

The effect of bank branch closures on Spanish municipalities

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Over the past decade there have been a large number of bank mergers and mass layoffs in Spain due to the consolidation of the sector. In this paper, we first study the extent to which these two phenomena lead to the closure of bank branches, and then we examine the repercussions of these closures on economic activity at the municipal level, particularly on the number of employment contracts signed. To do the latter, we exploit plausibly exogenous variation in the incidence of closings caused by the exposure to post-merger branch consolidation and to mass layoffs. The results show that merger activity leads to an increase in closures, but the effects of these closures on economic activity remain unclear.

ACCESS TO THE REPLICATION PACKAGE

The financial crisis led in Spain to a period of significant consolidation in the banking industry, as many banks were forced to close branches and lay off workers in order to adjust capacity and reduce costs after the strong expansion experienced in the previous years. Banks have closed more than 13,000 branches in the last 7 years as seen in figures [A2](#) and [A3](#), more than 34,000 employees have been laid off during the same period (20% of the total), and the total number of banks has gone from 55 in 2009 to the current 11 [Sobrinho \(2020\)](#).

These striking figures suggest that the consolidation process, represented by the closure of branches and mass layoffs, could have had significant effects on local communities, such as job losses, reduced

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access to financial services, or the loss of relationships between firms and lenders, to name a few. It is reasonable to consider the impact of these changes on the well-being of these communities.

The empirical challenge in estimating the local effects of branch closings is that the banks' closing decision is endogenous to local economic conditions that are correlated with local economic activity. In short, banks do not close branches at random. As a solution to this endogeneity problem, I use exposure to merger-induced consolidation as an instrument for branch closings. Additionally, I explore the use of mass layoffs as an alternative (or additional) instrument.

Merger-induced consolidation has already been used as an instrument in a range of industries, and in particular in the financial sector. For example, [Garmaise and Moskowitz \(2006\)](#) explore thoroughly the causal chain and analyze the impact of merger-induced changes in banks' local market power on real economic outcomes and crime. More recently, [Nguyen \(2019\)](#) uses a similar empirical strategy but employs a richer dataset and studies a novel mechanism. The author shows that branch closures can have large effects on local credit supply, even in dense banking markets, if they disrupt lender-specific relationships that are difficult to replace, and she concludes that geographic proximity and distance still matter even in the 2000s.

In this paper, I present reduced-form estimates of first, the extent to which mergers and mass layoffs lead to the closure of bank branches and second, the effect of closures on the total number of employment contracts signed, as a proxy to economic activity¹. I use a quasi-experimental research design to generate plausibly exogenous variation in the incidence of closings, by employing an instrument based on municipal-level variation in exposure to post-merger branch consolidation. To do this I leverage an underused dataset that contains information about bank branches at a quarterly frequency across the Spanish territory.

It is important for policymakers and researchers to first, understand the underlying factors leading to the closures and second, to carefully analyze the effects of these closures in order to understand

¹But ideally, I would be very much interested in analyzing the mechanisms, and in analyzing the economic impact more broadly.

their impact and to identify ways to mitigate any negative effects.

I. Related Literature and contribution

This paper is connected to several research areas in the fields of urban economics and industrial organization. First, it forms part of a broad literature that has studied the importance of the geographical distribution of bank branches. There are several studies that describe the factors that influence such location in Spain, for example, using a counting statistical models [Alam et al. \(2015\)](#).

Second, the closing of bank branches has been receiving increasing attention from both regulators and public opinion, especially regarding its impact on access to cash and financial services. It is not surprising that the Spanish regulator has published several descriptive papers about the branch closures that occurred in the last years [Concha Jimnez Gonzalo \(2018\)](#)².

Third, and connecting more closely with my paper, there are some studies about the impact of bank branches on economic activity. As already mentioned, some of this literature uses mergers as an instrument to get causal estimates, but other studies have used different exogenous shocks such as liquidity windfalls from oil and natural gas shale discoveries [GILJE, LOUTSKINA and STRAHAN \(2016\)](#). However, most of this research is done for the US, and for what has been explained so far, results obtained in the US may not translate well to the very particular Spanish setting.

