks only.** OLS regressions with bank-specific fixed effects. The dependent variable is return on assets, RoA. PostEU is equal to one if the observation is after 1995 and zero otherwise. MuniLoans is the ratio of municipal loans to total assets. In columns (1) and (2) only the pre-EU value of MuniLoans is used; in columns (3) and (4) both pre- and post-EU values of MuniLoans are used. We use two variables to identify politically competitive municipalities: $Pol1$ and $Pol2$ are defined in Table 2. Municipal debt and municipal GDP are for the municipality that owns the bank. High GDPC equals one if the GDP per capita is greater than the median value for our sample of banks, in each period (pre- and post-EU). TA is total assets. For each bank there is one observation pre-EU (postEU=0) and one post-EU (postEU=1). Pol is constant across these two observations; in columns (1) and (2) MuniLoans is also constant across the two observations. t-statistics are given in parentheses.

	(1)	(2)	(3)	(4)
Dependent variable = RoA	pre-EU MuniLoans		pre- and post-EU MuniLoans	
Political Variable:	$Pol1$	$Pol2$	$Pol1$	$Pol2$
MuniLoans			-0.029*	-0.026
			(-1.74)	(-1.53)
Pol × MuniLoans			-0.028	-0.029
			(-0.79)	(-0.83)
postEU	0.001	0.002	0.001	0.002
	(0.88)	(1.03)	(0.60)	(0.87)
postEU × MuniLoans	0.031*	0.028	0.029*	0.026
	(1.88)	(1.65)	(1.71)	(1.45)
postEU × Pol	-0.004***	-0.003**	-0.006***	-0.005**
	(-2.71)	(-2.42)	(-2.77)	(-2.58)
postEU × Pol × MuniLoans	0.059*	0.057*	0.045	0.045
	(1.90)	(1.87)	(1.41)	(1.45)
Non-Muni.loans/TA	-0.034***	-0.033***	-0.031***	-0.030***
	(-4.08)	(-3.90)	(-3.73)	(-3.54)
Muni.debt per capita	-0.002***	-0.002***	-0.002***	-0.002***
	(-2.93)	(-2.85)	(-2.76)	(-2.76)
High GDPC	0.001	0.001	0.001	0.001
	(0.28)	(0.26)	(0.33)	(0.33)
Number of banks	0.000	-0.000	0.000	0.000
	(0.09)	(-0.17)	(0.79)	(0.46)
$Log(TA)$	-0.005	-0.006*	-0.005	-0.006*
	(-1.55)	(-1.74)	(-1.46)	(-1.72)
R-squared (within)	0.508	0.492	0.540	0.522
Observations	106	106	106	106
Groups (number of banks)	53	53	53	53
MuniLoans + Pol × MuniLoans			-0.057	-0.055
			(-1.53)	(-1.53)
postEU × MuniLoans +	0.090***	0.085***	0.074**	0.071**
postEU × Pol × MuniLoans	(2.80)	(2.72)	(2.23)	(2.21)
* p<0.10, ** p<0.05, *** p<0.01				

Table 8: **Politics, GDP per capita and Related Lending: Government-owned Banks only.** OLS regressions with bank-specific fixed effects. The dependent variable is return on assets, RoA. PostEU is equal to one if the observation is after 1995 and zero otherwise. MuniLoans is the ratio of municipal loans to total assets in the pre-EU period. Municipal debt and GDP are for the municipality that owns the bank. High GDPC equals one if the GDP per capita is greater than the median value for our sample of banks, in each period (pre- and post-EU). TA is total assets. For each bank there is one observation pre-EU (postEU=0) and one post-EU (postEU=1). MuniLoans and $Pol1$ are constant across these two observations. In columns (2) and (3) the sample is segmented according to $Pol1$, which is defined in Table 2; in columns (4) and (5) the sample is segmented according to High GDPC. t-statistics are given in parentheses.

