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FINANCIAL DEVELOPMENT AND ENTREPRENEURSHIP: THEORY AND EVIDENCE FOR INTERNATIONAL DATA IN THE CONTEXT OF BANK DIVERSITY

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SUMMARY

"There is a saying: "This time it's different". But financial history teaches us that this time is never different. The financial system may change shape, innovation may run rampant, but the fundamental risks — excessive leverage, lack of liquidity, panic — remain essentially the same. Regulation is not about stifling innovation, but about ensuring that it does not destroy the stability on which we all depend."
Christine Lagarde (President of the ECB) - ECB Annual Research Conference

The financial system is a complex infrastructure that enables households, businesses, governments and other economic agents to make payments, transfer resources and manage risks. It is an infrastructure that is subject to continuous stress from economic developments and technological innovation. Ensuring the smooth functioning of this architecture is the task of the authorities responsible for financial stability. In general, the main function of the financial system is to facilitate the transfer of resources from savers ("surplus units") to those in need of funds ("deficit units"). In a well-designed financial system, resources are allocated efficiently (i.e. resources are directed to the most productive and innovative companies with the best growth prospects).

The financial system plays a central role in the production and dissemination of information. In fact, intermediaries do not merely move resources around, but also contribute to the evaluation of projects, companies and Countries. In this regard, they synthesise expectations about growth, inflation and solvency through stock and bond prices, sovereign spreads and risk premiums. In this way, they provide signals that guide investment decisions and project selection. Finance therefore performs a service of aggregating information (dispersed among many operators) and monitoring. On a global scale, these signals influence international capital flows and, therefore, the ability of countries to finance investment and public spending at sustainable costs. At the same time, the quality of information and transparency becomes a determinant of the confidence and attractiveness of national markets.

A second aspect concerns liquidity and maturity transformation, i.e. the possibility of financing long-term activities with shorter-term and more liquid liabilities. This

function is essential for the real economy because many socially desirable investments - research and development, energy transition - have long time horizons. Consequently, without adequate financial instruments, the gap between the time of saving and the time of investment would make such projects rarer and more expensive. On the other hand, the production of liquidity exposes the economy to systemic vulnerabilities (bank runs, stress on money markets), which justify the existence of safety nets and prudential regulation. In other words, liquidity is a fundamental but fragile economic asset. In this sense, it requires reliable infrastructure, risk management and a stabilising role for the authorities to prevent temporary shocks from becoming solvency crises through illiquidity dynamics.

At the macroeconomic level, the financial system is crucial for the credit channel and for the transmission of monetary and financial conditions to the real economy. When banks and markets function smoothly, changes in interest rates and expectations are reflected in loans, investment and consumption in a predictable manner. When financial fragility increases, however, shocks are amplified. Indeed, credit crunches, financial rationing and reduced risk-taking propensity can dampen demand. In this sense, finance is not neutral but can act as a mechanism for propagating recessions and influencing the dynamics of the economic cycle.

This **Thesis** examines, both empirically and theoretically, how financial development affects entrepreneurship while taking into account the function of various bank types.

Chapter 1 addresses a series of issues that are crucial to understanding the international financial system. First, it analyses the process of building the Banking Union, which is structured around three fundamental pillars: the Single Supervisory Mechanism (SSM), the Single Resolution Mechanism (SRM) and the still unfinished European Deposit Insurance Scheme (EDIS) project. In this context, the centralisation of supervision at the European Central Bank and the creation of instruments for managing banking crises have been decisive steps towards financial stability. However, the absence of a common deposit guarantee scheme continues to be a vulnerability that fuels fragmentation and weakens savers' confidence.

Chapter 1 addresses a series of issues that are crucial to understanding the international financial system. First, it analyses the process of building the Banking Union, which is structured around three fundamental pillars: the Single Supervisory Mechanism (SSM), the Single Resolution Mechanism (SRM) and the still unfinished European Deposit Insurance Scheme (EDIS) project. In this context, the centralisation of supervision at the European Central Bank and the creation of instruments for managing banking crises have been decisive steps towards financial stability. However, the absence of a common deposit guarantee scheme continues to be a vulnerability that fuels fragmentation and weakens savers' confidence. Then **Chapter 1** focuses on the phenomenon of shadow banking, i.e. the set of intermediaries that perform banking functions without being subject to the same prudential rules. Its rapid growth in Europe after 2010, driven by mutual funds, securitisation vehicles and money market funds, has broadened the sources of financing. At the same time, this has increased the systemic risks associated with leverage and maturity transformation. The liquidity crisis of 2020 highlighted these vulnerabilities, making clear the need for more effective and coordinated macroprudential monitoring at the supranational level.

Based on these premises**, Chapter 2** is based on a heterogeneous and unbalanced international dataset, which includes observations from 51 countries (both developed and developing) over the period 2006–2020[1]. The dataset combines economic, banking, and entrepreneurial data, with an emphasis on the role of two main categories of financial intermediaries: commercial banks and cooperative and credit union banks. Key indicators include entrepreneurship, measured by the number of new business registrations per 1000 working-age inhabitants (15–64 years), and the level of financial development, represented by the number of branches of commercial, cooperative and credit union banks per 100,000 inhabitants and per 1000 km^2. In addition, macroeconomic control variables such as GDP, trade

[1] Chapter 2 is drawn from previously published work (Barra & D'Aniello, 2025: Does banking diversity matter on the financial development-entrepreneurship nexus? Evidence from developed and developing countries. *Journal of Evolutionary Economics,* 35(2), 281-308).

openness, education level, population density, and government spending are included to capture structural differences between countries.

Finally, **Chapter 3** proposes a theoretical model about the impact of financial development on entrepreneurship. Comparing the equilibrium level of loans granted by the two types of banks, we can assert that cooperative banks contribute more to the expansion of local entrepreneurship for certain levels of members and borrowers. Moreover, higher is the competition the more cooperative banks must behave like *borrower-oriented banks* to contribute more to the growth of local firms. Finally, **Chapter 3** concludes by empirically validating the theoretical model's predictions using data from a global, balanced sample of 10 developing countries between 2006 and 2021, considering information on two important categories of financial intermediaries: commercial and cooperative.

CHAPTER 1

International Financial System: EU Vs. Non-EU Countries

Abstract

Chapter 1 reconstructs the evolution of the international financial system, with specific emphasis to the comparison between European Union countries and non-EU countries. After going over the process of establishing the Banking Union, this chapter discusses the advancements achieved through the creation of the Single Supervisory Mechanism and the Single Resolution Mechanism. In addition, it also highlights the limitation represented by the absence of a common European deposit guarantee program. The analysis also focuses on the expansion of shadow banking in Europe and the vulnerabilities associated with unregulated intermediation activities. Another crucial aspect that will be discussed is the structural role of European SMEs, who rely mostly on bank credit and European measures to diversify sources of funding.

1.1 Introduction

The financial system is a complex infrastructure that enables households, businesses, governments and other economic agents to make payments, transfer resources and manage risks. It is an infrastructure that is subject to continuous stress from economic developments and technological innovation. Ensuring the smooth functioning of this architecture is the task of the authorities responsible for financial stability. A primary function of the financial system is to facilitate the transfer of resources from savers ("surplus units") to those in need of funds ("deficit units"). In a well-designed financial system, resources are allocated efficiently (i.e. resources are directed to the most productive and innovative companies with the best growth prospects) (Saunders et al., 2022; Mishkin & Eakins, 2018).

In the context of the global economy, financial systems can be classified into two broad models: (i) the market-based system and (ii) the bank-based (Saunders et al., 2022; Mishkin & Eakins, 2018).This distinction is not merely theoretical, but has concrete implications for the economic development, business structure and financial stability of different countries. The United States is an emblematic case of a capital market-based economy, while Europe is a paradigmatic example of a bank-based system.

On the one hand, the US financial system reflects a combination of historical, institutional and regulatory factors that have favored the development of highly sophisticated financial markets that are deeply integrated into the national economy. In this type of economy, there is a predominance of instruments such as stocks, bonds, private equity and venture capital, which offer companies a wide range of alternative financing options to bank credit. In the US model, there is a strong development of the stock market, which is one of the main sources of financing for companies. The largest and most liquid stock markets in the world are, in fact, the New York Stock Exchange (NYSE) and NASDAQ, which attract both domestic and international capital. In this regard, US companies, from large multinationals to start-ups, frequently use initial public offerings (IPOs) and share issues to raise funds directly from investors (Saunders et al., 2022). We are witnessing this phenomenon because there is a strong financial culture and therefore share ownership is widespread among the population, partly due to the presence of pension funds and mutual funds that channel people's savings into the financial markets. In parallel, the US boasts the largest and most sophisticated corporate bond market in the world, with a wide range of debt instruments available to corporations, from investment-grade bonds to high-yield bonds. In addition, the US Treasury Bonds market is a pillar of the global financial system, providing a benchmark for interest rates and serving as a store of value for institutional investors and central banks around the world. In this US financial system, we also find the centrality of venture capital and private equity in the financing of companies, especially start-ups and high-growth companies (Beck & Levine, 2002). Silicon Valley is the global epicenter of venture capital, with billion-dollar investments fostering the birth and

expansion of technologically innovative companies. This dynamic allows companies to access large amounts of capital without resorting to traditional bank credit, stimulating the growth of capital-intensive sectors such as technology, biotechnology and artificial intelligence. The dominance of capital markets in the US is facilitated by a regulatory and institutional framework that incentivises the use of financial instruments. Indeed, the Securities and Exchange Commission (SEC), the financial markets regulator, ensures transparency and investor protection by imposing strict disclosure requirements on listed companies (Beck et al., 2009). At the same time, the US tax system offers incentives to invest in venture capital, and the absence of overly restrictive banking regulation has allowed a dynamic financial industry to develop, with strong competition between banking institutions, investment funds and non-bank financial intermediaries. In the US, there is a more developed financial market for smaller companies, which is the case of the NASDAQ market. The Nasdaq (National Association of Securities Dealers Automated Quotations) is one of the world's leading market infrastructures. It is the first fully electronic stock exchange and a benchmark platform for companies operating in technologically advanced sectors. It is organized as a “dealer market”, where dealers act as market makers by buying and selling securities for their own accounts through an electronic network. The decentralized architecture of the Nasdaq has fostered competition among intermediaries, which has encouraged both improved trading conditions and technological innovation in order execution. The Nasdaq is strongly oriented towards companies operating in technology-intensive sectors such as software, semiconductors, biotechnology, digital communications, and online platforms. This sector bias means that the main affiliated indices, in particular the Nasdaq Composite and the Nasdaq-100, are used as benchmarks for measuring the performance of global technology sectors and as leading indicators of the economic cycle linked to innovation. It offers a platform for growing companies that want to raise capital from investors, while the private debt segment allows unlisted companies to obtain financing from specialised funds. This model reduces dependence on the banking sector and increases the resilience of the economic system, as banking crises have less impact on corporate financing than in Europe (Boot & Thakor, 2008).

However, the US financial system is not without its vulnerabilities. The high dependence on capital markets exposes companies and the economy to financial volatility. The 2008 and 2020 crises have shown how fluctuations in the stock and bond markets can have immediate repercussions on the economic system, adversely affecting investor confidence and credit availability. The global financial crisis of 2008, also known as the "subprime mortgage crisis," was triggered primarily by the collapse of the US real estate market and the progressive deterioration of mortgage-backed securities (MBS) and collateralized debt obligations (CDOs). During the early 2000s, financial intermediaries expanded the issuance of high-risk mortgages to households with poor creditworthiness. This was supported by inadequate assessment of the probability of default and excessive reliance on imperfect credit rating methodologies. The securitization of these loans dispersed the risk throughout the financial system, amplifying its opacity and interconnectedness. When house prices began to fall and default rates rose, the value of structured products collapsed. This weakened the balance sheets of major financial institutions and triggered a severe liquidity crisis. The collapse of Lehman Brothers in September 2008 marked the peak of the crisis, triggering a global contraction in credit supply, a decline in asset prices, and a deep recession (Demirgüç-Kunt & Levine, 2001). The 2020 financial crisis, on the other hand, originated from an exogenous shock: the COVID-19 pandemic. Unlike the 2008 crisis, which stemmed from endogenous financial imbalances, the turmoil of 2020 emerged from the abrupt halt in economic activity caused by widespread lockdown measures. The sudden interruption of production and consumption generated extreme uncertainty about corporate cash flows and household income prospects. Financial markets reacted with unprecedented volatility. In fact, stock prices plummeted, credit spreads widened sharply, and liquidity became scarce in several market segments, including those traditionally considered safe, such as Treasury securities markets. The rapid deterioration in financial conditions led to a significant tightening of credit and an increase in refinancing risks for both businesses and households (Rajan & Zingales, 2003). Another critical element concerns the inequality of access to credit and financial markets. Although the US system offers ample financing opportunities for innovative and technology companies, traditional small businesses and low-income

households may find it difficult to access capital. Dependence on financial markets means that companies with a high level of innovation and rapid growth prospects are more likely to attract investors, while companies with more traditional business models may struggle to raise funds (Hardie & Howarth, 2013).

