

Cooperative versus Commercial Banks in Greece: A Comparative Analysis of Credit Policy

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ABSTRACT

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This study compares the credit policies of Greek cooperative and commercial banks using firm-level balance-sheet data for more than 20,000 companies drawn from the ICAP database over the period 2014–2016. We examine how lending differs by sector, firm size, and financial robustness. Descriptive evidence shows that cooperative banks primarily serve small and medium-sized enterprises (SMEs). We then estimate a logit model in which the dependent variable indicates whether a firm is financed exclusively by commercial banks, using financial ratios capturing coverage, activity, profitability, and liquidity. The results suggest that firms with stronger financial fundamentals—especially higher interest coverage—are more likely to be financed by commercial banks, while cooperative banks tend to serve financially weaker firms. These findings are consistent with the relationship-based role of cooperative banks during the crisis period in Greece.

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1. Introduction

In Greece, cooperative banks play a much smaller role than commercial banks in terms of deposits and loans. Beyond their limited market share, it is often argued by practitioners and policymakers that cooperative banks differ in governance and credit allocation, relying more on relationship lending and supporting local small and medium-sized enterprises (SMEs). This has also been supported in the past by official statements, such as those made by the Deputy Governor of the Bank of Greece during his speech at the E.S.T.E. conference on "The New Banking Landscape and the Role of Cooperative Banks" on July 10, 2018 (Bank of Greece, 2018).

This paper investigates whether such differences are reflected in actual lending outcomes. Using firm-level data from the ICAP database for the period 2014–2016—a time characterized by deep recession and severe financial stress—we compare the clients of cooperative and commercial banks in terms of sectoral allocation, firm size, and financial robustness. The descriptive evidence on how lending across productive sectors relates to the structure of the Greek economy is summarized in Section 3, while the detailed sector–GDP alignment analysis is reported in **Appendix**.

The international and Greek-focused literature contains extensive research on non-performing loans (NPLs). NPLs contribute to financial instability (Makri et al., 2014), and despite numerous empirical studies, the phenomenon remains a persistent issue (Naili & Lahrichi, 2020). Evidence further suggests that banks with smaller balance sheets are more vulnerable to elevated NPL ratios (Louzis et al., 2012), and a negative relationship has been documented between bank size and NPLs (Salas & Saurina, 2002). Additionally, a negative relationship appears to exist between ownership concentration and impaired loans (Shehzad et al., 2010).

Regarding loan evaluation criteria, prior research indicates that small banks rely more on relationship-based factors and soft information when screening borrowers (Uchida, 2011; Stein, 2002). The literature further suggests that large banks are less efficient in collecting and utilising soft information, whereas relationship banking implemented by smaller banks mitigates information asymmetry (Boot, 2000). Cooperative banks have therefore been argued to possess a comparative advantage in relationship lending (de la Torre et al., 2008). However, studies also report that credit risk management (CRM) systems are not widely adopted by Cooperative banks (Aduda & Obondy, 2020), and their absence has even been cited as a contributing factor to institutional failures (Mugo, Muathe &

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Waithaka, 2019). Conversely, case evidence from Banca di Credito Cooperativo (BCC) di Napoli demonstrates that Cooperative banks can successfully combine hard and soft information in their lending decisions (Caldarelli et al., 2015).

Our analysis addresses three questions. First, does the share of firms financed by cooperative banks reflect their small market presence in Greece? Second, do cooperative banks primarily serve SMEs and professionals, in line with their statutory objectives and with the sectoral patterns of Greek economic activity (see **Appendix**)? Third, and most importantly, are firms financed by cooperative banks financially weaker than those financed exclusively by commercial banks?

To answer the last question, which constitutes the main empirical focus of the paper, we estimate a logit model using standard accounting ratios associated with credit risk. By doing so, we provide evidence on whether the observed differences in loan portfolio quality between cooperative and commercial banks can be linked to the financial characteristics of their borrowers.

