BANK BRANCHES AND LENDING IN THE EURO AREA – A PANEL ANALYSIS

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Abstract: *Since the Great Financial Crisis, the number of bank branches has decreased significantly as credit institutions have sought to cut costs and increase efficiency. However, such developments may have adverse effects on households' access to finance. Using a panel dataset for the Euro area from 2010 to 2023, this paper aims to uncover how the changes in bank branch density have affected lending growth. Our results indicate that, after controlling for a series of macroeconomic and financial indicators, a reduction in bank branch density of 10 per 100,000 people leads to a decrease of 0.2% in the yearly growth rate of mortgage loans. These developments have important consequences both for the health of the banking sector and the real-estate sector, as well as households' welfare and ability to build wealth. On the other hand, the reduction of bank branches did not affect consumer loan issuance.*

Keywords: *mortgage lending, banking, finance, panel data.*

JEL classification: *G51; E58; C35; D14*.

1. Introduction and Literature Review

Access to finance for households is an important component for building wealth, especially regarding mortgage financing. However, the trend in the Euro Area since the Great Financial Crisis has been the reduction of the number of branches, as banks sough to cut costs and move their activity online. For example, the average number of bank branches per 100,000 people in 2010 was 42, while by 2023 it had decreased to 19 per 100,000 people. Furthermore, as shown in Figure 1, there exists a significant heterogeneity between countries, with some countries such as Spain, Luxembourg and Cyprus experiencing a decrease twice as large as the average, while in other countries such as Slovakia, Croatia and Austria the density of branches was mostly stable. By leveraging on these cross-sectional differences, this paper strives to prove that this structural shift has had a negative impact on access to finance for households.

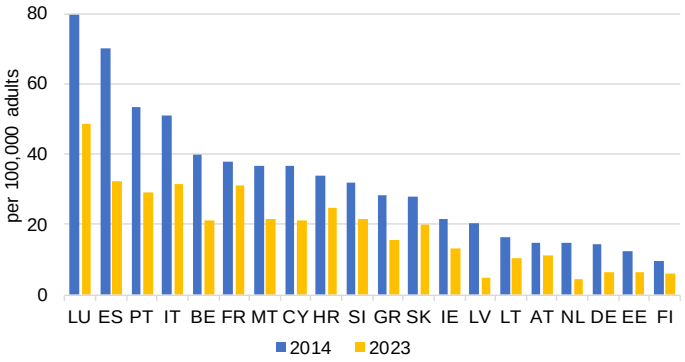

Figure 1: The evolution of commercial bank branches density in the Euro area over time
Source: World Bank, World Development Indicators

Access to credit is an important avenue, especially for low-income debtors, to build wealth by investing in real-estate. Given that most households have invested their wealth in their homes, access to mortgage finance can have significant consequences on households' long-term well-being. However informational asymmetries and lack of financial literacy may prevent borrowers from accessing credit in case of branch closures. Jiang et al. (2023) show that branch closures have asymmetric effects, impacting to a greater extent older and poorer borrowers, as they have less access to technology to supplement services of bank branches through online banking. Barca and Hou (2024) show that this trend was exacerbated by the COVID-19 pandemic which supported banks to shifting operations online, while Richardson et al (2017) show that in the US branch closures affected disproportionately census tracts which were predominantly rural or had high proportions of minorities. Additionally, Koont (2023) shows that banks which introduce a digital platform offer more loans to high income borrowers, while on the liability side they rely more on uninsured deposits.

On the other hand, Ergundor (2010) finds that the existence of branches of bank branches in low-income neighborhoods has positive effects on mortgage issuance, both in terms of issuance volumes, as well as interest rates charged. Ergundor and Moulton (2014) demonstrate that mortgages issued to lower-income debtors by banks with a physical preference have a lower probability of default compared to similar mortgages issued by nonlocal banks. Agarwal et al. (2018) find that relationship banking leads to a marked improvement in terms of default and attrition rates for credit cards, while increasing utilization rates. Gilje et al. (2017) demonstrate that bank branches pay an important role in integrating local credit markets by attracting deposits in counties which benefited from the shale oil boom and allowing increased supply of mortgage loans in other regions where these banks have a physical presence.