In contrast to market-based systems, as we have already mentioned, we distinguish the bank-based systems in which bank credit is the main source of financing for businesses, especially small and medium-sized enterprises (SMEs), which often find it difficult to access financial markets. Banks operate as intermediaries that collect deposits from savers and transform them into long-term loans for businesses, reducing information asymmetries and providing monitoring services. This structure has the advantage of offering stability in times of economic turbulence, as banks tend to maintain long-term relationships with businesses and adopt a more gradual approach to market shocks. However, a bank-based system may suffer from rigidity and be overly dependent on the soundness of the banking sector, as evidenced by the 2008 financial crisis, in which the collapse of many European banking institutions had prolonged recessionary effects (Levine, 2002).

On the other hand, the European banking system is characterised by a high degree of institutional heterogeneity that reflects the different banking and regulatory traditions of individual countries. In Italy, for instance, the banking system is composed of large commercial banking groups and a significant number of cooperative and popular credit banks (the latter with very similar characteristics), which play a crucial role in SME financing. While commercial banks mainly operate with a profit rationale and are often owned by private investors or shareholders, cooperative banks follow a mutualistic model, where customers are also members and participate in the management of the institution (Chakraborty & Ray, 2006). Structurally, commercial banks are generally for-profit organisations, often large. Their main objective is to maximise shareholder returns, which leads them to develop strategies based on loan portfolio growth, expansion in financial markets and revenue diversification through services such as investment banking, asset management and trading. In contrast, cooperative banks have a democratic ownership structure, where each member has one vote regardless of the capital

invested. Their main mission is not profit maximisation, but to support the economic development of local communities by offering credit on favourable terms to their members (Demirgüç-Kunt & Maksimovic, 2002). The two types of banks also differ in their funding model. Commercial banks raise funds mainly through customer deposits and financial markets, issuing debt securities or raising capital from shareholders. This exposes them more to market fluctuations, making them more vulnerable to global financial crises. Cooperative banks, on the other hand, rely mainly on members' deposits and a self-financing model, reducing their dependence on financial markets. This more conservative approach generally makes them more stable in times of economic turbulence, although it may limit their capacity for expansion and innovation. Another aspect of differentiation is the way loans are disbursed and credit risk management. Commercial banks adopt advanced assessment models that are based on quantitative criteria and customer credit ratings (Vitols, 2001). This approach allows them to expand their loan volume, but may be less attentive to the specificities of small local businesses or customers with a limited credit history. Cooperative banks, on the other hand, operate with a more relational logic, i.e. loans are granted on the basis of direct knowledge of the customer and on the contribution to the local community. This model favours access to credit for small enterprises and individuals with a less established credit profile, but may expose cooperatives to higher risks in the event of local economic crises (Levine, 1999). In addition, commercial banks, being often systemically important institutions, are also subject to stricter regulations on capital requirements set by institutions such as the European Central Bank (ECB) and the Basel Committee on Banking Supervision. Cooperative banks, on the other hand, although regulated, generally operate in a less stringent regulatory environment, as their business model is considered less risky for the economy (Mishkin & Eakins, 2018). The level of innovation and digitalisation also varies between the two types of institutions. Commercial banks, thanks to their larger financial resources, invest significantly in digital transformation, offering advanced online services and fintech solutions to optimise banking processes. Cooperative banks, although they have initiated digitalisation processes, tend to be slower in adopting new technologies due to their smaller size and lower investment capacity. However, their focus on personal

customer relationships remains a strength that differentiates them from large commercial banks (Mäkinen & Jones, 2015). Finally, a key aspect concerns resilience and response to financial crises. Commercial banks, being exposed to global financial markets, can suffer severe losses during crises, as demonstrated by the 2008 crisis, which saw the failure of large institutions such as Lehman Brothers. Cooperative banks, on the other hand, thanks to their prudential model, have generally withstood economic turmoil better, continuing to provide credit to local economies even in difficult times (DeYoung et al., 1998).

Germany instead adopts a three-pillar model that takes the name of Drei-Säulen-Modell, consisting of private commercial banks, public savings banks (Sparkassen) and cooperative banks (Genossenschaftsbanken), which ensure a balanced distribution of credit across the territory (Behr & Schmidt, 2015, 2017).

Private commercial banks operate according to a profit-oriented business model and serve both private and corporate clients, offering a wide range of services, from retail banking to corporate and investment banking. Private commercial banks are characterised by greater exposure to international financial markets and a shareholder-based ownership structure, which means that their primary objective is to maximise value for investors (Behr & Schmidt, 2015, 2017). However, unlike other highly concentrated banking systems, in Germany these banks do not hold a dominant position in the domestic market, but compete with a large number of local and regional institutions. The second pillar of the system is the public banks, which include the Sparkassen (savings banks) and Landesbanken (publicly owned regional banks). Sparkassen operate at the local level and are owned by public institutions, such as municipalities and regions. Their main objective is not profit maximisation, but the promotion of territorial economic development by ensuring access to credit for small and medium-sized enterprises (SMEs) and households. The principle of the Sparkassen is regionality, which means that they operate exclusively within a given territory and cannot expand beyond the boundaries of their area of competence. This ensures a strong connection to the local economic fabric and greater stability in times of financial crisis (Hüfner, 2010). Landesbanken, on the other hand, serve as second-tier institutions for savings banks and operate as

regional investment banks, offering financing services for large projects and support for local economies. Historically, Landesbanken have played a key role in financing infrastructure and supporting German exports, but have faced significant difficulties in recent decades due to their increasing exposure to global financial markets. The 2008 crisis particularly affected some Landesbanken that had invested in risky assets, leading to bailouts by the German government and a subsequent restructuring of the sector (Hoggarth et al., 2001). The third pillar of the German banking system is the cooperative banks (Genossenschaftsbanken), which include the Volksbanken and Raiffeisenbanken. These institutions operate according to the principle of mutuality, in which customers are also members of the bank and participate in its governance through a democratic system (one member, one vote). Their business model is based on deposit-taking and local lending, with a strong focus on financing small businesses, agriculture and artisans. Cooperative banks reinvest profits in the community and offer favourable credit conditions to their members. From the point of view of risk and financial stability, the Drei-Säulen-Modell has shown remarkable resilience, as the diversification among the three banking segments makes it possible to balance the effects of economic crises (Guinnane, 2002). Sparkassen and Genossenschaftsbanken, with their business model less exposed to speculative finance, provided important support to the real economy during the global financial crisis of 2008 and the COVID-19 pandemic, when private commercial banks reduced lending due to increased macroeconomic uncertainty .

In France, the banking system is characterised by a structure of large universal banks, cooperative banks and savings banks. As one of the leading economies in the Eurozone, it has a highly developed and diversified banking sector, in which banks not only play a key role in financing the real economy, but are also key players in global financial markets (Bertero, 1994; Lepetit et al., 2017). The French banking model has been influenced by progressive deregulation since the 1980s, which led to the creation of large, multifunctional banking groups capable of competing with international financial institutions (Hardie & Howarth, 2009).

Universal banks represent the largest segment of the French banking sector. These institutions adopt a diversified business model that integrates retail banking,

corporate banking and investment banking. Their strength lies in their ability to offer a wide range of financial services, including deposit management, lending, corporate advisory services, asset management and financial market trading (Bertero, 1994; Lepetit et al., 2017). Unlike other countries where investment banking activities are separate from retail banking (as in the United States under the Glass-Steagall Act, repealed in 1999), French banks operate as universal banks, combining several business lines within the same institution. This model makes it possible to diversify income sources and mitigate risks by offsetting any losses in one line of business with profits generated by another (De Bandt & Oung, 2004). However, it also exposes banks to increased operational complexity and systemic risks, as evidenced during the 2008 financial crisis, when exposure to derivative markets put some institutions in trouble. In addition to universal banks, a central role is also played by cooperative and mutual banks, which are characterised by governance based on the principle of mutuality and customer-member participation. These institutions have a long historical tradition and were created with the aim of supporting the local economy and communities by offering credit on favourable terms to households, farmers, small businesses and artisans. Their business model is based on a network of independent regional banks, which operate with a strong autonomy but are nevertheless linked to a central institution that guarantees their financial stability and access to capital markets (Bertero, 1994). Another important player in the French banking sector are the savings banks (Caisses d'Épargne), which operate with a logic similar to the German Sparkassen. These institutions have a public interest mission and specialise in financing local projects, providing loans and supporting the public sector. Traditionally, the Caisses d'Épargne were exclusively oriented towards collecting deposits and granting loans for social housing, but over time they have broadened their offer to include retail and investment banking services (Marchetti & Sabetta, 2010).

This diversity between countries reflects not only the different historical developments of national financial systems, but also the different degree of government intervention and the structure of the real economy (Fernandez-Bollo, 2013).

The comparative analysis of the market-based and bank-based model suggests that there is no superior system in an absolute sense, but rather that each financial structure has strengths and weaknesses. In European contexts, the bank-based model has historically favoured industrial growth and stability of the economic system, while in the US, the market-based model has allowed for greater dynamism and faster allocation of capital to innovative sectors. However, recent years have seen a gradual convergence between the two models, i.e. Europe is seeking to develop capital markets through initiatives such as the Capital Markets Union (CMU), while the US is implementing stricter regulations to reduce the risks of financial instability. This convergence reflects the increasing interconnectedness of global financial markets and the need to combine the benefits of both models to create a more resilient and efficient system (Beck et al., 2009).

In what follows, the choice to focus exclusively on European countries is motivated by a number of economic and institutional reasons. First of all, we seek to ensure institutional comparability and consistency in the measurement of financial and economic indicators, avoiding distortions resulting from too marked structural differences between world economies. One of the main reasons for adopting this geographical delimitation is the relative institutional and regulatory homogeneity that characterises the European financial system. The European Union (EU) is subject to a common regulatory framework, with banking and financial regulations (such as the Markets in Financial Instruments Directive - MiFID II) harmonised by institutions such as the European Central Bank (ECB), the European Banking Authority (EBA) (Saunders et al., 2022; Mishkin & Eakins, 2018). This regulatory framework ensures consistent supervisory standards across member states, allowing for a more robust analysis of the relationships we will analyse during this research work. On the contrary, including non-European economies, which adopt different financial regulations (e.g. the Dodd-Frank Act in the US), would have made data comparison and assessment of the impact of financial variables on the real economy more complex. A further factor is the different financial structure between Europe and other non-EU countries. Europe is characterised by a predominance of the bank-based model, where banks play a primary role in financing companies and

households, although there are differences between countries with a more bank-based system (such as Germany and France) and others where financial markets have a greater weight (Saunders et al., 2022; Mishkin & Eakins, 2018; Behr & Schmidt, 2015; 2017; Bertero, 1994; Lepetit et al., 2017; Hüfner, 2010; Hoggarth et al., 2001; Beck et al., 2009; Beck & Levine, 2002). In non-European countries, and particularly in the United States, corporate financing is predominantly through the capital market, with a strong incidence of institutional investors and venture capital. This divergence in financial models risks introducing methodological bias into the analysis. Furthermore, Europe has a relatively uniform socio-economic model, characterised by a high level of social protection and income redistribution policies. Unlike other contexts, such as the United States, where inequality is strongly influenced by market dynamics and less regulation of the financial sector, Europe offers a more stable institutional framework, with welfare state systems that mitigate the redistributive effects of the financial sector. Finally, the choice to focus on Europe is also politically and economically motivated. In recent years, the European financial sector has undergone significant transformations, including the implementation of the European Banking Union, the strengthening of prudential regulations and the expansion of capital markets. The following analysis, therefore, provides useful insights for European economic policies and future reforms aimed at improving access to finance and reducing economic disparities (Beck & Levine, 2002; Beck et al., 2009; Boot & Thakor, 2008; Demirgüç-Kunt & Levine, 2001; Rajan & Zingales, 2003; Levine, 2002; Hoggarth et al., 2001; Guinnane, 2002; Hardie & Howarth, 2009)

The rest of the chapter is divided into eight main sections. Section 1.1 introduces the topic and outlines the evolution of financial models, comparing market-based and bank-based systems. Section 1.2 reconstructs the birth and architecture of the European Banking Union, examining its three pillars (SSM, SRM and EDIS) and the critical issues related to its completion. Section 1.3 analyses the expansion of shadow banking in Europe, highlighting its definitions, growth drivers and systemic vulnerabilities. Section 1.4 discusses the structural role of SMEs in the European economy and the difficulties of accessing credit, including the main policy responses

at EU and national level. Section 1.5 presents the evolution of sustainable finance in the European financial system, with a focus on the regulatory framework (EU Taxonomy, SFDR, Green Bond Standard) and the implications for banks and markets. Finally, Sections 1.6–1.8 explore the effects of financial development on the real economy, respectively in terms of employment dynamics, economic growth and income inequality, linking theoretical evidence, transmission channels and policy implications.