Fourth, many studies analyze the impact of mergers at the aggregate level and with the assistance of some structural model [Bernad, Fuentelsaz and Gomez \(2010\)](#) but very few contemplate how mergers affect branches, the main channel through which banks look after customers. My paper analyses the relatively unexplored channel of how bank mergers can impact the economy through the increase in branch closures.

Lastly, the role of mass layoffs in the banking consolidation and their broad effect, has received

²Even after the digitalization process, as of 2018 the use of cash was still preferred by 53% of the population to other payment methods. That is to say, it is still a more relevant topic than one could think.

wide attention in the national press but to the best of my knowledge, there are no economic studies analyzing this phenomenon in the banking sector. Apart from the methodological innovation of using mass layoffs as an instrument, I study how EREs have affected the closures of Spanish bank branches. This is policy-wise relevant since the Labor Ministry has the competency of not authorizing the EREs if it estimates it is convenient to do so.

II. Data

The **main data source** is the Registry of branches of supervised entities provided by the Bank of Spain (BdE). This dataset provides quarterly information about the location of every bank branch in Spain, including the municipality, the address, and the financial entity to which it belongs; for the period that goes from the first quarter of 2015 to the second quarter of 2022³. As a side note, the dataset has two limitations: First, it does not provide the geolocation of the branches. I used the Google Maps API to get it based on the stated address of the branch⁴. Second, branches do not have an identifier and thus it has to be constructed based on information from the data. From this dataset we can obtain quarterly information about the total number of branches, closures, and openings of branches for every municipality as well as the number of distinct entities operating the branches.

To construct the exposure instrument, I gather data on the merger activity of Spanish banks that come mostly from public statements from the buyer's bank. I show in table A1 information about every merger that occurred during the period. It's not trivial how to set the starting point of a merger as it can have an effect on the results. I use the quarter in which the merger was approved by the Board of Directors of the buyer's entity since it is a well-defined and easy-to-identify milestone based on publicly available data.

The other instrument used, mass layoffs, is captured by the Spanish figure of Employment adjust-

³For each year we use the first and the third quarter so we get a total of 15 time periods.

⁴This process is not perfect but the error is small (around 0.5% of the branches are not correctly geocoded due to the address information being invalid or incomplete).

ment processes (EREs). We focus on this particular kind of layoff because the data needed can be obtained from publicly shared documents released by unions, which typically provide information on the number of workers affected, the reasons for the adjustment and the proposed measures for managing the process. But more importantly, the EREs have some characteristics that convert them in a good instrument for branch closings. I show in table [A2](#) information about the most important EREs that occurred during the period.

Annual municipal-level data on population and number of firms come from the Instituto Nacional de Estadística (INE) ⁵. Similar data, such as administrative tax income records or the geographical area of each town come from the Spanish Tax Agency and the Registro de Entidades locales respectively. Additionally, I calculate the median distance between branches in the municipality using the geolocation of each branch. To provide evidence on the real labor market effects of branch closings -the variable of interest-, I use data regarding the number of employment contracts provided by the Public Employment Service Estate (SEPE). More detailed information about these data sources can be found in the Readme file of the replication package.

The **final dataset** consists of a balanced panel of a total of 1750 municipalities, 1055 of which are exposed to closures induced by at least one of the four mergers, and 659 are part of the control group (never exposed) from 2015 to 2022 (15 quarters).

III. Empirical strategy and identification

The empirical framework compares the pre-and post-merger level of the number of contracts in “exposed” municipalities (those that had branches from both merging banks prior to the merger) relative to a set of control municipalities that have branches belonging to at least two large merging banks.

⁵Atlas distribution project (2020) from INE is another data source that is worth exploring in the future since it contains rich demographic indicators at the census track level.