	(1)	(2)	(3)	(4)	(5)
dependent variable = RoA	Full Sample	$Pol1$=1	$Pol1$=0	Hi GDPC=1	Hi GDPC=0
postEU	0.000	-0.000	0.000	-0.001	0.004
	(0.25)	(-0.05)	(0.19)	(-0.59)	(1.64)
postEU × MuniLoans	0.027	-0.001	0.024	0.075**	0.000
	(1.48)	(-0.01)	(1.13)	(2.47)	(0.00)
postEU × High GDPC	-0.001	-0.001	-0.000		
	(-1.07)	(-0.51)	(-0.22)		
postEU × High GDPC × MuniLoans	0.054**	0.082	0.029		
	(2.09)	(1.04)	(0.86)		
postEU × $Pol1$				-0.003*	-0.000
				(-2.06)	(-0.16)
postEU × $Pol1$ × MuniLoans				0.064	-0.045
				(1.48)	(-0.69)
Non-municipal loans/TA	-0.027***	-0.024	-0.029**	-0.045***	-0.013
	(-3.34)	(-1.23)	(-2.41)	(-4.01)	(-0.97)
Muni.debt per capita	-0.002***	-0.005	-0.001*	-0.003*	-0.002**
	(-2.90)	(-1.65)	(-1.85)	(-1.81)	(-2.35)
High GDPC	0.001		0.001		
	(0.50)		(0.32)		
Number of banks	-0.000	-0.000	0.000	0.000	0.000
	(-0.82)	(-0.46)	(0.03)	(0.14)	(0.06)
$Log(TA)$	-0.004	-0.003	-0.003	-0.001	-0.010*
	(-1.34)	(-0.40)	(-0.58)	(-0.14)	(-2.03)
R-squared (within)	0.482	0.649	0.480	0.717	0.521
Observations	106	50	56	50	56
Groups (number of banks)	53	25	28	25	28
postEU × MuniLoans +				0.138***	-0.044
postEU × $Pol1$ × MuniLoans				(3.52)	(-0.66)
* p<0.10, ** p<0.05, *** p<0.01					

SFB 649 Discussion Paper Series 2014

For a complete list of Discussion Papers published by the SFB 649, please visit http://sfb649.wiwi.hu-berlin.de.

001 "Principal Component Analysis in an Asymmetric Norm" by Ngoc Mai Tran, Maria Osipenko and Wolfgang Karl Härdle, January 2014.
002 "A Simultaneous Confidence Corridor for Varying Coefficient Regression with Sparse Functional Data" by Lijie Gu, Li Wang, Wolfgang Karl Härdle and Lijian Yang, January 2014.
003 "An Extended Single Index Model with Missing Response at Random" by Qihua Wang, Tao Zhang, Wolfgang Karl Härdle, January 2014.
004 "Structural Vector Autoregressive Analysis in a Data Rich Environment: A Survey" by Helmut Lütkepohl, January 2014.
005 "Functional stable limit theorems for efficient spectral covolatility estimators" by Randolf Altmeyer and Markus Bibinger, January 2014.
006 "A consistent two-factor model for pricing temperature derivatives" by Andreas Groll, Brenda López-Cabrera and Thilo Meyer-Brandis, January 2014.
007 "Confidence Bands for Impulse Responses: Bonferroni versus Wald" by Helmut Lütkepohl, Anna Staszewska-Bystrova and Peter Winker, January 2014.
008 "Simultaneous Confidence Corridors and Variable Selection for Generalized Additive Models" by Shuzhuan Zheng, Rong Liu, Lijian Yang and Wolfgang Karl Härdle, January 2014.
009 "Structural Vector Autoregressions: Checking Identifying Long-run Restrictions via Heteroskedasticity" by Helmut Lütkepohl and Anton Velinov, January 2014.
010 "Efficient Iterative Maximum Likelihood Estimation of High-Parameterized Time Series Models" by Nikolaus Hautsch, Ostap Okhrin and Alexander Ristig, January 2014.
011 "Fiscal Devaluation in a Monetary Union" by Philipp Engler, Giovanni Ganelli, Juha Tervala and Simon Voigts, January 2014.
012 "Nonparametric Estimates for Conditional Quantiles of Time Series" by Jürgen Franke, Peter Mwita and Weining Wang, January 2014.
013 "Product Market Deregulation and Employment Outcomes: Evidence from the German Retail Sector" by Charlotte Senftleben-König, January 2014.
014 "Estimation procedures for exchangeable Marshall copulas with hydrological application" by Fabrizio Durante and Ostap Okhrin, January 2014.
015 "Ladislaus von Bortkiewicz - statistician, economist, and a European intellectual" by Wolfgang Karl Härdle and Annette B. Vogt, February 2014.
016 "An Application of Principal Component Analysis on Multivariate Time-Stationary Spatio-Temporal Data" by Stephan Stahlschmidt, Wolfgang Karl Härdle and Helmut Thome, February 2014.
017 "The composition of government spending and the multiplier at the Zero Lower Bound" by Julien Albertini, Arthur Poirier and Jordan Roulleau-Pasdeloup, February 2014.
018 "Interacting Product and Labor Market Regulation and the Impact of Immigration on Native Wages" by Susanne Prantl and Alexandra Spitz-Oener, February 2014.

SFB 649, Spandauer Straße 1, D-10178 Berlin
http://sfb649.wiwi.hu-berlin.de

This research was supported by the Deutsche Forschungsgemeinschaft through the SFB 649 "Economic Risk".