1.2 European Banking Union

Within the European Union, the European Banking Union was created. It was created as the financial crisis of 2007-2008 and the sovereign debt crisis of 2012 highlighted the need for a new project aimed at creating greater banking cohesion and union among the EU Member States and at the same time eliminating the economic divide and differences between them (Breuss, 2013).

It is well known that the sovereign debt crisis had led in its first phase to an increase in the spread of the government bonds of the PIIGS countries (Portugal, Ireland, Italy, Greece, Spain) over similar German bonds, and that the economic policies that followed to mitigate this effect were not effective. The most immediate consequence was the contagion of the real crisis among all EU countries (and beyond), with many companies closing down and unemployment rates rising. The conditions for the reaffirmation of national identities became evident among the member states, and many states hoped for a possible return of national currencies to overcome the difficulties brought about by the crisis (Council of the European Union, 2024). Italy, Spain, Ireland, Portugal, Cyprus and Greece were hardest hit by the crisis, while some northern European countries such as Germany, which had been less affected by the crisis, wanted to avoid the “risk of contagion” (Howarth & Quaglia, 2016).

Thus arose the need to create greater integration between the states in order to achieve a political union that had so far not taken place, arousing the discontent and disappointment of many member states. There was a need to create cohesion between the member states in such a way that they felt that events beyond national borders were their own and that common interests were pursued as a priority.

What was needed, therefore, was a shift in the EU agenda so as to redefine the priorities to be pursued and to implement more concerted and coherent actions within the eurozone (Breuss, 2013; Council of the European Union, 2024).

In response to these critical issues, the European institutions launched the Banking Union project in 2012, with the declared aim of strengthening financial stability and completing the single market for banking and financial services.

The Commission's proposal for a banking union among EU Member States, with a view to greater integration and cohesion among them, had an impact on the specific competences of the bodies that make up the ESFS (European System of Financial Supervision) (Pisani-Ferry et al., 2012).

Currently, the architecture of the European financial system consists of three supervisory authorities:

(i) EBA (European Banking Authority) which regulates the banking sector

(ii) ESMA (European Securities and Markets Authority) which regulates financial markets and instruments

(iii) EIOPA (European Insurance and Occupational Pensions Authority) which regulates insurance and pension markets.

The European Systematic Risk Board (ESRB) is another organization that oversees macroprudential matters.

Together with the national supervisory authorities and the ECB, the three authorities and the ESRB make up the ESFS, which must ensure compliance with the rules in financial supervision to ensure the latter's stability (Castañedaet al., 2015).

The aforementioned structure stems from the 2010 reform as, following the financial crisis of 2007 and 2008, flaws in the nationally based financial supervisory model emerged due to the increased integration and interconnectedness of markets.

The European supervisory systems were reformed in order to:

(i) address the weak recovery

(ii) restore appropriate and efficient conditions in the economy

(iii) restore confidence among stakeholders

(iv) realise the Banking Union project through which a single supervisory mechanism and a single resolution mechanism could be achieved

The Banking Union has three main pillars: the Single Supervisory Mechanism (SSM), the Single Resolution Mechanism (SRM) and the European Deposit Insurance Scheme (EDIS). Each of these instruments responds to a specific functional need within the framework of European banking regulation and supervision, but the implementation process has encountered significant political resistance and divergences between Member States over time, which have so far prevented the full completion of the Banking Union (Moloney, 2014).

The first pillar of the Banking Union, the Single Supervisory Mechanism (SSM), has been operational since November 2014 and is, without doubt, the most accomplished and coherent outcome of the project. The SSM operates compulsorily in the 19 Eurozone countries, while the other EU Member States can join it on a voluntary basis. In this case, the operating rules are laid down in Regulation (EU) No 1024/2013, which, for countries that join but are not in the Eurozone, normally provides for a minimum level of cooperation, unless a specific request is made by the country to enter into a closer cooperation regime with the ECB, the same as for Eurozone countries. Supervised entities have been divided into the two broad categories of "significant institutions" and "less significant institutions", according to the MVU The supervision of the less significant institutions is entrusted to the national authorities of each Member State, while the supervision of the more significant ones is carried out directly by the ECB. The criteria for determining whether banks fall under the direct supervision of the ECB relate to the size of the bank (total assets greater than EUR 30 billion), its importance to the EU economy, as well as to the economy of the Member State (total assets greater than EUR 5 billion and 20% of a Member State's GDP), and the extent of its cross-border activities (greater than 20% of total assets and liabilities). Prudential supervision applies to banks or, more precisely, to "credit institutions", which are defined as undertakings whose business is to "take deposits or other repayable funds from the

public and grant credits for their own account". Institutions that national laws may define as "banks" even though they do not receive deposits are therefore excluded from the prudential supervision of the MVU, as they do not qualify as banks under EU law. The introduction of centralised banking supervision has made it possible to standardise supervisory methodologies, strengthen the prevention of systemic risks and improve transparency and comparability between different national realities. However, there was no shortage of interpretation problems and conflicts of competence, especially in the start-up phase, related to the different legal and regulatory traditions of the member states (Breuss, 2013; Council of the European Union, 2024).

The second pillar, the Single Resolution Mechanism (SRM), was established with the task of managing banking crises in an orderly manner, limiting the use of public funds to a minimum and ensuring the continuity of essential banking services. Active since January 2016, the SRM is based on a multi-faceted governance, in which the Single Resolution Board (SRB), a central authority based in Brussels, cooperates with the national resolution authorities and the ECB. In the event of the failure of a significant or cross-border bank, the SRB defines and implements the resolution plan, using tools such as bail-in, asset sales or the creation of a bridge bank. To finance these interventions, the Single Resolution Fund (SRF), a mutual fund fed by contributions from European banks, was established, which by 2023 had reached an endowment of more than EUR 77 billion. Despite progress, the SRM has been criticised for procedural complexity and operational uncertainties in the event of systemic crises, also due to the fragmentation of national bankruptcy laws (Baglioni, 2016).

While the first two pillars have been substantially implemented, albeit with some operational criticalities, the third one - the European Deposit Insurance Scheme (EDIS) - represents the real missing link in the Banking Union and the main source of political tension between member countries. In November 2015, the European Commission proposed to set up a European Deposit Insurance Scheme (EDIS European Deposit Insurance Scheme) for bank deposits in the euro area. EDIS has not been established to date. It will be based on the set of national Deposit Guarantee

Schemes (DGS) regulated by Directive 2014/49/EU (Deposit Guarantee Schemes Directive) and a European Deposit Insurance Fund (EDIF European Deposit Insurance Fund). The EDIS will provide a stronger and more uniform degree of insurance coverage in the euro area in order to reduce the vulnerability of national DGSs to major shocks, ensuring that the level of depositors' confidence in a bank does not depend on the bank's location and weakening the link between banks and their national sovereigns. The EDIS should apply to deposits below EUR 100,000 of all banks in the European Banking Union. When one of these banks goes into liquidation or resolution and it is necessary to repay the deposits or finance their transfer to another bank, the national DGS and EDIS will step in (Elliott, 2012).

The EDIS establishment program should be developed in three different phases:

1. Reinsurance: EDIS should provide a specific amount of liquidity assistance and absorb a specific amount of the final loss of the national DGS in the event of reimbursement or resolution.
2. Co-insurance: it should not be necessary to exhaust the national DGS before accessing the EDIS. At this stage, it should absorb a progressively larger share of losses in the event of repayment or resolution, while national and European DGSs would co-finance the intervention.
3. Full insurance: the EDIS will completely replace national DGSs, becoming the sole deposit insurance system for banks in the euro area.

Pending the establishment of EDIS, the set of national deposit guarantee schemes (DGSs) regulated by Directive 2014/49/EU (DGS Directive) ensures that all deposits up to €100,000 are protected by national DGSs throughout the EU (Macchiarelli, 2018).

Resistance to the full implementation of EDIS is based on two reasons. On the one hand, there is a divergence of views on the principle of mutualisation of risks: creditor countries demand that, before any step towards a common guarantee, the reduction of existing risks in banks' balance sheets be completed, in particular as regards the level of non-performing loans (NPLs) and exposure to domestic sovereign debt. On the other hand, there are political and electoral reasons, as in

several Member States the prospect of participating in a common guarantee fund is perceived as a potential financial burden on national taxpayers (Breuss, 2013; Council of the European Union, 2024).

On top of that, there are some technical criticalities. The presence of national banking systems that are still heterogeneous in structure, size and degree of concentration leads to difficulties in defining uniform contribution and cost-sharing criteria. Moreover, the management of small banking crises, which would remain outside the direct supervision of the ECB, could generate asymmetric situations and complicate coordination between national and European levels (Boccuzzi, 2016).

Despite the difficulties, the completion of the EDIS remains a prerequisite for the full credibility and stability of the Banking Union. The absence of a common deposit guarantee, in fact, fuels the risk of financial fragmentation in the presence of systemic shocks, as savers could transfer their funds to banking systems perceived as safer, generating imbalances and tensions in national financial markets. In this sense, numerous institutional reports, including those of the European Commission, the ECB and the ESRB, have reiterated the urgency of overcoming political impasses and proceeding to a gradual implementation of EDIS, possibly through an intermediate phase of reinsurance of national systems before full mutualization (Constâncio, 2012).

In conclusion, the Banking Union has been one of the most ambitious institutional interventions in the history of European economic and financial integration, making it possible to strengthen the resilience of the banking system and reduce the link between banking crises and national public finances. However, its structural incompleteness, linked to the failure to complete the third pillar, continues to represent a significant vulnerability for the euro area. Only a full integration of supervisory, resolution and deposit insurance functions will ensure lasting financial stability and enable the eurozone to face future financial crises with greater cohesion (Howarth & Quaglia, 2014).

1.3 Shadow Banking

Over the past fifteen years, the European and global financial system has undergone profound transformations, fostered by the convergence of financial innovation, progressive capital market integration and regulatory changes following the 2008 global financial crisis. In this context, there has been a significant growth of non-bank financial intermediaries, i.e. those entities that perform typical credit and financial intermediation functions while remaining outside the traditional banking perimeter and, consequently, subject to less stringent regulation.

The term shadow banking was first used in 2007 by economist Paul McCulley in a speech at the symposium that the Federal Reserve organises every year in Jackson Hole, referring to the development of new forms of financial intermediation outside the banking system. He referred to the development of new forms of financial intermediation outside the banking system. The reference was to "unregulated shadow banks", which, instead of using the typical forms of financing typical of the banking business (e.g. savers' deposits or even liquidity provided by the respective central bank), operated with market-based instruments, thereby exposing themselves - and the financial system as a whole - to the liquidity risk that typically characterises financial markets in times of crisis. A debate ensued, among regulators and in academia

With the term shadow banking, the Financial Stability Board (FSB) in 2011 referred to a heterogeneous set of activities and institutions that operate in parallel to the banking system, but do not benefit from the guarantees offered by protected deposit-taking or direct access to emergency liquidity provided by central banks. The broader European definition includes investment funds, insurance companies, pension funds, fintech platforms, securitisation vehicles and other entities that, while performing capital allocation and liquidity transformation functions, are subject to a fragmented sectoral supervisory regime.

In the aftermath of the great financial crisis, the role of these intermediaries has become increasingly important in the financing of the real economy, boosted by a twofold dynamic. On the one hand, the strengthening of prudential rules for banks,

through the introduction of Basel III and the European directives CRD IV and CRR, which have limited banks' ability to take risks and increase their level of leverage. On the other, the prolonged phase of near-zero interest rates led institutional investors to seek higher returns through alternative and less regulated instruments. In this scenario, non-banking intermediaries offered a flexible and efficient response to the new market needs, placing themselves in riskier and less transparent segments of the financial system (Shakdwipee & Mehta, 2017).