A. Relationship of interest

The **relationship of interest** is the effect of bank closures on the number of contracts signed half a year ahead ($t+1$) at the municipal level. Ideally, in the case in which we could select a sample of bank branches randomly from the Spanish geography in map [A1](#), we could use the following specification:

$$(1) \quad y_{lt} = \alpha_l + \gamma_t + \beta \mathbf{X}_{lt} + \delta \text{Closure}_{lt} + \epsilon_{lt}$$

Where y_{lt} is the total number of contracts for municipality l at quarter t , α_l are municipal fixed effects, γ_t are quarter fixed effects, \mathbf{X}_{lt} is a vector of municipality characteristics that change over time, and Closure_{lt} is a dummy equal to one if a branch closes in municipality l in quarter t .

However, this is not possible since in practice the exogeneity assumption for Closure_{lt} is unlikely to hold as shocks to the local labor market will affect both the level of employment contracts and the profitability of local bank branches (and thus generating an omitted variable bias problem).

B. Quasi-experiment

To generate plausibly exogenous variation in the incidence of branch closings, I use exposure to post-merger consolidation as an instrument for closings. This instrument is relevant because bank mergers are often followed by a period of retrenchment during which the merged institution closes branches in areas where the two previously separate bank branches overlap. This implies that areas with both buyer and acquired bank branches are at greater risk of a post-merger closing. The **identifying assumption** is that the incidence of the merger is plausibly exogenous to local economic conditions in municipalities where both merging banks have a branch.

C. Control group of the quasi-experiment

To infer the causal effects of closures accurately, a credible counterfactual is needed. A natural starting point is to consider all unaffected municipalities as potential controls. The problem is that municipalities exposed to mergers are much more populated and have more branches than the average Spanish municipality. Therefore, to get a more comparable **control group** I use only those municipalities that have branches of at least two of the banks that have participated in a merger during the analyzed period. However, as results seem sensitive to the selection of the control group, more thought should go into this. The idea is to compare municipalities that, a priori, were equally likely to have been exposed to a large bank merger.

D. Mass layoffs

The type of mass layoff that we use, called ERE or **Expediente de Regulación de Empleo**, is a Spanish term for a procedure that companies can use to lay off workers. It is typically used when a company is facing financial difficulties and needs to reduce its workforce in order to remain financially viable. The ERE process allows companies to lay off workers in a legally sanctioned manner, and it includes provisions for severance pay and other benefits for affected workers.

Following the same procedure as done with mergers, we can think of exposure to post-ERE consolidation as a plausibly exogenous variation in the incidence of branch closings. The incidence on closings is large in the Spanish case since first, there are a massive number of employees affected as seen in table [A2](#) and second, traditionally Spanish bank branches have very few employees and so it is more likely that a branch gets understaff and has to close. Moreover, the instrument is plausibly exogenous for several reasons. First, after the ERE is announced, a negotiation process begins, and the Ministry of Labor has the final say. The second reason is that most of the employees that are let go do so voluntarily through early retirement or voluntary leaves.

Equivalent to merger exposure, as "exposed" municipalities we consider those that have at least

two branches of a bank carrying out an ERE process. Similarly, as a control group, we use all the municipalities that have at least two branches belonging to big banks⁶, as they are the ones more prone to do EREs. Again, the identifying assumption is that municipal-level exposure to an ERE is as good as randomly assigned.

E. Main specification

I estimate year-by-year DD and present all the results as event study plots, which is useful to gauge the overall pattern of the impact of bank closures. The **main specification** used throughout the results is based on [Nguyen \(2019\)](#) and is the following:

$$(2) \quad y_{lmt} = \alpha_l + \gamma_t + \beta_t \mathbf{X}_l + \sum_{\tau=-8}^8 \delta_\tau (D_{mt}^\tau \cdot Exposure_{lt}) + \epsilon_{lmt},$$