The remainder of the paper is structured as follows. Section 2 describes the methodology and the econometric specification. Section 3 presents the data and the main descriptive patterns, with supplementary sectoral evidence in **Appendix**. Section 4 discusses the empirical results. Section 5 concludes, offering policy implications and directions for future research.

2. Methodology

We employ a logistic regression (logit) model to analyze the relationship between firm financial characteristics and the type of bank financing they receive. The dependent variable is binary and defined as: $Y_i = 1$ if firm i is financed exclusively by commercial banks; $Y_i = 0$ if firm i has any exposure to cooperative banks.

Firms with multiple banking relationships that include at least one cooperative bank are classified in the cooperative-exposed group. With this definition, odds ratios greater than one indicate a higher likelihood of exclusive commercial bank financing.

The estimated model is:

$$P(Y_i = 1) = \Lambda(\beta_0 + \beta_1 \ln(\text{Coverage}_i) + \beta_2 \ln(\text{Activity}_i) + \beta_3 \ln(\text{Profitability}_i) + \beta_4 \ln(\text{Liquidity}_i))$$

where $\Lambda(\cdot)$ denotes the logistic cumulative distribution function.

The ratios are defined as:

Coverage = EBITDA / Financial expenses (main variable),

Activity = Sales / Total assets (control variable),

Profitability = Earnings after tax / Total assets (control variable),

Liquidity = Cash / Current liabilities (control variable).

All ratios are expected to be positively related to firm sustainability.

These ratios are widely used in the credit risk literature (e.g., Beaver, 1968; Altman and Sabato, 2007; Doumpos et al., 2019) and are expected to be positively related to firm sustainability. Hence, if cooperative banks tend to finance weaker firms, higher values of these ratios should be associated with a greater probability of exclusive commercial bank financing (i.e., positive coefficients or odds ratios above one).

3. Data and Descriptive evidence

3.1 Data

The dataset is drawn from the ICAP database and includes balance-sheet information for more than 20,000 Greek firms with bank loans over 2014–2016. Firms operate across all productive sectors of the economy. Each firm is classified according to whether it is financed by cooperative banks, commercial banks, or both.

3.2 Distribution of firms by bank type

Examining our research questions sequentially, it arises for our first question that, based on the data we draw from the ICAP database, Cooperative banks finance approximately 1.44% of the sample of 20,000 Greek businesses, while the remaining large percentage (98.56%) draws loans from Greek Commercial banks as shown in Table 1.

Table 1. Distribution of financed companies among Banks

	Number of Companies	Percentage (%)
financing from cooperative bank	290	1,44
financing from commercial bank	19912	98,56
Total	20202	100

This aligns with the real-world economic scenario and the market shares that Greek Cooperative banks manage to gather compared to Commercial banks. As seen in Table 2, Cooperative banks' market shares in granted loans are very small and significantly lower than those of Cooperative banks operating in the European context (EACB,2022).

Table 2. Market Shares of Cooperative Banks in granted Loans in Europe

<i>Country/ Year</i>	<i>2014</i>	<i>2015</i>	<i>2016</i>
GERMANY	20,10	20,70	21,10
SPAIN	6,61	6,80	7,10
FRANCE	59,00	59,00	59,20
GREECE	0,8	0,8	0,8
ITALY	7,30	7,20	7,20
AUSTRIA	33,74	35,80	32,90
PORTUGAL	3,70	4,20	4,50
FINLAND	32,80	34,30	35,40
BULGARIA	3,30	4,00	4,30

3. 3 Sectoral allocation and firm size

Commercial banks finance firms across sectors in proportions broadly aligned with each sector's contribution to Greek GDP. Cooperative banks, in contrast, exhibit a stronger focus on the secondary sector and on SMEs, consistent with their statutory mandate to support artisans, small manufacturers, and local professionals (see **Appendix**).

Large enterprises (sales above €50 million) are almost exclusively clients of commercial banks. Only four (4) of such firms in the sample have any cooperative bank exposure, and even then within multiple-bank relationships dominated by commercial lenders.