The differences with respect to the traditional banking system are evident in several respects. Banks, strictly regulated in terms of both capital and liquidity, enjoy institutional privileges such as the collection of guaranteed deposits and direct access to central banks' emergency lines. Non-bank intermediaries, on the other hand, cannot benefit from such guarantees and are mainly financed through securities issues, loans from institutional investors or contributions from savers, with a generally less transparent capital structure and maturity transformation. Moreover, the level of leverage, although formally lower, can be high if one considers the implicit leverage resulting from the use of derivative instruments or securitisation structures (Bencivenga & Smith,1992).

Despite their positive contribution to the diversification of funding sources, non-bank intermediaries have characteristics that make them potential amplifiers of systemic risk. Liquidity transformation is one of them: investment funds and digital lending platforms often offer more liquidity than the underlying assets, creating the risk of redemption races in situations of financial turbulence. In addition, there are risks of interconnectedness with the traditional banking system: many non-bank intermediaries have bilateral relationships with banks through credit lines, derivative transactions and cross-shareholdings, constituting potential channels of risk transmission (Bond, 2004).

A confirmation of these vulnerabilities came during the acute phases of the Covid-19 pandemic. In March 2020, the sudden collapse of financial markets led to a run on liquidity that also involved money funds and shadow banking entities, forcing monetary and supervisory authorities to take extraordinary measures to stabilise the

system. The report published by the European Systemic Risk Board (ESRB) in 2021 pointed out that investment funds with investment strategies on illiquid assets experienced substantial outflows, exacerbating market tensions.

At the same time, the expansion of non-bank intermediaries was favored by a number of underlying trends that were consolidated in the post-2008 period. Firstly, the extremely low-interest rate environment increased the demand for yield from institutional investors, such as pension funds and insurance companies, pushing them towards riskier asset classes and alternative instruments. Second, technological innovation has led to the emergence of new digital platforms for investment management and lending, which have further eroded market share from traditional banking institutions. Finally, the increasing integration of European capital markets, promoted by EU institutions through the Capital Markets Union (CMU) project, has helped to stimulate the use of alternative funding channels (European Commission, 2015).

At the international level, the FSB uses three "aggregates" to measure the size of the shadow banking system:

(i) the set of non-financial intermediaries (so-called MUNFI, consisting of insurance companies, pension funds, other financial intermediaries - so-called OFIs -, financial auxiliaries).
(ii) the subset (of the MUNFI) consisting of OFIs, which defines the "broad measure of shadow banking".
(iii) the subset (of the MUNFI and OFIs) made up of those non-banking financial entities that, according to the classification adopted by the Organism, characterise the 'narrow measure of shadow banking'.

Starting from the balance sheet data of the component entities of each aggregate in 29 countries - corresponding to around 80% of global wealth (in terms of Gross Domestic Product, GDP) - the FSB's latest report, published in March 2018, indicates that the size at the end of 2016 of the set of non-financial intermediaries is $160 trillion, and that $99 trillion and $45 trillion are, respectively, the "enlarged" and "narrow" measures of shadow banking.

At the European level, the European Systemic Risk Board (ESRB) uses an 'enlarged' measure - comparable with the similar measure adopted by the FSB - and in its latest report, published in September 2018, indicates the size at the end of 2017 of the shadow banking system in the EU and the Eurozone as €42.3 trillion and €33.8 trillion, respectively.

In the face of these developments, the European regulatory framework has gradually adapted, albeit less uniformly than in the banking sector. The main body in charge of macro-prudential supervision of non-banking intermediaries is the ESRB, set up in 2010, which has repeatedly recommended stronger supervision of liquidity management in investment funds and greater transparency in implicit leverage transactions. On a sectoral level, the European Securities and Markets Authority (ESMA) introduced specific guidelines for monitoring liquidity risks and reporting on derivatives, while the European Insurance and Occupational Pensions Authority (EIOPA) intensified its supervision of financial and sustainability risks for insurance and pension funds.

Particularly relevant in recent years have been the regulations adopted at EU level to regulate specific areas of the non-banking sector. The Money Market Funds Regulation of 2017 imposed stricter constraints in terms of liquidity and transparency, while the Sustainable Finance Disclosure Regulation (SFDR) of 2019 introduced reporting requirements on the sustainability of investments, extended also to alternative funds and private equity vehicles. At the policy level, the Capital Markets Union project, launched in 2015 and still being implemented, aims to foster greater regulatory harmonisation and strengthen cross-border supervision of non-bank intermediaries to mitigate regulatory arbitrage risks and systemic vulnerabilities.

With regard to the (well-known) shadow banking risks considered to be at the origin of the 2007-2008 crisis, the FSB states that these risks can be considered as no longer significant as of today. On the other hand, - the FSB's latest report highlights - the "narrow" measure of the shadow banking system presents a strong degree of concentration, in terms of both types of financial actors and countries:

(i) as regards the first aspect, 72% of the measure is made up of Collective Investment Vehicles (investment funds, credit hedge funds, money market funds) exposed above all to liquidity and maturity transformation risks;

(ii) with reference to the second aspect, 75% of the measure is explained by 7 countries (among the 29 countries included in the scope of analysis); in particular: the United States is the country that contributes the most to the shadow banking system (with $14.1 trillion); followed by China (with $7 trillion), the Kayman Islands (with $4.7 trillion), Luxembourg ($3.2 trillion) and Japan (with $2.8 trillion); interestingly, Italy is the leader, with a contribution that is essentially zero.

Among the systemic risks, the risk of interconnectedness between the assets and liabilities of different non-banks (between OFIs and banks; between OFIs, insurance companies and pension funds); and the high degree of leverage of financial firms in some countries is of particular concern. Similar risks have been identified at European level by the ESRB (of liquidity; of leverage for investment funds; of interconnectedness and contagion between financial sectors). In addition, the continued and (ever) widespread use of financial derivatives contributes to contagion risk, and fuels procyclicality, leverage and liquidity risks.

In the global economy, (also) due to the role assumed by the shadow banking system, finance continues to dominate the real economy. The value of global financial assets (measured by the FSB at $340 trillion at the end of 2016) is equivalent to about 5 times global wealth (in terms of GDP); and the phenomenon of banking disintermediation - which characterises this historical phase, brought about by the downsizing of the role of the banking enterprise and the emergence of new credit intermediaries that fall within the aggregates of the shadow banking system - is attested by a volume of assets realised by non-banks (which is, moreover, continuously increasing) that has surpassed that of banks (by $137.8 trillion, at the end of 2016). Given the highly dynamic nature of the shadow banking system, ‘the importance of continued monitoring to mitigate associated risks and support the transformation of these activities into resilient market-based finance’ is emphasized (Medina, 2018; Schneider & Enste, 2000).

Among the new risks of a systemic nature arising from shadow banking, those that can be generated by the fintech sector are declared relevant - on a global, European and national level.

To grasp the meaning of this - among the possible applications of Fintech - one thinks of algorithmic trading in financial markets, in particular the spread of "high-frequency" trading, which accounts for more than 50 per cent of the total volume of trades concluded in the North American stock market. High-frequency systems can send even more than 5,000 trading orders to trading platforms in one second. The orders take the form of "impulses": the fastest trade made on the Nasdaq index took place in 100 microseconds (0.1 milliseconds, a lapse of time imperceptible to human beings); and to further "increase" the speed of trading, the exploitation of laser beams in place of fibre-optic cables is being studied. While most of the academic literature agrees in identifying the main advantages of this type of trading (increase in liquidity available to market participants; decrease in transaction costs; increase in price information efficiency; increase in inter-market linkages), some of the high-frequency trading strategies can be used in a "perverse" manner as also witnessed by recent flash crashes observed in the financial markets. This is a technical, worrying and challenging phenomenon for supervisory authorities (Jones, 2013).

In conclusion, non-bank financial intermediaries are a structural and increasingly important component of the European financial system. They amplify certain systemic vulnerabilities that require coordinated macro-prudential supervision based on up-to-date and granular data. The regulatory process initiated by the EU in recent years has made significant progress, although there remain areas of concern related to regulatory fragmentation and the ability of authorities to detect emerging risks at an early stage.

1.4 SMEs and Access to Credit

In the European economic context, small and medium-sized enterprises (SMEs) represent a structural component of primary importance, constituting over 99% of the productive fabric and ensuring approximately two-thirds of jobs in the private sector. Despite their crucial role, SMEs continue to encounter significant difficulties

in accessing credit, both from banks and from the market, compared to larger companies. These critical issues have become more acute following the global financial crisis of 2008 and the subsequent sovereign debt crisis, which led to a tightening of credit granting criteria and a general contraction of banking supply, especially in southern European countries (Andrieș et al., 2018).

While it is true that the problem of access to credit for SMEs is common to all advanced economies, it takes on peculiar characteristics in Europe due to the strong dependence of business financing on the banking channel. Unlike in the United States, where the use of capital markets and alternative finance instruments is more widespread even among medium-sized enterprises, in the European Union, and even more so in the euro area, bank credit has traditionally been the main source of external financing for SMEs. This financial structure has made the European production system particularly vulnerable in phases of credit restriction, contributing to slowing down the post-crisis economic recovery (Berger & Udell, 2006). The critical issues of access to credit manifest themselves in different forms among European countries, reflecting structural divergences in financial systems, in the solidity of banks and in the quality of the entrepreneurial fabric. In particular, a clear distinction can be observed between the so-called core countries - such as Germany and France - and those on the periphery of the eurozone, such as Spain and Greece. In the countries of Central Europe, SMEs have historically benefited from a greater solidity of the banking system, lower interest rates and a better availability of subsidized finance instruments. Furthermore, in Germany the model of relational banking and territorial credit institutions, such as Sparkassen and Landesbanken, has fostered a long-term relationship between banks and SMEs, helping to mitigate credit restrictions even in times of crisis (Behr & Schmidt, 2015, 2017).

On the contrary, in the countries of the European periphery, SMEs have suffered more significantly from the consequences of the credit crunch after 2008. In Spain and Greece, the deterioration of the quality of bank assets, the high level of non-performing loans (NPLs) and the financial difficulties of credit institutions have led to a drastic reduction in the supply of credit to businesses, accentuated by more

onerous interest rate conditions and requests for real guarantees that are often disproportionate to the capital capacity of SMEs. Furthermore, the poor integration of capital markets and the limited financial culture of smaller businesses have hindered the use of alternative sources of financing, amplifying the disparities between the different areas of the eurozone (Kuntchev et al., 2013).

The European Union and individual Member States have sought to respond to these critical issues through a combination of structural and cyclical policy interventions. At the Community level, the COSME (Competitiveness of Enterprises and Small and Medium-sized Enterprises) program and the Juncker Plan have represented two key initiatives to promote access to credit and investment for SMEs. The COSME program, through guarantee and co-financing instruments, has made it possible to mobilize bank financing for small businesses at high risk or without adequate guarantees. The European Fund for Strategic Investments (EFSI), envisaged by the Juncker Plan, has instead supported infrastructure projects and productive investments, offering guarantees and risk-sharing instruments to attract private capital.

More recently, the Capital Markets Union (CMU) project aims to reduce the dependence of European businesses on bank credit, developing more integrated and accessible capital markets also for SMEs. The measures envisaged include the simplification of procedures for accessing bond and equity markets for small businesses, the introduction of simplified disclosure standards and the promotion of alternative finance tools such as crowdfunding and digital lending platforms (European Commission, 2015).

At the national level, several Member States have implemented specific policies to support credit to SMEs. In Germany, in addition to the Sparkassen model, the role of the public development bank KfW has been crucial in offering subsidized financing and guarantees to small businesses. In France, the public guarantee system managed by Bpifrance has helped stabilize the flow of credit to SMEs, especially during recessions. In Italy, the Central Guarantee Fund for SMEs has played a crucial role in facilitating access to bank credit, covering a significant share of the

guarantees requested by credit institutions and reducing the risk perceived by banks. However, the Italian system continues to suffer from excessive fragmentation and a productive fabric characterized by poorly capitalized micro-enterprises, which struggle to access both bank credit and the capital market (Behr & Schmidt, 2015, 2017; Bertero, 1994; Lepetit et al., 2017; Saunders et al., 2022).

Greece has also launched initiatives to support credit to SMEs through public guarantee funds and instruments co-financed by European structural funds, despite a context made extremely difficult by the long period of financial crisis and the banking restrictions imposed by international assistance programs.