Where y_{lmt} is the total number of contracts for municipality l at quarter t and for merger m , α_l are municipal fixed effects, γ_t are quarter fixed effects, \mathbf{X}_l is a vector of municipality characteristics pre-merger and the set of interactions \mathbf{X}_l, β_t allows the quarter fixed effect to differ by linear pre-merger characteristics; D_{mt}^τ is an indicator equal to 1 if, as of quarter t , the municipality experienced the approval of merger m , τ quarters ago. Lastly, $Exposure_{lt}$ is a dummy equal to one if municipality l is an exposed town for merger m . The coefficient of interest are δ_τ , which estimate the difference, conditional on controls, in outcome y between exposed and control municipalities τ years after the merger. I normalize the effect in the year before the merger's approval ($\tau = -1$) to zero and I cluster the standard errors at the municipal and quarter period level. Following this equation, the identifying assumption is that $E(\epsilon_{lmt} | X, D, Exposure) = 0$

The estimation of the coefficients in plot 2 is first done using the standard procedure in the software package *fixest* [Bergé \(2018\)](#) and then using the correction for heterogeneous fixed effects

⁶In terms of the number of branches. However, more research would be needed to define a more precise group.

proposed by [Sun and Abraham \(2021\)](#). The results show the estimates obtained by this latter procedure unless otherwise stated.

Lastly, as we can see signs of pre-trends in [A6](#) we refrain from using a more standard DiD (and less flexible) specification as its estimates would not be reliable enough.

IV. Results

A. How mergers and EREs induce bank branch closures

This first subsection shows evidence by using event study plots of the first-stage relationship between exposure to consolidation (and mass layoffs) and the incidence of branch closings using the specification shown in equation 2. Figure [A4](#) presents the point estimates δ_τ for the dependent variable number of branch closings; for the period that goes from $\tau = -8$ (4 years before the merger) to $\tau = 8$ (4 years after). Since the results of the standard year-by-year DD estimation were strikingly different from the estimation using [Sun and Abraham \(2021\)](#) I show both estimates⁷. In Panel B we can see that the number of closings increases significantly by more than 0.2 branches the two years posterior to the exposure to a merger. After that, the effect falls back to zero and so in the long run exposed municipalities are no more likely than controls to experience a closing. Overall this plot shows the relevance of a merger as an instrument. Additionally, if instead of analyzing branch closings we use total branches or total banks as the dependent variables we find similar results: Merger incidence decreases the total number of branches and banks of the municipality in the quarters posterior to the exposure. Moreover, the results are robust to changes in the controls although there is some evidence of pre-trends.

For the EREs case, the evidence is much weaker and the results are less robust to changes in the sample and control variables. Still, in figure [A5](#) we can see that those municipalities that have been exposed to an ERE have 0.43 more branch closures three months later than those municipalities

⁷In all the remaining plots I only show the points estimates obtained taking into account heterogeneous treatment effects.

not exposed.

B. Impact of closings on the number of employment contracts

In this second subsection, we want to see if the branch closing (or mass layoffs) has any effect on the number of employment contracts signed two quarters later in the municipality. We continue using the same equation 2 but change the dependent variable to the number of employment contracts. Unfortunately, not many conclusions can be obtained from figure A6. The estimates are not statistically significant and at the same time, they are not very precise. Further research should be done to improve the precision and to get a clearer picture. Moreover, if we use exposure to mass layoffs instead of exposure to a merger as an instrument, we get similar results.

V. Conclusion

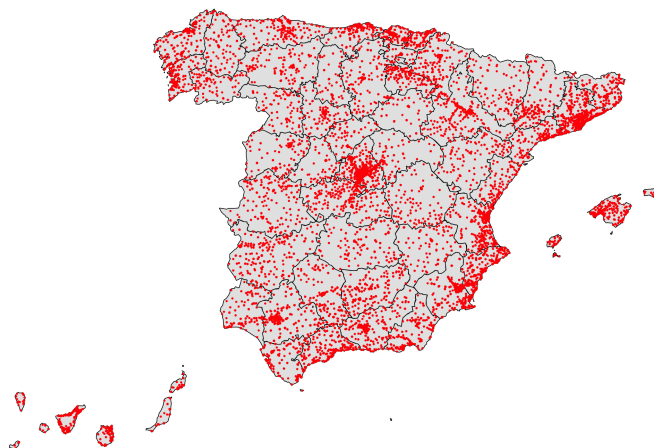
I study how mergers and mass layoffs, which are commonly national-level events, induce the closure of branches at the municipal level, and how these closures translate into an impact on the number of contracts signed locally. The number of employment contracts is used as a proxy in an effort to get a sense of the impact on the broader economic activity.