3. 4 Crisis context

The period under study coincides with severe financial distress in Greece, characterized by a prolonged recession, declining investment, and a rapid deterioration in bank asset quality. Non-performing loans in business portfolios exceeded 50% by 2016, constraining banks' capacity to extend new credit and forcing a strong focus on balance-sheet repair.

Based on records from the Bank of Greece regarding NPLs of business loans, the following table emerges (Bank of Greece, 2023):

Table 3. Non-performing business loans in Greek banking system

DATE	NPLs
DEC/2014	43,20%
MAR/2015	43,70%
JUN/2015	45,50%
SEP/2015	47,10%
DEC/2015	50,60%
MAR/2016	51,10%
JUN/2016	51,40%
SEP/2016	51,90%
DEC/2016	51,20%
MAR/2017	51,40%

Additionally, according to the deputy governor of the Bank of Greece, the NPLs of Cooperative banks are significantly higher than those of Commercial banks. Thus, in March 2017, the NPLs of Cooperative banks reached 57.60% and those of Commercial banks 45.20%. This fact indicates a lag in the quality of the loan portfolio of Cooperative banks. This lag can partly be explained by the fact that the clients of Cooperative banks are predominantly SMEs and small professionals, categories that follow higher NPL rates than usual, as we will see in the following table.

Table 4. Ratios of non-performing loans by customer category in the Greek banking system

Client/Date	Sep/2015	Mar/2017
S.M.E	58,20%	59,00%
Professional	66,50%	68,00%
Business loan	47,10%	51,40%

It is understood that based on the examination of NPLs of Greek banks, and separating them into those held by Cooperative banks on one side and those held by Commercial banks on the other, there is a noticeable difference exceeding 10 percentage points.

In this paper, we will use a logit regression. Through the logit regression, we will try to prove whether the lag in the loan portfolio of Cooperative banks, as suggested by the statements of official Bank of Greece officials, can be based on numerical data derived from published financial statements of a large sample of Greek businesses.

The ratios we use in our model are drawn from articles dealing with the credit risk of businesses. In simple terms, credit risk refers to the likelihood that a borrower (obligor) will not meet future debt obligations in accordance with the terms agreed when credit was provided by a lender (Doumpos et al., 2019). Thus, models that include ratios are used for prediction. One disadvantage that should be mentioned is the fact that, as argued by Altman and Sabato (2007), models used for credit risk tend to be more accurate if they incorporate qualitative variables of the businesses under examination, a fact that was not possible in our model as such information was not available in our database.

Our main variable, ebitda/financial expenses, is defined as the coverage of financial expenses and is a coverage ratio. According to Andrews, McGowan, and Millot (2017), the higher this ratio for a business, the more sustainable the business is. In their article titled: "The walking dead? Zombie firms and productivity performance in OECD countries," non-viable businesses are defined as those with a financial expenses coverage ratio of less than one for three consecutive years. This ratio is also used by Altman and Sabato (2007).

Continuing, the ratio Sales/Total Assets, which is characterized as an activity ratio, has a positive correlation with the efficiency of the business, as its increase indicates a stronger business. According to Georgopoulos and Benos (2010), it measures the ability of the business to use its assets to generate sales. Apart from the article: "Evaluation of Creditworthiness of Listed Companies: A Comparative Analysis" by the above authors, this ratio is also used in other studies such as Doumpos et al. (2019), which examine the techniques for evaluating credit risk, and in the credit policy manual for the business portfolio of Piraeus Bank (2023).

The ratio of earnings after tax/total assets is a coverage ratio and has a positive correlation with the sustainability of the business. It is used by Altman and Sabato (2007) for the credit risk of SMEs in the USA, as well as by Beaver (1967) and Edmister (1972).

Finally, the ratio Cash/Current liabilities, encountered as the Quick ratio in Doumpos et al. (2019), is a liquidity ratio that, according to Georgopoulos and Benos (2010), measures the ability of the business to use its cash to cover its short-term liabilities. It also has a positive relationship with the sustainability of the business.