In summary, European SMEs continue to be penalised by a heterogeneous financial structure and credit access conditions, which reflect the asymmetries between national banking systems and the different levels of development of capital markets. Although EU policies have helped to alleviate the difficulties, the issue of full European financial integration remains unresolved, a necessary condition to guarantee equal financing conditions for companies regardless of their country of origin. In this sense, the completion of the Capital Markets Union and the strengthening of European guarantee and financing instruments dedicated to SMEs represent strategic priorities for the future of the European economy (Andrieș et al., 2018; Berger & Udell, 2006; European Commission, 2015; Kuntchev et al., 2013).

1.5 Sustainable Finance in the European Financial System

In recent years, sustainable finance has gone from being a niche area, mainly confined to ethical investors and specialized environmental projects, to becoming a cornerstone of the European Union's economic and financial development strategies. Gradual consolidation of awareness about systemic risks arising from climate change, pressure from institutional investors, and increasing social focus on environmental, social and governance (ESG) responsibility criteria have redefined European financial policy priorities. This has been accompanied by the urgency of directing private capital toward the green and digital transition, which has been recognized as imperative for both long-term environmental goals and economic stability in the area (EU Regulation 2020/852).

The regulatory shift imparted by European institutions had its turning point with the Sustainable Finance Action Plan, adopted by the European Commission in 2018, which laid the foundations for a coherent and harmonized regulatory framework aimed at integrating environmental, social and governance considerations into the decision-making processes of financial and corporate actors. Three legislative instruments, in particular, redefined the regulatory perimeter of sustainable finance in Europe: the Green Bond Standard, the Sustainable Finance Disclosure Regulation (SFDR), and the EU Taxonomy.

Green Bond Standard EU GBS or European Green Bond Standard is the regulatory vehicle represented by Regulation (EU) 2023/2631, which defines the voluntary standard developed by the European Commission to promote the development of a more transparent and resilient Green Bond and Sustainability Bond market in Europe and more focused on directing investments towards technologies and projects that can support the energy, ecological and industrial transition, thus contributing to the objectives of the European Green Deal. They thus concern projects that can foreground energy production from renewable sources, the sustainable use of resources, or energy efficiency more generally, but can also come to cover waste or water treatment, pollution control or abatement, "green" transport or infrastructure interventions, and green building. They were first theorized by Italian Aldo Romani, who today heads the Sustainability Funding of the European Investment Bank (EIB), while the first issue dates back to July 4, 2007, by the EIB itself. Looking at Italy, the first green bond was launched in 2014 by Hera, a multi-utility in Emilia, a 10-year €500 million bond. The special features are:

1. the type of project to be financed must be oriented toward environmental sustainability,
2. the proceeds of the issue must be invested exclusively for the implementation of these initiatives, with specific target accounts that are restricted or with portfolios that can be monitored by the issuer. For this, beneficiaries must produce, at least annually, an accounting of the use of the funds obtained, which must also be subject to certification by an external auditor.

Alongside this we have the Sustainable Finance Disclosure Regulation (SFDR). It is an EU regulation that aims to ensure or increase the transparency of disclosures related to the sustainability of financial products so that investors of all types, professional and private, can have reliable data and information and make informed investment decisions. The SFDR came into force, as mentioned above, on March 10, 2021, and was immediately an important step in building sustainable finance at the EU-area level. The regulation, in synergy with other European regulations, aims to create the conditions for growing the flow of capital into green and sustainable investments. The more ambitious goal then is to grow a financial model that supports a more planet-conscious economy, with a constant call toward players to integrate ESG factors into strategic investment decisions and performance monitoring (Jeucken, 2010). The actors primarily involved belong to three broad types:

- Financial market participants, namely asset management firms, investment banks, lending institutions and organizations that provide portfolio management services, financial advisors and pension funds.
- Firms that offer financial products, including entities that issue bonds, stocks, and other financial instruments.
- The realities that are or could be the subject of sustainable investments. From this perspective, these are many different types of companies, which may include, for example, companies operating in the areas of clean energy, energy efficiency, environmental protection, corporate social responsibility and governance, but also so-called CleanTech.

The Sustainable Finance Disclosure Regulation applies to a wide range of financial products that can be classified according to the type of strategy and relationship to sustainability issues (Fedorowicz & Zalcewicz, 2024). In general, the SFDR affects all categories of investments, which-in relation to their relationship with sustainability issues-can be divided into three broad categories:

- Sustainable funds: which include all those investment funds with clear and explicit ESG objectives

- Funds that pay significant attention and consideration to sustainability issues. That is, funds in which are included investments in different types of assets that are not necessarily ESG-driven, but in their management choose to make investment decisions guided by sustainability factors
- Non-sustainable funds and thus those funds that do not set sustainable investment goals and do not consider sustainability factors in their management strategies.

A pivotal element of this new regulatory infrastructure is the EU Taxonomy, a technical classification system designed to establish objective and scientific criteria for defining which economic activities can be considered environmentally sustainable (Ahlström & Monciardini, 2022). The European Taxonomy, adopted in 2020, governs six priority environmental goals-from climate change mitigation and adaptation to biodiversity protection-and requires companies and financial players to report the percentage of activities and investments aligned with these goals. Its gradual implementation is a crucial step not only to steer financial flows toward the green transition, but also to limit the increasingly common phenomenon of undue attribution of green labels to financial products with no real environmental content (Ziolo et al., 2021).

In parallel with the establishment of the regulatory framework, there has been a gradual integration of ESG criteria into the management of bank balance sheets and market structure. European banks, in response to both regulatory pressures and requests from institutional investors, have begun to incorporate environmental and social metrics into their credit and operational risk assessment models. The European Central Bank, through its Guide on Climate-related and Environmental Risks published in 2020, clarified the requirement for significant banks to identify, assess, and manage climate and environmental risks by integrating them into governance, risk management, and disclosure processes (Cavallito et al., 2017).

This development is leading to a gradual rebalancing of the credit and investment portfolios of banking institutions, with increasing selectivity toward companies and projects that are compatible with environmental and social objectives. The same

logic is extending to the capital market, where demand for ESG-compliant instruments has increased exponentially, incentivizing companies to improve their sustainability profiles to access more favorable financing terms (Busch et al., 2024).

The effects of this transformation are also reflected in the risk structure and diversification of financing in the European financial system. Indeed, the integration of ESG factors contributes to a better allocation of capital, penalizing sectors and activities with high environmental and social impacts and instead rewarding projects that are consistent with the European Union's long-term strategies, particularly the European Green Deal and the 2050 climate neutrality target. Looking forward, greater attention to climate and governance risks makes it possible to reduce the likelihood of sudden shocks to financial markets related to extreme environmental events or reputational crises, improving system resilience in the long run (Driessen, 2024).

In addition to traditional bank loans, the ability to issue green bonds, social bonds or sustainability-linked loans allows a wider range of entities to access dedicated capital on competitive terms. This is particularly relevant for southern European countries, which have historically suffered from more onerous access to credit, and which, thanks to the spread of ESG instruments, can expand their sources of financing and strengthen their investment capacity (Moneva et al., 2023).

In Europe, there is a clear distinction between Northern European countries and Southern European countries. In countries such as Germany (In 2023, the German banking sector increased green loans by over 30% compared to 2021, according to ECB data.), the Netherlands and Scandinavia (over 60% of banks in these countries already apply ESG criteria when granting loans today, compared to an EU average of less than 40%), banks have long shown a strong propensity to finance companies committed to environmental sustainability. This orientation derives from a combination of factors: on the one hand, the presence of a corporate and financial culture that is more sensitive to ESG issues; on the other, an advanced regulatory context that fiscally or regulatory rewards green companies and incentivizes banks to include environmental criteria when granting credit. The main German and Dutch

banks, for example, have for years had lines of credit dedicated to companies that respect certain environmental standards, while cooperative and territorial banks play an active role in financing renewable energy and environmental redevelopment projects (Behr & Schmidt, 2015, 2017). The situation is different in Mediterranean European countries, such as Italy, Spain and Greece, where, although there has been growing attention to the issue in recent years, financing for green companies remains more limited and concentrated in the larger company sizes. Italian banks, for example, have only recently begun to develop ESG-linked credit lines or green bonds dedicated to SMEs, while large banking groups have mainly focused on corporate customers and infrastructure financing. One of the causes of this difference lies in the fragmented production structure and lower capitalization of companies, which makes it more difficult for SMEs to sustain the costs of complying with environmental regulations and obtaining recognized ESG certifications. The differences become even more marked if we look at the comparison between European and non-European countries. In the United States, the banking sector has moved strongly towards ESG issues in the last five years, driven partly by regulatory pressure and partly by the growing demand for sustainable investments by institutional investors. However, the US system remains strongly market-based, and the role of traditional banks in directly financing green companies is more limited than that of investment funds and specialized private equity firms (Saunders et al., 2022; Mishkin & Eakins, 2018; Bertero, 1994; Lepetit et al., 2017).

Finally, in emerging countries, the situation is even more diverse. In some Asian economies such as China and South Korea, the financing of green projects has been strongly encouraged by government authorities, which have required state-owned and private banks to allocate an increasing share of credit to low-impact and renewable energy projects. China, in particular, has become the world's leading market for green bond issuance and has launched an ambitious reform of the banking sector aimed at integrating environmental risks into credit models. However, in other emerging countries - particularly in sub-Saharan Africa and in some Latin American economies - green finance remains marginal, limited to a few

microfinance initiatives and pilot projects promoted by multilateral bodies (Jeucken, 2010).

Thus, sustainable finance has assumed a strategic role in the European financial system, gradually transforming from a voluntary option to a structural component of public policies and financial intermediaries' strategies. The new regulatory framework, although still in the consolidation phase, has already produced tangible effects on operators' behavior and capital allocation dynamics. However, it remains crucial to ensure full implementation of the regulations and effective coordination between European and national authorities to avoid fragmentation and competitive distortions. Only in this way can sustainable finance make a stable contribution to inclusive growth and financial stability in the European Union.

1.6 Financial Development and Employment Dynamics

In contemporary economic studies, the concept of financial development is considered multidimensional and is measured through different categories of indicators, each capable of capturing specific aspects of the structure and performance of the financial system (Beck et al., 2007). The most authoritative literature distinguishes four main dimensions of financial development: **Financial Depth**, which measures the aggregate size of credit and market capitalization relative to GDP; **Financial Access**, an indicator of the ability of businesses and citizens to obtain credit and use financial instruments; **Financial Efficiency**, which assesses the effectiveness of the intermediate system in allocating resources and capital; and finally, **Financial Stability**, referring to the system's ability to absorb shocks without compromising the continuity of financial flows (Levine, 2005). These four dimensions, measured through a variety of standardized indicators, allow us to analyze not only the absolute level of financial development but also its effects on the real economy, including employment.

Table 1.1. Classification of Financial Development indicators

FINANCIAL DEVELOPMENT DIMENSIONS	MEASURES
Financial Depth	1. Credit to private sector / GDP 2. Stock market capitalization / GDP 3. Total banking assets / GDP 4. total assets of NBFIs (non banks financial institutions) /GDP 5. private debt securities / GDP
Financial Access	1. Number of bank branches / 100.000 adult population 2. Number of bank branches / 1.000 Km^2 3. Number of ATMs / 100.000 adult population 4. Number of ATMs / 1.000 Km^2
Financial Efficiency	1. Net interest margin (NIM) 2. Cost-to-income ratio 3. Cost efficiency
Financial Stability	1. Capital adequacy ratio (CAR) 2. Non-performing loans / total loans (NPL ratio) 3. Z-score bancario 4. Return on equity 5. Non-interest expenses / Gross income 6. Liquid assets / Total assets

Source: Personal elaboration based on World Bank (Global Financial Development Database); Beck, Demirgüç-Kunt & Levine (2007); Levine (2005); IMF (Financial Soundness Indicators).

In this context the relationship between financial development and employment dynamics represents one of the most widely discussed issues in contemporary economic literature (Levine, 2005; Stiglitz, 2012), both in theoretical and empirical circles. Since the classical tradition, the financial system has been considered one of the key hubs for economic growth (Schumpeter, 1911), due to its ability to allocate resources, facilitate productive investment and support innovation. However, the nexus between financial development and employment is more complex and nonlinear, as it depends on the structure of financial markets, the quality of institutions and the ability of public policies to direct capital to employment-intensive sectors (Beck et al., 2001).