The results show that affected municipalities close, on average, around 0.25 more branches during the three quarters following exposure to a merger, compared to municipalities that are not exposed. For the exposure to mass layoffs, there is some evidence of an impact only in the quarter following the exposure. However, the impact of closures on the number of total employment contracts remains unclear. There is still work to be done to improve the precision of the estimates and to improve the selection of the control groups. Moreover, note that the paper is silent about the possible mechanisms that could explain the possible impacts. As a separate note, it would be worth investigating the role of EREs in banking consolidation and how to better integrate this phenomenon with the merger data. There is a lack of literature on this topic, and figure A5 suggests that EREs can potentially induce closures. However, this is outside the scope of this study.

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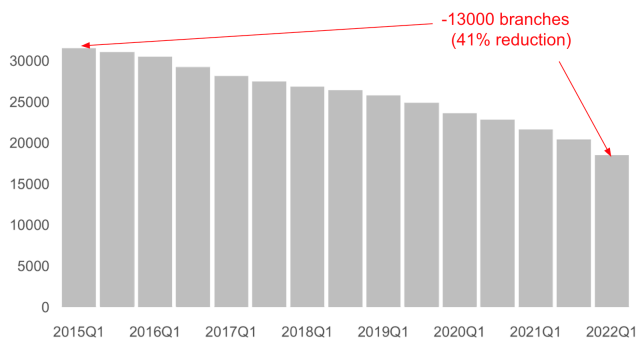
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Bank branches distribution in 2015

**Figure A1. :** Bank branches distribution in 2015

Note: The map shows the geographical distribution of Spanish bank branches. They are scattered across all the territory but especially in more populated areas. There is a literature that studies how banks distribute geographically their branches.

Source: Registry of branches of supervised entities from BdE and Google Maps API for the geocoding.

**Figure A2. :** Evolution of the number of branches during the analyzed period

Note: The peak in the number of branches was in 2008 with a total of 45,662. It has been declining rapidly since then due to the consolidation of the sector.

Source: BdE

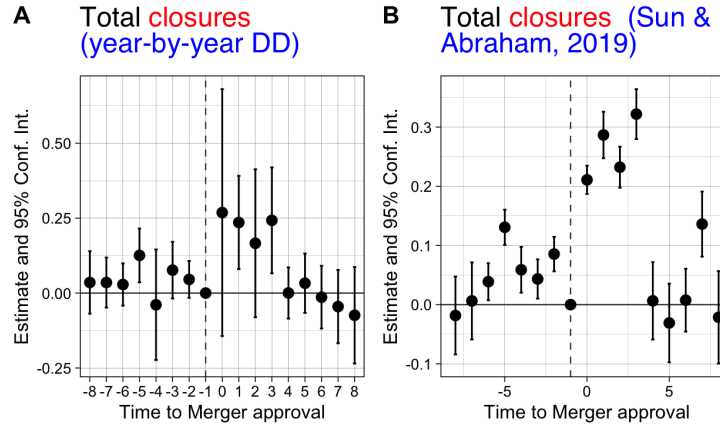
Transition of branches at every quarter wrt the previous one



Figure A3. : One-period branch transitions

Note: As is evident, during the period there were many more closures than openings. Still, there are opening possibly because of the new strategy implemented by banks that consisted in reducing small branches and opening fewer but bigger ones.