This paper contributes to the literature in three ways. First of all, most studies presented focus on single geographic entities, especially on the United States. By

performing a panel analysis of Euro area countries, our analysis sheds light on the effect of branch closures in an international context. Second of all, our analysis spans a long period of time (10 years) and thus is able to offer longer term predictions regarding the effect of bank branch presence on access to finance. Finally, by controlling for both banking sector characteristics, as well as macroeconomic developments on the national level, we are able to isolate the effect of bank branch density on issuance of mortgage loans.

2. Methodology

In order to estimate the impact of bank branch density on mortgage loan origination, this paper will use a yearly panel model. We run two separate estimations. Firstly, we analyze the impact of bank branch density on mortgage lending. Consequently, the dependent variable is the 1-year growth rate of mortgage loans at the national level, as calculated from the Monetary Financial Institutions Balance Sheet Items in the Statistical Data Warehouse. Secondly, we look at the impact of bank branches on consumer lending, thus the dependent variable in our second set of estimations is the 1-year growth of consumer loans.

Additionally, we include our controls sequentially. Initially we only include country fixed effects, besides our variable of interest which is the number of commercial bank branches per 100,000 adults. The second specification also includes banking sector controls such as CET 1 capital ratio, NPL ratio, return on equity and cost of mortgage borrowing. These are important as banks with higher capitalization and profitability are more likely to lend. On the other hand, if the NPL rate is high or if the costs of borrowing increases, banks are less likely to lend. These indicators are taken from the Consolidated Banking Data in the Statistical Data Warehouse. Finally, we also include macroeconomic controls such as real GDP growth, unemployment rate and price growth of residential real-estate. All controls are included with a 1-year lag. By using these controls, we ensure that we control for both supply-side factors related to the health of the banking sector, as well as demand-side factors related to the health of the residential real-estate market and general economic conditions. The relevant descriptive statistics can be found bellow in Table 1.

Table 1: Descriptive statistics

Name	Source	Number of observations	Mean	Standard deviation	Median
1 year growth rate of mortgage loans	Statistical Data Warehouse	199	0.9	4.6	1.2
1 year growth rate of consumer loans	Statistical Data Warehouse	199	0.9	9.8	1.1
Commercial bank branches /number per 100,000 adults	World Bank	199	25.5	16.4	22.9
CET1 capital ratio	Statistical Data Warehouse	199	17.8	4.3	17.0
NPL ratio	Statistical Data Warehouse	199	5.4	7.9	2.5
Return on Equity	Statistical Data Warehouse	198	6.7	7.1	7.6
HH Composite cost of mortgage borrowing	Statistical Data Warehouse	189	2.4	1.0	2.3
Real GDP growth	Eurostat	199	2.6	3.9	2.3
Unemployment rate	Eurostat	199	8.0	4.2	6.8
Residential real estate price growth (nominal., y-o-y)	Eurostat	199	5.4	5.6	5.2

The empirical specification is a yearly panel level as show bellow

$$\text{Yearly growth rate}_{i,t} = \beta_0 + \beta_1 * \text{Bank branch density}_{i,t} + \beta_2 * \text{Financial controls}_{i,t} + \beta_3 * \text{Macro controls}_{i,t} + \text{Country Fixed effects}_i + \varepsilon_{i,t}$$

For the first specification, the *Yearly growth rate*$_{it}$ refers to mortgage loans, while the *Financial sector controls*$_{it}$ include CET1 capital ratio, NPL ratio, Return on Equity and Composite cost of mortgage borrowing. Furthermore, *Macro controls*$_{i,t}$ refer to Real GDP growth, unemployment rate and residential real estate price growth. For the second specification, *Yearly growth rate*$_{it}$ refers to consumer loans, while the *Financial sector controls*$_{it}$ include CET1 capital ratio, NPL ratio and Return on Equity, while *Macro controls*$_{i,t}$ include Real GDP growth, unemployment rate.