During economic crises, the role of the financial system in sustaining employment proves particularly delicate. The global crisis of 2008 showed how the blockage of bank credit and the contraction of investment had devastating effects on

employment, especially in countries with a high dependence on bank credit and less developed financial markets (Cecchetti & Kharroubi, 2012). At that time, small and medium-sized enterprises, which are most exposed to the risk of credit restriction, suffered the most, with significant effects on youth employment and precarious workers (Beck et al., 2007). Even during the pandemic crisis of 2020, albeit in a different context, restrictions on mobility and a collapse in demand led to a rapid increase in unemployment, once again highlighting the crucial role of credit and financial instruments in the resilience of employment systems.

Empirically, there is evidence that the degree of a country's financial development directly affects labor market dynamics (Levine, 2005; Demirgüç-Kunt & Levine, 2001). In particular, there is evidence that greater access to credit by firms facilitates the job placement of young people, who have traditionally been penalized in terms of employment opportunities and stability (Beck et al., 2007). Where the financial system can support new businesses and finance innovative business projects, lower levels of youth unemployment and greater social mobility are observed (Andrieș et al., 2018). Conversely, in contexts where credit is focused on large firms or traditional sectors, opportunities for younger groups and start-ups remain limited.

Another relevant issue concerns the relationship between financial development and employment inequality. In theory, efficient financial sectors should help reduce inequality by facilitating access to capital and incentivizing the expansion of dynamic, labor-intensive sectors (Levine, 2005). However, many scholars show how in many contexts financial growth can be accompanied by phenomena of employment polarization, with the creation of high- and low-skill jobs and the gradual erosion of intermediate occupations (Piketty, 2014; Stiglitz, 2012). This process has been particularly evident in the United States, where the expansion of the high-tech and financial sector has produced an increase in precarious and low-skill jobs alongside high-paying occupations (Autor DH, 2014).

A comparison of unemployment rates and different national financial models confirm this complexity. In countries with diversified financial systems, where firms can rely on both bank credit and access to capital markets, labor markets are

generally more resilient and inclusive (Beck et al., 2007). In contrast, in countries with a high dependence on bank credit, such as Italy or Spain, crisis phases often result in prolonged credit constraints, which particularly affect SMEs and lead to a rapid deterioration in employment conditions (Cecchetti & Kharroubi, 2012).

Aware of these critical issues, the European Union has in recent years promoted a series of policies aimed at strengthening the link between financial development and inclusive growth. The Capital Markets Union (CMU) project, launched in 2015, aims to integrate and make European capital markets more accessible, particularly benefiting SMEs and innovative companies, which have traditionally suffered from continental financial fragmentation (European Commission, 2015). Through measures of regulatory simplification, harmonization of prospectuses, and creation of new financial instruments, the CMU aims to diversify sources of financing for businesses and reduce dependence on bank credit, improving the ability to invest and create new jobs.

This is complemented by the Next Generation EU program, launched in 2020 as an extraordinary response to the pandemic crisis. This €800 billion-plus public and private investment package includes a strong focus on the green and digital transition, sectors considered strategic for European competitiveness and with high employment potential (European Commission, 2020). The structure of the program, based on grants and soft loans, allows capital to be mobilized for the benefit of infrastructure projects, technological innovation and training, with the stated aim of creating quality employment and reducing territorial and generational disparities.

Another area of financial innovation concerns the spread of social impact instruments, such as Social Impact Bonds (SIBs) and funds dedicated to youth employment and social cohesion. These instruments, based on public-private partnership logics and payment-by-results mechanisms, are finding increasing application in several European countries to finance programs for employment inclusion, vocational training and reintegration of disadvantaged individuals into the labor market (Fraser et al., 2018).

Some national cases offer significant insights into the relationship between the financial system and employment. In Germany, employment resilience during crises was fostered by the Drei-Säulen financial model, based on the coexistence of large universal banks, public savings banks and cooperative banks. This set-up made it possible to maintain stable credit flows to SMEs and preserve the productive fabric even during recessions. The strong relationship between territorial banks and small businesses has helped to contain unemployment and support programs to reduce working hours (Kurzarbeit), which have prevented mass layoffs (Hardie & Howarth, 2013).

In Italy, on the contrary, difficulties in access to credit for SMEs, exacerbated by the banking crisis and the high level of impaired loans, have had direct repercussions on employment, particularly in southern areas. The absence of a solid territorial banking network and the poor integration of capital markets have limited the ability of firms to invest and absorb new labor. Only in recent years, thanks to Guarantee Fund interventions and private equity incentives, have there been signs of improvement (Andrieș et al., 2018).

Finally, the case of the United States offers a prime example of how financial development, while a driver of economic growth, can generate ambivalent effects on the labor market. The growth of the high-tech and financial sector has fostered the expansion of high-skilled and well-paid occupations, but at the same time it has contributed to employment polarization, with the rise of precarious and low-wage jobs, especially in services and logistics. The geographical concentration of opportunities in large metropolitan areas has also exacerbated spatial inequalities and hindered social mobility (Piketty, 2014; Autor DH, 2014).

If well directed, the financial system can be a powerful tool for inclusive growth and the reduction of employment inequality; in the absence of appropriate policies, however, it risks amplifying inequality and precarization.

1.7 Financial Development and Economic Growth

In recent decades, the link between financial development and economic growth has occupied a central position in international economic debate. The ability of a financial system to efficiently allocate savings, finance innovation and support entrepreneurial activity is now recognized as an essential component of economic development processes (Levine, 2005). However, the nature and intensity of this relationship remain the subject of theoretical controversy and differing empirical assessments. The debate has intensified particularly in the wake of the 2008 global financial crisis, which revealed how uncontrolled expansion of finance can also amplify systemic instabilities, damaging real growth (Stiglitz, 2010; Cecchetti & Kharroubi, 2012). For European economies, characterized by heavy reliance on bank credit and a fragmented financial structure, understanding the transmission mechanisms between finance and growth and identifying the best policies for financial regulation and development is a strategic priority to ensure sustainable and inclusive growth.

The theoretical debate on the relationship between the financial system and economic growth has its roots in classical thinking and has developed along several schools of thought.

Joseph Schumpeter (1911), as early as the early twentieth century, emphasized the crucial role of bank credit in encouraging innovation and accompanying entrepreneurial activity, attributing to financial intermediaries the function of selecting and financing the most promising projects. In contrast, the neoclassical approach, which developed in the second half of the twentieth century (Goldsmith, 1969; McKinnon, 1973), recognized the financial system as having a more neutral function, considering it useful for allocating resources and reducing transaction costs, but subordinate to the level of available savings. Since the 1980s, endogenous growth theory (Romer, 1986; Levine, 1997) has brought the role of finance as a determinant of long-run growth back to the center of analysis, arguing that an efficient financial system promotes physical and human capital accumulation, technological innovation and productivity. Of a different view is the post-Keynesian perspective (Minsky, 1986; Stiglitz, 2012), which insists on the destabilizing aspects

of finance, highlighting the risks of speculative cycles and debt accumulation that can undermine macroeconomic stability.

These theoretical positions can be summarized in a conceptual scheme that contrasts optimistic views, according to which financial development is a necessary condition for economic growth (Schumpeter, 1911; Levine, 2005), with more critical perspectives that emphasize its potential distorting effects (Minsky, 1986; Stiglitz, 2012; Arcand et al., 2015). While Schumpeter and endogenous growth economists see finance as an engine of development, post-Keynesians call for caution, warning of the risks of over-financialization and cyclical instability.

The mechanisms through which the financial system affects real growth are multiple and interconnected. First, finance enables the transformation of savings into productive investment, reducing information asymmetries between savers and firms and facilitating the selection of the most efficient projects (Levine, 2005). Second, it facilitates risk diversification and enables enterprises to access capital to expand their business (Demirgüç-Kunt et al., 2005). Another important channel is innovation, since financial markets and banks can finance high-tech activities and start-ups that would be unlikely to receive support through traditional credit (Schumpeter, 1911; King & Levine, 1993). Empirical evidence confirms that higher financial development is correlated with a higher GDP per capita growth rate, especially in middle-income countries and emerging economies (Levine, 2005; Beck et al., 2007).

Empirical evidence gathered internationally returns a multifaceted picture. Many studies conducted from Levine (2005) and Beck et al. (2007) have confirmed the existence of a positive relationship between financial development and economic growth, especially in low- and middle-income countries. However, more recent analyses have shown that beyond a certain threshold the relationship tends to weaken and, in some cases, become negative, a phenomenon referred to in the literature as too much finance (Arcand et al., 2015; Cecchetti & Kharroubi, 2012). In Europe, studies conducted by the European Central Bank (2022) and the European Commission (2020) have found that the degree of financial development

affects growth to varying degrees among member countries, with effects more pronounced in peripheral countries, where expanded access to credit and financial markets has supported growth but also produced vulnerabilities.

One of the most problematic aspects of this relationship is the role of financial crises. The literature (Stiglitz, 2012; Arcand et al., 2015) has pointed out how financial sector growth can fuel boom and bust cycles, increasing the volatility of growth and the likelihood of prolonged recessions. The concept of over-financialization, or finance growing beyond the needs of the real economy, has been used to explain the instability observed in recent decades and the slowdown in potential growth in advanced economies (Cecchetti & Kharroubi, 2012). The 2008 global crisis marked a turning point, demonstrating how deregulated and hyper-leveraged finance can generate long-term economic and social costs.

In this context, policy implications assume strategic importance. The priority, for European institutions, is to promote financial development that is sustainable, resilient and functional to real and inclusive growth (European Commission, 2020; ECB, 2022). Initiatives to complete the Banking Union and Capital Markets Union (Hardie & Howarth, 2013), aimed at strengthening the stability of the banking system and encouraging diversification of financing sources for businesses, are moving in this direction. At the same time, support for innovative instruments such as green bonds, social impact bonds, and investment funds dedicated to the green and digital transition is a lever to steer the financial system toward qualitative, sustainable, and socially inclusive growth objectives (Fraser et al., 2018).

Looking forward, the debate on the relationship between financial development and economic growth will necessarily have to integrate with issues of environmental sustainability, inequality reduction, and systemic risk management. Finance, if it is to be a real driver of development, will have to be regulated in a way that prevents speculative drifts and ensures fair and widespread access to financial resources, especially for SMEs and for projects with a social and environmental impact. The construction of a more integrated, stable and long-term oriented European financial

market is, in this sense, a necessary condition for sustaining solid, inclusive and lasting economic growth.

1.8 Financial Development and Income Inequality

The relationship between financial development and income inequality represents one of the most controversial issues in contemporary economic theory and policy. While the classical literature (Schumpeter, 1911) has emphasized the positive role of the financial system in sustaining economic growth and fostering broader participation in development processes, the dynamics observed in recent decades have shown how the expansion of finance can exacerbate income inequality, especially when access to financial services remains limited to a narrow section of the population or when financial markets are geared primarily for speculative purposes (Stiglitz, 2012; Piketty, 2014). The issue has emerged forcefully in academic and policy debate following the 2008 global financial crisis and, more recently, the pandemic crisis, which highlighted the fragility of highly financialized economies and the risk that finance, rather than reducing, may amplify economic and social inequality (Arcand et al., 2015).

On the theoretical level, reflections on the link between finance and inequality have developed along different lines. In a traditional Schumpeterian- and neoclassical-derived approach (Schumpeter, 1911; Levine, 2005), the financial system is conceived as a mechanism capable of channeling savings toward productive investment and facilitating the entry of new entrants into the market, thereby reducing barriers to access to capital and promoting social mobility. More recently, endogenous growth theory (Levine, 1997) has reiterated this approach, arguing that financial development, by facilitating innovation and human capital accumulation, contributes to more inclusive growth.

In opposition to these optimistic readings, part of the post-Keynesian literature (Minsky, 1986; Stiglitz, 2012) has pointed out that finance tends, in the absence of proper regulation, to concentrate in the hands of a privileged minority, fueling financial rents and speculation, at the expense of income redistribution. Authors such as Stiglitz (2012) and Thomas Piketty (2014) have shown how earnings from

financial activities are much more unequally distributed than labor income, and how excessive growth in finance can lead to wealth polarization and widen the gap between social classes. At the theoretical level, therefore, the link between financial development and inequality depends heavily on the ways in which financial services are accessed, the institutional structure of markets and regulatory choices.