Summarizing regarding the ratios used in the model, the following table emerges:

Table 5. Categorization of model variables and their correlation with business sustainability

Ratio	Ebitda/financial expenses=x1	Sales/total assets=x2	Earning after tax/total assets=x3	Cash/current liabilities=x4
Accounting ratio category	coverage	activity	Profitability coverage	Liquidity
Relation to sustainability	positive	positive	Positive	Positive

3. 5 The Impact of 2015 Capital Controls of Greek Commercial and cooperative banks

In June 2015, the Greek government imposed capital controls following heightened sovereign risk and massive deposit outflows from the banking system. These measures included limits on cash withdrawals, restrictions on domestic and international transfers, and a temporary bank holiday. The imposition of capital controls had a profound impact on banks' liquidity positions and lending behavior, further tightening credit conditions in an already fragile economy (Bank of Greece, 2016; ECB, 2015).

For commercial banks, which were heavily exposed to government bonds and dependent on Eurosystem funding, capital controls coincided with a sharp contraction in new lending, particularly to small and medium-sized enterprises (SMEs). Credit supply became increasingly selective, with banks prioritizing larger and more creditworthy firms and focusing on balance-sheet repair amid rapidly rising non-performing loans (Bank of Greece, 2017; Gibson et al., 2019).

Greek cooperative banks, although much smaller in scale, were also affected by the controls. Their deposit bases were constrained, and access to wholesale and central bank funding was limited compared to systemic banks. At the

same time, their strong local orientation and relationship-based business model meant that many cooperative banks continued to support existing SME and professional clients, often rolling over credit lines rather than expanding new lending (Mitrakos, 2018; EACB, 2016). However, this strategy exposed them disproportionately to weaker borrowers during the downturn, contributing to persistently higher non-performing loan ratios relative to commercial banks in the subsequent years.

The capital controls episode is therefore critical for interpreting our empirical results. The tendency of cooperative banks to finance financially weaker firms during 2014–2016 may reflect not only their statutory mission but also their role as lenders of last resort for local SMEs facing severe credit constraints from commercial banks. Consequently, the estimated relationships between firm financial ratios and bank type should be understood within this exceptional institutional and macroeconomic environment.

4. Empirical results

Table 8 reports odds ratios from the logit regressions estimated separately for each year from 2014 to 2016. The dependent variable equals one when a firm is financed exclusively by commercial banks.

The results show that the **coverage ratio (EBITDA/financial expenses)** has odds ratios significantly greater than one in 2014 and 2015. This indicates that firms with stronger ability to service interest expenses are more likely to be financed exclusively by commercial banks. In other words, cooperative banks tend to serve firms with weaker interest coverage.

The **liquidity ratio (cash/current liabilities)** exhibits odds ratios below one and is statistically significant in several specifications, suggesting that firms with lower liquidity are less likely to be financed exclusively by commercial banks and more likely to have cooperative bank exposure.

Profitability is positive and significant in some years, while the activity ratio is generally not statistically significant. Overall, the evidence supports the view that cooperative banks, during the period examined, tended to finance financially weaker firms relative to those served exclusively by commercial banks. This pattern is consistent with the relationship-based model of cooperative banking and with their focus on SMEs during a period of economic stress.

Table 8. Logit Regression Results

Y	Odds Ratio	p-value
Logx1/2014	1.234454	0.000*
Logx2/2014	0.9569841	0.658
Logx3/2014	0.9425927	0.470
Logx4/2014	0.8298681	0.002*
Logx1/2015	1.156269	0.010*
Logx2/2015	0.9094078	0.488
Logx3/2015	1.179179	0.037*
Logx4/2015	0.7680285	0.001*
Logx1/2016	1.116647	0.206
Logx2/2016	1.015092	0.940
Logx3/2016	1.249859	0.045*
Logx4/2016	0.7277158	0.017*

5. Conclusions and policy implications

This study compares cooperative and commercial banks in Greece using firm-level data for 2014–2016. The descriptive analysis confirms that cooperative banks primarily serve SMEs and professionals and hold a very small share of total lending. The econometric results provide evidence that firms financed by cooperative banks are, on average, financially weaker than those financed exclusively by commercial banks, particularly in terms of interest coverage and liquidity.