SFB 649 Discussion Paper Series 2014

For a complete list of Discussion Papers published by the SFB 649, please visit http://sfb649.wiwi.hu-berlin.de.

019 "Unemployment benefits extensions at the zero lower bound on nominal interest rate" by Julien Albertini and Arthur Poirier, February 2014.
020 "Modelling spatio-temporal variability of temperature" by Xiaofeng Cao, Ostap Okhrin, Martin Odening and Matthias Ritter, February 2014.
021 "Do Maternal Health Problems Influence Child's Worrying Status? Evidence from British Cohort Study" by Xianhua Dai, Wolfgang Karl Härdle and Keming Yu, February 2014.
022 "Nonparametric Test for a Constant Beta over a Fixed Time Interval" by Markus Reiß, Viktor Todorov and George Tauchen, February 2014.
023 "Inflation Expectations Spillovers between the United States and Euro Area" by Aleksei Netšunajev and Lars Winkelmann, March 2014.
024 "Peer Effects and Students' Self-Control" by Berno Buechel, Lydia Mechtenberg and Julia Petersen, April 2014.
025 "Is there a demand for multi-year crop insurance?" by Maria Osipenko, Zhiwei Shen and Martin Odening, April 2014.
026 "Credit Risk Calibration based on CDS Spreads" by Shih-Kang Chao, Wolfgang Karl Härdle and Hien Pham-Thu, May 2014.
027 "Stale Forward Guidance" by Gunda-Alexandra Detmers and Dieter Nautz, May 2014.
028 "Confidence Corridors for Multivariate Generalized Quantile Regression" by Shih-Kang Chao, Katharina Proksch, Holger Dette and Wolfgang Härdle, May 2014.
029 "Information Risk, Market Stress and Institutional Herding in Financial Markets: New Evidence Through the Lens of a Simulated Model" by Christopher Boortz, Stephanie Kremer, Simon Jurkatis and Dieter Nautz, May 2014.
030 "Forecasting Generalized Quantiles of Electricity Demand: A Functional Data Approach" by Brenda López Cabrera and Franziska Schulz, May 2014.
031 "Structural Vector Autoregressions with Smooth Transition in Variances – The Interaction Between U.S. Monetary Policy and the Stock Market" by Helmut Lütkepohl and Aleksei Netsunajev, June 2014.
032 "TEDAS - Tail Event Driven ASset Allocation" by Wolfgang Karl Härdle, Sergey Nasekin, David Lee Kuo Chuen and Phoon Kok Fai, June 2014.
033 "Discount Factor Shocks and Labor Market Dynamics" by Julien Albertini and Arthur Poirier, June 2014.
034 "Risky Linear Approximations" by Alexander Meyer-Gohde, July 2014
035 "Adaptive Order Flow Forecasting with Multiplicative Error Models" by Wolfgang Karl Härdle, Andrija Mihoci and Christopher Hian-Ann Ting, July 2014
036 "Portfolio Decisions and Brain Reactions via the CEAD method" by Piotr Majer, Peter N.C. Mohr, Hauke R. Heekeren and Wolfgang K. Härdle, July 2014
037 "Common price and volatility jumps in noisy high-frequency data" by Markus Bibinger and Lars Winkelmann, July 2014
038 "Spatial Wage Inequality and Technological Change" by Charlotte Senftleben-König and Hanna Wielandt, August 2014
039 "The integration of credit default swap markets in the pre and post-subprime crisis in common stochastic trends" by Cathy Yi-Hsuan Chen, Wolfgang Karl Härdle, Hien Pham-Thu, August 2014

SFB 649, Spandauer Straße 1, D-10178 Berlin
http://sfb649.wiwi.hu-berlin.de

This research was supported by the Deutsche Forschungsgemeinschaft through the SFB 649 "Economic Risk".

SFB 649 Discussion Paper Series 2014

For a complete list of Discussion Papers published by the SFB 649, please visit http://sfb649.wiwi.hu-berlin.de.