The mechanisms through which finance influences income distribution are multiple. A first channel relates to access to credit, which in advanced economies tends to favor those already equipped with collateral and established banking relationships, excluding the most vulnerable (Beck et al., 2007). Second, financial markets, especially in the absence of regulatory constraints, can fuel speculative bubbles that, although they may temporarily expand the wealth of a section of the population, end up exacerbating inequality when they collapse, penalizing small investors and the least protected (Minsky, 1986; Arcand et al., 2015). Another channel is the allocation of capital: in highly concentrated financial systems, resources tend to flow to large groups and the most economically developed areas, thereby excluding peripheral regions and small businesses, exacerbating spatial and employment inequalities.

Differences in financial models and economic environments play a crucial role in modulating these effects. In the advanced countries, where the financial systems are more developed, the financialization of the economy has produced a twofold dynamic: on the one hand, it has made some basic financial services, such as mortgages or personal loans, more accessible; on the other hand, it has accentuated inequalities in the distribution of financial rents and asset ownership. In contrast, in emerging countries, where the financial system is shallower and banking coverage is limited, inequalities stem mainly from the financial exclusion of large segments of the population, who remain deprived of access to credit, savings and risk protection instruments.

Empirical evidence confirms this complexity. Studies conducted by the International Monetary Fund (2020) and the World Bank (2022) have found that, globally, the expansion of financial services initially tends to reduce inequality by

promoting financial inclusion and the financing of new business ventures. However, beyond a certain threshold, the excessive growth of the financial sector and its concentration in speculative segments can reverse this effect, increasing inequality (Arcand et al., 2015). In Europe, the data show greater inequality in countries with more concentrated financial systems and greater dependence on bank credit, such as Italy, Greece and Spain, than in northern European countries and Germany, where more relational finance and a network of local lending institutions have helped contain inequality.

A particularly relevant finding concerns the period following the 2008 crisis and the Covid-19 pandemic. In both cases, credit tightening and market volatility hit lower and middle income groups and small businesses the hardest, widening wealth and income inequalities (Beck et al., 2007; IMF, 2020).

Precisely from this perspective, financial inclusion policies are one method of countering the inequalities generated by financial development (World Bank, 2022). In many emerging countries, microfinance, fintech and mobile banking programs have enabled the extension of basic banking services to previously excluded segments of the population, improving opportunities for savings, investment and insurance protection. Even in peripheral Europe, the expansion of digital tools and fintech services has reduced some barriers to access, although significant territorial and generational differences persist.

However, the risk of over-financialization remains, i.e., of finance growing beyond the needs of the real economy and tending to shift predominantly toward speculative and high-yield activities, with little benefit to employment and income distribution. In these contexts, financial boom and bust cycles can lead to regressive effects, exacerbating wealth inequalities and affecting the least protected workers in recessions. Indeed, studies have shown how speculative bubbles, in addition to undermining macroeconomic stability, tend to polarize gains, concentrating them in the hands of institutional investors and financial traders (Minsky, 1986; Arcand et al., 2015).

Considering this evidence, the development of public and regulatory policies aimed at reducing the inequalities generated by financial development appears essential. Among the most effective interventions are the strengthening of prudential regulations to limit speculation, the promotion of financial instruments geared toward social and environmental sustainability, and the creation of guarantee mechanisms for vulnerable groups to access credit. In Europe, the Capital Markets Union project, the completion of the Banking Union, and the expansion of microcredit and social impact investing programs represent important steps in this direction (Fraser et al., 2018). In parallel, financial education plays a strategic role in enabling citizens to consciously access financial services and defend themselves against the risks of exclusion or over-indebtedness.

CHAPTER 2

Does Banking Diversity Matter on the Financial Development–Entrepreneurship Nexus? Evidence from Developed and Developing Countries

Abstract

Chapter 2 explores the impact of financial development on entrepreneurship through an empirical analysis conducted on 51 countries over the period 2006-2020 applying the Heteroskedasticity Instrumental Variable approach (IV-H) proposed by Lewbel (2012)[2]. Particular attention is paid to the distinction between commercial banks and cooperative banks/credit unions, taking into account their various missions, governance frameworks, and capacities for risk assessment. The empirical results show that a higher density of bank branches, both commercial and cooperative, encourages the creation of new businesses, although the effect of commercial banks is more pronounced. There are also significant factors that influence entrepreneurship, such as increased trade openness and per capita income, which boost entrepreneurial activity, and high population density, which decreases the likelihood of starting new enterprises.

2.1 Introduction

According to Iakovleva et al. (2011), Lepojevic et al. (2016), and Acs et al. (2009), entrepreneurship, understood as the act of starting new businesses, is considered the engine of economic growth, innovation, and social progress. Indeed, new businesses contribute to job creation, technological progress, and competition, as entrepreneurs often drive innovations and introduce new products and services to the market. However, the path to starting and sustaining a business is fraught with challenges,

[2] Chapter 2 is drawn from previously published work (Barra & D'Aniello, 2025: Does banking diversity matter on the financial development-entrepreneurship nexus? Evidence from developed and developing countries. *Journal of Evolutionary Economics,* 35(2), 281-308).

including the significant risk of failure, especially in the early stages due to high start-up and operating costs coupled with market uncertainties. This makes access to reliable and affordable financial resources a decisive factor for the survival and success of start-ups (Iakovleva et al., 2011). The nature of entrepreneurship varies significantly across socio-economic contexts. In fact, it has been shown that entrepreneurial activities can flourish in more turbulent environments and that the combination of new opportunities constantly appearing on the market and uncertainty about the future, even with employment, can stimulate young people to engage in entrepreneurial activities. For this reason, policymakers in developing economies should focus on training young people in start-up activities to ensure innovation-driven entrepreneurship. Developed countries need to consider that entrepreneurial activities depend on the dynamism of the economic environment and risk-taking behavior. Therefore, overly stable or socialist social systems may be an obstacle to the process of increasing a nation's entrepreneurial potential (Lepojevic et al., 2016). In developed countries, the contribution of entrepreneurship to economic growth is greater than in developing countries. The differences in the effects of entrepreneurship on economic growth are mainly due to the structure of entrepreneurial activities. In developed countries, opportunity-based entrepreneurship and high-expectations entrepreneurship predominates, which are the greatest contributors to economic growth, while necessity-based entrepreneurship prevails in developing countries (Acs et al., 2009). Fast-growing business owners and entrepreneurs who started their business based on opportunities identified in markets in developed countries use a higher level of national knowledge development and a higher level of freedom from government influence to generate results and achieve rapid business growth. This is not the case in developing countries, which are characterized by limited access to capital, technological innovation, knowledge and other resources, limiting business growth. The problem in developing countries is that many residents start businesses for personal work and to earn an income. Consequently, they set up their businesses even in the absence of economic feasibility. Such enterprises usually have a slow development and a limited contribution to economic growth (Agarwal et al., 2010). Furthermore, it should be noted that the link between financial development and entrepreneurship

does not depend solely on the overall level of development of the financial system. In fact, it also depends on how this development translates into the actual availability of resources for entrepreneurs. The literature frequently uses synthetic indicators of financial development (depth, efficiency, and size of markets), but the decision to start a business also depends on other mechanisms. These include the ability of intermediaries to select viable projects, reduce information asymmetries, and contain financing costs (Amin et al., 2023). In this context, the composition of the banking system is important in determining the extent to which financial development translates into the creation of new businesses. Locally based intermediaries can promote financing methods based on long-term relationships and "soft" information. This helps to mitigate the information asymmetries that typically penalize start-ups and micro-enterprises. Conversely, systems that are more concentrated or oriented towards large customers can accentuate credit rationing for innovative and riskier projects. This reduces the likelihood of new ventures being launched and growing. It is therefore important to understand whether banking diversity is a condition that can strengthen, mitigate, or differentiate the relationship under examination (Audretsch & Belitski, 2017).

In this context, the present chapter makes a significant contribution to the literature on the relationship under examination in several respects. Firstly, the innovative contribution of the chapter lies in its analysis of banking diversity as a mechanism through which financial development is transmitted to the real economy. It considers the heterogeneity of financial intermediaries in terms of governance models, territorial roots, and credit collection and allocation capabilities. These characteristics have a significant impact on the availability of financial resources for start-up entrepreneurs and micro-enterprises. These companies are, in fact, more exposed to problems of information asymmetry and credit rationing (Banerjee & Duflo, 2014). By focusing on the coexistence of different banking models, the chapter sheds light on the specific channels through which financial development can translate into the creation of new firms, thereby supporting a more dynamic and growth-oriented form of entrepreneurship. Therefore, the chapter allows us to understand through which channels finance can support more dynamic and growth-oriented entrepreneurship. Secondly, the paper contributes to the existing debate by

introducing a comparative perspective between developed and developing countries. It shows that the intensity of the link between financial development and entrepreneurship is not uniform, but depends on a country's income level and the quality of its institutions. The joint analysis of these dimensions makes it possible to overcome a universalistic view of the finance–entrepreneurship nexus and to highlight how the same financial mechanisms can produce different effects depending on the economic and institutional context.

This chapter uses a sample of 51 countries (developed and developing) from 2006 to 2020 to try to answer two critical research questions: Is financial development useful for new business formation? Is banking diversity important in the context of financial development and entrepreneurship? Regarding the first question, we can state that certainly this topic has been addressed by several scholars in the literature, but often their work still leaves many questions open. According to Dutta & Meierrieks (2021), financial development contributes positively to entrepreneurial activity by satisfying entrepreneurs‘ demand for accessible, inexpensive, and extensive credit and investors’ demand for efficient and cost-effective risk and information management. According to King & Levine (1993a, b), financial systems assess potential entrepreneurs, mobilize savings to finance the most promising activities, diversify the risks associated with innovative activities, and reveal the expected returns from engaging in innovation rather than producing existing goods with existing methods. The underlying objective of this analysis is therefore to test whether financial development effectively reduces liquidity constraints and stimulates new business formation (H1), whether different types of financial intermediaries exert heterogeneous effects on entrepreneurial dynamics due to their governance and territorial embeddedness (H2), and whether the link between financial development and entrepreneurship operates with varying intensity in countries with different levels of income and institutional quality (H3).

Improved financial systems increase the likelihood of successful innovation and, consequently, economic growth. Similarly, imbalances in the banking sector hamper the rate of economic growth by reducing the rate of innovation. Regarding the second argument, to the best of our knowledge, there is no such work in the literature, making a judgment impossible.

The remainder of the chapter is structured into six main blocks. Sections 2.1–2.2 frame the research problem by discussing the finance–entrepreneurship nexus in developed and developing countries and positioning the contribution of this chapter within the existing literature. Section 2.3 provides an overview of the global banking system, with particular emphasis on the coexistence and distinctive features of commercial banks, cooperative banks and credit unions across different country groups. Section 2.4 presents the data, describing the construction of the main variables and offering preliminary descriptive evidence. Section 2.5 outlines the econometric strategy and reports the core empirical results for the relationship between financial development, banking diversity and entrepreneurship. Section 2.6 conducts additional robustness checks, focusing on the role of wealth and institutional quality in shaping the estimated nexus. Finally, Section 2.7 concludes by summarizing the main findings and discussing their policy implications.

2.2 An Overview of Literature

Given the importance of entrepreneurship as a driver of economic growth, identifying the factors that encourage or restrict entrepreneurial activity is crucial. Individual, corporate, and national-level research are all conceivable (Wennekers & Thurik 1999). Individual characteristics such as risk-taking attitudes, education and experience, age, and alternative employment opportunities may influence the decision to become an entrepreneur (e.g., Cuervo, 2005). At the firm or industry level, factors such as competitiveness, market size, firm size, and corporate culture may be crucial (e.g., Wennekers & Thurik, 1999).

Starting and managing a business, particularly for (potential) entrepreneurs, typically entails significant start-up and operating costs. In other words, entrepreneurs frequently seek large amounts of external loans at low interest rates in order to develop and manage their firms. In this scenario, financial intermediation can address the entrepreneurial requirement for financing for two reasons. First, financial intermediaries can distribute funds at a reasonable cost. Companies, for example, can save money on savings mobilization expenses by focusing on savings collecting (e.g., Levine, 1997). Second, financial intermediaries can provide substantial credit, reducing the risk of economically inefficient scales and, in turn,

enhancing the attractiveness of capital-intensive business projects for potential entrepreneurs. Furthermore, employing financial intermediaries enables entrepreneurs to do business with minimal operational expenses (e.g., credit card payment, wire transfer), boosting entrepreneurial activity that would otherwise fail owing to excessively high operating costs.