3. Results

Analyzing the results in Table 2, we observe that the coefficient relating to bank branch density is positive and significant in all specifications. Taking into account all controls, a reduction of 10 branches / 100,000 persons results in a -2% lower mortgage credit growth. Given that the overall change was -13 branches /100,000 persons between 2014 and 2023, we can conclude that this the reduction of bank branches had an impact of approximately -2,6% on credit growth and consequently

on household welfare and ability to build wealth. Furthermore, as mentioned in the introduction, some countries have experienced much larger reductions of bank branches (Spain -37 branches / 100,000 people, Luxembourg -31 branches / 100,000 people and Portugal -25 branches / 100,000 people). For these jurisdictions, the cumulative impact would be between -5% and -7%, representing a significant decrease in mortgage issuance. This also has important consequences on the profitability of the banking sector which is expected to face lower profitability due to lower volumes, as well as the real economy as acquisitions through credit are an important channel to support demand for residential real estate. Thus, the reduction in bank branches is expected to have exacerbated the real-estate slowdown in the aftermath of the Great Financial Crisis, leading to a vicious cycle.

Table 2: The impact of bank branch density on yearly mortgage growth

	(1)	(2)	(3)
Commercial bank branches /number per 100,000 adults	0.119***	0.166***	0.204***
	(0.037)	(0.048)	(0.053)
CET1 capital ratio		0.102	0.128
		(0.113)	(0.113)
NPL ratio		-0.071	-0.016
		(0.056)	(0.080)
Return on Equity		-0.136***	-0.139***
		(0.048)	(0.049)
Real GDP growth			-0.156**
			(0.071)
Unemployment rate			-0.218
			(0.231)
RRE price growth			0.025
			(0.064)
Observations	198	174	174
R-squared	0.539	0.559	0.574
Country FE	Yes	Yes	Yes
R2	0.539	0.559	0.574
Likelihood	-501.5	-436	-433

Source: Own calculations

Going further, we examine the impact of bank branch density on consumer loans. Unlike mortgages, the coefficient here is statistically insignificant. Given the rising importance of online banking and the possibility to access consumer loans directly through such online services, our show that the physical presence of branches does

not play an important role in regard to consumer loan issuance. Furthermore, consumer loans are typically standardized products which are accepted or declined immediately based on the credit-scoring of the debtor. On the other hand, applications for mortgages are much more complex, as they require numerous legal documents, as well as a thorough analysis of the debtor's finances. Consequently, the importance of bank branches is much greater for mortgage loans in order to reduce the information asymmetry, while for consumer loans the process can be automatized and conducted remotely.

Table 3: The impact of bank branch density on yearly consumer loan growth

	(1)	(2)	(3)
Commercial bank branches /number per 100,000 adults	-0.102 (0.104)	-0.102 (0.120)	-0.114 (0.137)
CET1 capital ratio		0.081 (0.305)	0.004 (0.307)
NPL ratio		0.223 (0.155)	0.304 (0.206)
Return on Equity		0.268** (0.133)	0.242* (0.134)
Real GDP growth			0.295 (0.191)
Unemployment rate			-0.248 (0.525)
Observations	188	187	187
R-squared	0.292	0.311	0.323
Country FE	Yes	Yes	Yes
R2	0.292	0.311	0.323
Likelihood	-666.9	-660.8	-659.1

Source: Own calculations

4. Conclusion

Using a country-level dataset for the Euro between 2010 and 2023, we have shown that the reduction of bank branch density has had an important effect on mortgage lending. Given that most households build wealth through home ownership, these developments highlight the negative consequences that branch closures have had on households' welfare. Given the existence of asymmetric information, bank branches play an important role in filling that gap and supporting

credit issuance, especially to low-income households. On the other hand, the closure of bank branches has not had an effect on consumer lending. As these loans are more standardized and can be accessed online, the importance of physical branches is much lower compared to consumer loans. Further developments of this study may aim analyze the distributional consequences of branch closures, by evaluating mortgage and consumer loan issuance by income class.

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