Source: BdE

Figure A4. : Estimates for τ from eq. 2 for the exposure to post-merger branch consolidation

Note: The analyzed variable is bank branch closures at the municipal level. Both panels show the same estimates (same coefficients and dependent variable) but using different estimation methods. The reference period is one quarter before the merger is approved by the Board of Directors of the buyer's bank. Note: $\delta_{tau} > 0$ indicates a higher incidence of branch closing in exposed municipalities relative to controls τ years after the merger's approval.

Table A1—: Summary of the mergers that occurred during 2015-2021

Buyer	Acquired	Approval from Board	Fusion of branches in the data
BBVA	Catalunya Banc	31/03/2016	2016 Q3
Bankia	Mare Nostrum	14 /09/2017	2018 Q1
Santander	Popular	24/04/2018	2018 Q3
Caixabank	Bankia	17/09/2020	2021 Q1

Note: A total of four mergers provide the identifying variation for the branch closures. Most of the mergers post-financial crisis were done during the period 2009-2012 but these mergers done in the latter period are the biggest and affected a very high number of branches.

Source: Public statements from the buyer's bank.

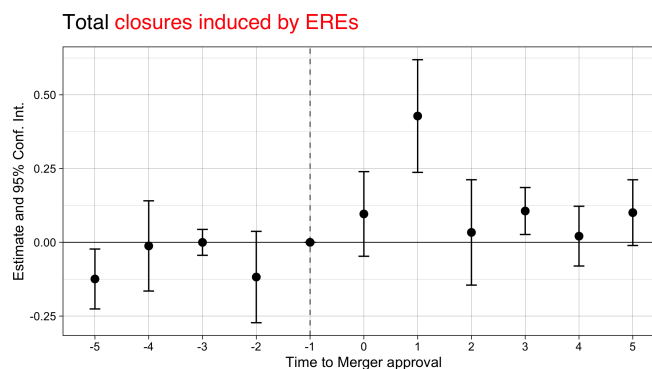


Figure A5. : Estimates for τ from eq. 2 for the the exposure to an ERE

Note: The analyzed variable is bank branch closures at the municipal level. The reference period is one quarter before the ERE is carried out.

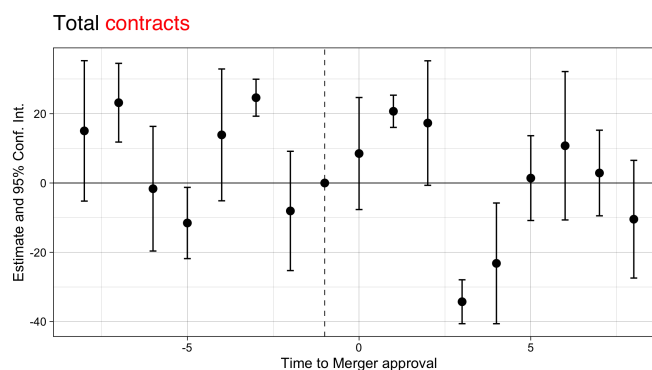


Figure A6. : Estimates for τ from eq. 2 for the closures induced by the exposure to post-merger branch consolidation

Note: The analyzed variable is total number of employment contracts signed at the municipal level. The reference period is one quarter before the merger is approved by the Board of Directors of the buyer's bank.

Table A2—: Information about the EREs for the period 2016-2021

Year	Bank	Employees laid off	Industry's share (%)
2016	POPULAR	2592	1.33
2017	SANTANDER	1100	0.58
2018	BANKIA	2000	1.07
2019	CAIXABANK	2023	1.11
2019	SANTANDER	3223	1.78
2020	SABADELL	1800	1
2020	SANTANDER	3572	1.99
2021	BBVA	3800	2.26
2021	CAIXABANK	8291	4.92

Note: These are some of the most important EREs during the period of analysis. Note that the last column represents the total number of layoffs with respect to the whole industry. For example, in 2021 the ERE of Caixabank will let go the 4.9% of the employees working in the financial sector.

Source: The number of employees laid off is based on publicly shared documents from unions. The total number of employees in the financial sector comes from data from the BdE.