These findings are consistent with the higher non-performing loan ratios observed for cooperative banks during the same period and suggest that portfolio quality differences partly reflect borrower characteristics rather than solely bank-level practices.

Policy Implications

Cooperative banks play an important role in providing credit to financially constrained SMEs, especially in times of crisis. Preserving this role is essential for local economic development. At the same time, the evidence suggests that cooperative banks could benefit from strengthening their screening and monitoring processes, for example through greater adoption of CRM systems and the integration of quantitative credit-scoring tools, while maintaining relationship lending advantages.

From a regulatory perspective, proportional supervision and targeted technical assistance could help cooperative banks upgrade risk management without undermining their cooperative mission.

Limitations and Future Research

A key limitation is that our analysis focuses on the crisis period of 2014–2016, including the episode of capital controls. Therefore, the results should be interpreted as crisis-specific. Future research should extend the analysis to post-restructuring years (e.g., 2017–2020 or later) to assess whether these patterns persist under more stable conditions.

Moreover, incorporating qualitative information—such as firm age, management quality, and relationship length—could further improve understanding of credit allocation. Exploring multinomial models that distinguish exclusive and multiple banking relationships would also be a fruitful avenue for future work.

Appendix. Sectoral Alignment between Bank Lending and Greek GDP

This appendix provides supplementary descriptive evidence on the alignment between the sectoral distribution of bank-financed firms and the structure of the Greek economy, as measured by sectoral contributions to gross domestic product (GDP). The purpose is to assess whether cooperative and commercial banks allocate credit across sectors in proportions consistent with overall economic activity.

1 Sectoral Structure of Greek GDP

Table 3 reports the contribution of the primary, secondary, and tertiary sectors to Greek GDP for the period 2014–2016, based on ELSTAT data.

Table 3. Participation of the productive sector of the Greek economy in its GDP

Year/Sector	Primary	Secondary	Tertiary
2014	4,00%	15,90%	80,10%
2015	4,30%	16,40%	79,30%
2016	4,00%	16,60%	79,40%

The Greek economy is clearly dominated by the tertiary sector, which consistently accounts for around 80% of GDP, while the secondary sector contributes about 16% and the primary sector around 4%.

2 Sectoral Distribution of Bank-Financed Firms

Table 4 presents the shares of firms financed by cooperative and commercial banks in 2016 across the same productive sectors. The percentages represent shares within each bank-type sample.

Table 6. Shares of financed firms within each bank type sample, 2016

Bank/Sector	Primary	Secondary	Tertiary
Cooperative	6,50%	38,30%	55,20%
Commercial	3,90%	26,00%	70,10%

3 Discussion

A comparison of Tables 3 and 4 reveals notable differences in sectoral orientation between cooperative and commercial banks. Commercial banks' lending is more closely aligned with the structure of Greek GDP, particularly in the dominant tertiary sector, which accounts for about 80% of output and roughly 70% of commercial-bank-financed firms.

In contrast, cooperative banks display a pronounced emphasis on the secondary sector, which represents only about 16–17% of GDP but accounts for more than 38% of cooperative-bank-financed firms. Cooperative banks also allocate a smaller share of lending to the tertiary sector relative to its weight in the economy. This pattern suggests a stronger focus on manufacturing, small-scale industry, and artisan activities, consistent with the statutory objectives and regional development role of Greek cooperative banks.

The primary sector, although small in terms of GDP contribution, receives a slightly higher share of cooperative bank financing than commercial bank financing, reflecting the local orientation of cooperative institutions toward agriculture and rural activities.

Overall, the appendix supports the view that cooperative banks do not mirror the aggregate structure of the economy in their sectoral credit allocation, but instead concentrate on specific productive activities and SMEs. This reinforces the interpretation in the main text that cooperative banks pursue a differentiated, relationship-based lending strategy rather than broad market coverage.

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