040 "Localising Forward Intensities for Multiperiod Corporate Default" by Dedy Dwi Prastyo and Wolfgang Karl Härdle, August 2014.
041 "Certification and Market Transparency" by Konrad Stahl and Roland Strausz, September 2014.
042 "Beyond dimension two: A test for higher-order tail risk" by Carsten Bormann, Melanie Schienle and Julia Schaumburg, September 2014.
043 "Semiparametric Estimation with Generated Covariates" by Enno Mammen, Christoph Rothe and Melanie Schienle, September 2014.
044 "On the Timing of Climate Agreements" by Robert C. Schmidt and Roland Strausz, September 2014.
045 "Optimal Sales Contracts with Withdrawal Rights" by Daniel Krähmer and Roland Strausz, September 2014.
046 "Ex post information rents in sequential screening" by Daniel Krähmer and Roland Strausz, September 2014.
047 "Similarities and Differences between U.S. and German Regulation of the Use of Derivatives and Leverage by Mutual Funds – What Can Regulators Learn from Each Other?" by Dominika Paula Gałkiewicz, September 2014.
048 "That's how we roll: an experiment on rollover risk" by Ciril Bosch-Rosa, September 2014.
049 "Comparing Solution Methods for DSGE Models with Labor Market Search" by Hong Lan, September 2014.
050 "Volatility Modelling of CO2 Emission Allowance Spot Prices with Regime-Switching GARCH Models" by Thijs Benschop, Brenda López Cabrera, September 2014.
051 "Corporate Cash Hoarding in a Model with Liquidity Constraints" by Falk Mazelis, September 2014.
052 "Designing an Index for Assessing Wind Energy Potential" by Matthias Ritter, Zhiwei Shen, Brenda López Cabrera, Martin Odening, Lars Deckert, September 2014.
053 "Improved Volatility Estimation Based On Limit Order Books" by Markus Bibinger, Moritz Jirak, Markus Reiss, September 2014.
054 "Strategic Complementarities and Nominal Rigidities" by Philipp König, Alexander Meyer-Gohde, October 2014.
055 "Estimating the Spot Covariation of Asset Prices – Statistical Theory and Empirical Evidence" by Markus Bibinger, Markus Reiss, Nikolaus Hautsch, Peter Malec, October 2014.
056 "Monetary Policy Effects on Financial Intermediation via the Regulated and the Shadow Banking Systems" by Falk Mazelis, October 2014.
057 "A Tale of Two Tails: Preferences of neutral third-parties in three-player ultimatum games" by Ciril Bosch-Rosa, October 2014.
058 "Boiling the frog optimally: an experiment on survivor curve shapes and internet revenue" by Christina Aperjis, Ciril Bosch-Rosa, Daniel Friedman, Bernardo A. Huberman, October 2014.
059 "Expectile Treatment Effects: An efficient alternative to compute the distribution of treatment effects" by Stephan Stahlschmidt, Matthias Eckardt, Wolfgang K. Härdle, October 2014.
060 "Are US Inflation Expectations Re-Anchored?" by Dieter Nautz, Till Strohsal, October 2014.

SFB 649, Spandauer Straße 1, D-10178 Berlin
http://sfb649.wiwi.hu-berlin.de

This research was supported by the Deutsche Forschungsgemeinschaft through the SFB 649 "Economic Risk".

SFB 649 Discussion Paper Series 2014

For a complete list of Discussion Papers published by the SFB 649, please visit http://sfb649.wiwi.hu-berlin.de.

061 "Why the split of payroll taxation between firms and workers matters for macroeconomic stability" by Simon Voigts, October 2014.
062 "Do Tax Cuts Increase Consumption? An Experimental Test of Ricardian Equivalence" by Thomas Meissner, Davud Rostam-Afschar, October 2014.
063 "The Influence of Oil Price Shocks on China's Macro-economy : A Perspective of International Trade" by Shiyi Chen, Dengke Chen, Wolfgang K. Härdle, October 2014.
064 "Whom are you talking with? An experiment on credibility and communication structure" by Gilles Grandjean, Marco Mantovani, Ana Mauleon, Vincent Vannetelbosch, October 2014.
065 "A Theory of Price Adjustment under Loss Aversion" by Steffen Ahrens, Inske Pirschel, Dennis J. Snower, November 2014.
066 "TENET: Tail-Event driven NETwork risk" by Wolfgang Karl Härdle, Natalia Sirotko-Sibirskaya, Weining Wang, November 2014.
067 "Bootstrap confidence sets under model misspecification" by Vladimir Spokoiny, Mayya Zhilova, November 2014.
068 "Estimation and Determinants of Chinese Banks' Total Factor Efficiency: A New Vision Based on Unbalanced Development of Chinese Banks and Their Overall Risk" by Shiyi Chen, Wolfgang K. Härdle, Li Wang, November 2014.
069 "When the Taylor principle is insufficient - A benchmark for the fiscal theory of the price level in a monetary union" by Maren Brede, November 2014.
070 "The Politics of Related Lending" by Michael Halling, Pegaret Pichler, Alex Stomper, November 2014.

SFB 649, Spandauer Straße 1, D-10178 Berlin
http://sfb649.wiwi.hu-berlin.de

This research was supported by the Deutsche Forschungsgemeinschaft through the SFB 649 "Economic Risk".