A growing branch of literature explicitly examines this mechanism in Asia. In particular, the work of Amin, Khan & Maqsood empirically demonstrates that financial development is a statistically significant positive determinant of entrepreneurial activity across Asian countries (Amin et al., 2023; Richardson, 2004). Their findings confirm that greater efficiency, depth, and accessibility of financial systems lower entry barriers and stimulate firm births, while financial openness acts as a positive moderator, amplifying the elasticity of entrepreneurship to financial development through international capital inflows and access to cross-border financial instruments (Estrada et al., 2010; Rethel & Thurbon, 2020).

Simultaneously, financial intermediation benefits (potential) entrepreneurs' investors, i.e., creditors. These lenders are very concerned with risk and information management. To begin, every investment decision carries a unique risk. Risk should be especially high in the context of new firm formation, where market conditions and the impacts of innovative activity are unknown, learning curves are steep, and business networks are new. This risk can reduce the attractiveness of investing in entrepreneurial operations. Individual investors, on the other hand, can use financial intermediation to manage and distribute investment risk (e.g., through portfolio diversification), minimizing exposure to the risk associated with specific investment projects (Levine, 1997).

In addition, creditors incur significant information costs both when contemplating specific investment projects (e.g., assessing entrepreneurs' capabilities) and after making an affirmative investment choice.

Regarding the latter aspect, information asymmetry between the investor and the financier (i.e., the entrepreneur) generates incentives for entrepreneurs to falsify results (e.g., firm profits) to creditors (Shleifer & Vishny, 1997). Faced with these information costs, creditors may turn to financial intermediaries to acquire and process information about available investment opportunities (e.g., Lee, 1996),

delegating to them the monitoring of investment projects and thus saving the financial intermediary money (Levine, 1997).

In essence, (possible) entrepreneurs' demand for accessible, inexpensive, and extensive credit, as well as (potential) investors' (creditors') demand for efficient and cost-effective risk and information management, produces a broad demand for financial intermediaries.

However, the finance-entrepreneurship nexus is not universal. This intuition emerges clearly in developing regions. The literature shows that, in Africa, financial development alone does not automatically translate into higher firm births due to credit misallocation toward incumbents and speculative uses (Ajide & Ojeyinka, 2022; Atiase et al., 2018). Their threshold model identifies a pivotal financial development turning point at approximately 26.5% of system maturity. Beyond this threshold credit access becomes entrepreneurship-enhancing. Importantly, regulation quality is found to be a significant positive moderator, further supported by evidence on the role of financial inclusion in stimulating entrepreneurial dynamics only under well-functioning institutional settings (Ajide, 2020). This confirms that the financial system stimulates entrepreneurship only when the institutional and regulatory environment ensures transparency, enforceability, and cost-effective market access procedures. Financial development can be defined at the country level as an improvement in the quality of the five key financial functions discussed above (risk management, information management and resource allocation, corporate control, mobilization and pooling of savings, and facilitation of economic transactions through a financial infrastructure) (Čihák et al., 2012). As a result, countries with better levels of financial depth, access, efficiency, and stability have higher levels of financial development.

Entrepreneurship should benefit from financial development in several ways. For example, high levels of financial inclusion make it more likely that entrepreneurs will obtain loans based on their talent rather than their social standing, expanding the pool of potential entrepreneurs and, consequently, increasing national levels of entrepreneurship. Accordingly, we hypothesize that financial growth promotes entrepreneurial activity, in line with pioneering research (Schumpeter, 1934; King & Levine, 1993a, b).

This capability-based channel is also confirmed in rural China, where inclusive finance increases provincial-level agricultural firm births, although necessity-driven entrepreneurship persists in backward regions (Jiang et al., 2019). The literature shows that Asia exhibits a multi-speed dynamic in financial inclusion: eastern Chinese provinces (Guangdong, Shanghai, Zhejiang, Jiangsu) report the highest Inclusive Finance Index (IFI) levels, central provinces moderate levels (Henan, Hunan, Hubei), while western provinces remain systematically lower (Guizhou, Gansu, Qinghai). The estimations confirms that inclusive financial development, despite widening East–West gaps, remains a driver of rural entrepreneurship by lowering borrowing costs and reducing geographical and transaction frictions, particularly when combined with infrastructure expansion and regional economic openness (Qin et al., 2022; Xu et al., 2024). A parallel literature stream also explores the organizational geography of credit access. During the period under analysis, developed countries experienced a decrease in the number of bank branches. According to Barbieri et al. (2021), the decrease in bank branches is attributed to technological innovations, changes in customer behavior and competitive dynamics, which make physical proximity less relevant. However, the physical presence of banks is still important in preventing financial exclusion, especially in areas with an older population, which tends to prefer physical interaction with banks. According to Costanzo et al. (2023), institutional diversity in the banking sector is a key element in mitigating the negative effects of branch closures. Branch reduction, while contributing to cost rationalization, may exacerbate credit access problems for SMEs and increase business exit rates in times of economic crisis. Research suggests that the coexistence of different banking models may better support the real economy than a more homogeneous and centralized banking system. Finally, Fasano & La Rocca (2024) argue that the density of local bank branches remains a determining factor for SME financing in Europe, despite the increasing digitization of financial markets. However, the influence of the local banking system diminishes in the presence of a more developed national banking system. The combined effect of local and national banking policies is therefore essential to support economic growth and reduce financial constraints on companies. Regarding the banking system in developing countries, we can state that

it is characterized by peculiar dynamics that influence financial stability and contribution to economic growth. As pointed out by Hao et al. (2023), the Chinese banking network shows a high degree of interconnectedness and complexity, with increasing centralization and a multi-tiered structure, where large banks dominate the system. These features, although useful for greater operational consistency, may accentuate systemic risks, especially in the event of financial crises, making prudent management of macroprudential policies essential to diversify linkages and reduce the centrality of larger institutions. At the same time, Nizam et al. (2021) highlight the role of financial inclusion in promoting business growth in ASEAN-5 countries. However, access to credit has a non-linear effect: while a moderate level of inclusion stimulates growth, excessive financing can have negative effects on firm performance, especially above certain threshold levels. This evidence suggests that, in developing contexts, financial regulation and planning must balance system stability with promoting access to credit, considering structural specificities and optimal thresholds to maximize economic benefits.

2.3 A Summary of the Global Banking System

Several institutions have historically participated in the international banking industry, both institutionally and operationally. In this context, the primary distinction is between commercial and credit unions and cooperative banks. These actors differ in terms of their legal and governance structures, customer relationships, business strategies, and market lines they wish to focus on. While commercial banks often adhere to the shareholder value model, cooperative banks are more likely to adopt a stakeholder approach. Because there are so many financial participants in the world-wide banking business, some experts categorize countries according to their financial and banking systems as bank-based or market-based (Rajan & Zingales, 2003a, b).

Banks are crucial in transmitting investor capital to non-financial enterprises in a bank-based society. They bring together disparate capital providers and supervise the businesses to which they lend on behalf of depositors (Boot & Thakor, 2008). Markets, according to the market-based paradigm, connect firms to capital providers since participation in the stock and corporate bond markets assists organizations in

raising finance. Throughout history, banks have typically played a larger role in Japan and continental Europe than in the United States, where markets dominate capital transactions. Of course, differences between financial systems are typically a matter of degree (Allen et al., 2004). Small enterprises in the United States are financed through banks.

Corporate bonds have expanded in historically bank-based Germany during the last decade. The German banking system, for example, is organized into three groups: private commercial banks, which can be further subdivided into two subgroups: the limited group of major banks and the huge and diverse group of other private credit institutions. These are shareholder-value banks, i.e. which are operated legally and practically to benefit their shareholders. Public savings banks, regional savings banks, and municipal savings banks comprise the second group. They are also banks that are concerned with shareholder value. The third type of banking is cooperative banks and their core financial and non-financial operations. They are value banks for stakeholders.

Global finance has pushed most developed countries toward market-based design (Rajan & Zingales, 2003a, b). Originally, the majority of Western Europe's continent had three financial organizations similar to Germany's. This demonstrates that there was little variance among national banking systems. However, with the exception of Germany and Austria, all nations have lately undergone significant banking system modifications. Big private banks that prioritize shareholder value have gained importance at the expense of institutions that prioritize stakeholder value. For example, in the United States, numerous large commercial banks prioritize shareholder value and dominate the market. As a result, the role of small local private banks has significantly declined.

Credit cooperatives have long been an attractive alternative to profit-driven banks and play a vital role, especially in Europe. For instance, the Danish Rabobank has a substantial market share, with over half of all Danes being members (Birchall & Ketilson, 2009). Other cooperatives hold some of the world's largest banks, notably the Pohjola Group of Finland, Credit Agricole of France, and Raiffeisen of Germany (Bunger, 2009). The International Cooperative Bank Association (ICBA) is comprised of all cooperative banks in various countries, including Banche

cooperative and Banche popolari in Italy, building societies and credit unions in the United Kingdom, and mutual savings and loans and credit unions in the United States.

A cooperative is defined by the International Cooperative Alliance as "an autonomous group of individuals joining voluntarily to achieve their common economic, social, and cultural needs and ambitions through a democratically governed company" (ICA 2007). Cooperative financial institutions, according to McKillop et al. (2020), encompass a wide range of member-owned financial intermediaries such as credit unions/caisses populaires, savings and credit cooperatives, cooperative banks, and Shinkin Banks. Credit unions (or caisses populaires) are common in North America, although cooperative banks are the most common organizational model in many European countries. The institutional structure, legal and regulatory status, product selection, and business practices differ between countries, notably between developed and developing countries (Cuevas & Buchenau, 2018; Cuevas & Fischer, 2006).

Credit unions and caisses populaires are non-profit organizations that offer its members services. Shinkin banks are also non-profit entities, however they only lend to members and accept deposits from non-members. Cooperative banks are for-profit organizations that provide services to both members and non-members. However, unlike shareholder-based commercial banks, cooperative banks seek to make a profit in order to build capital and support long-term growth. Nonetheless, the most fundamental traits shared by these lending institutions are democratic governance and mutualism.

The present credit union movement can be traced back to the pioneers of German cooperatives. Cooperative financial organizations flourished in other European countries as a result of the spread of cooperative values from Germany. Cooperatives are distinguished by two fundamental qualities. The first is that they are owned by non-investors, often customers or employees. Each member has the same voting power regardless of their financial contribution to the organization, according to the "one member, one vote" principle (Jones et al., 2008). These two characteristics differ from those of commercial banks, where investors are only tied to the institution through ownership; each owner has power proportional to his or

her investment.

Savings and loan associations, on the other hand, have voting systems that benefit wealthy depositors. Mutual savings banks are free to accept any customer in addition to working for the profit of their shareholders. Due to these fundamental distinctions, mutual savings banks are not exempt from income taxes, although credit cooperatives are. However, these collectively owned banks act as a bridge between cooperatives and commercial banks. Credit unions are a type of cooperative bank that is a self-help cooperative financial institution that aims to achieve the economic and social goals of its members and the larger local community. Each credit union is governed by its members. The membership elects unpaid volunteer officers and directors who set the credit union's operating policies. Every credit union member has one vote, regardless of how much money they have in savings or loans with the credit union. They serve a membership that is distinguished by a common bond. A pre-existing social link, such as membership in a specific community, industry, or geographic group, serves as the foundation for the common bond. Cooperative banks and credit unions can be treated similarly because of these commonalities. The concept of a credit cooperative spread from Europe to Canada at the turn of the 20th century, and it was from Canada that it entered the United States. Credit unions are currently the most common type of cooperative bank in the United States and Canada.

They are differentiated by mandatory membership (ownership) by all customers as well as a common bond among members; this is most commonly geographical, occupational, or religious in nature. Credit unions in the United States can be chartered by either the federal government or a state. These banks are not all tiny in size. Cooperative banks account for roughly one-third of deposits and somewhat less of loans in the Italian banking market, according to Bongini & Ferri (2007).

According to Hesse & Cihák (2007), cooperative branch shares in selected EU countries are even higher (60% of total in France, 50% in Austria, and around 40% in Germany and the Netherlands), and their market share increased from 9 to 15% of total EU assets from the mid-1990s to 2004.

According to Mckillop & Wilson (2010), there were over 49,330 credit unions in 98 countries in 2009, with over 184 million members and over $1,354 billion

in assets. There is a lot of variability in the credit union movement in these countries. This reflects the diverse economic, historical, and cultural contexts in which credit unions operate. A small fraction of membership in the developing world is concentrated among the financially excluded. These credit unions, which provide minimal savings and loan choices, are solely managed and operated by volunteers. On the other end of the spectrum, credit unions in North America and Australia have members from all economic levels.

The banking system of developed countries is a fundamental pillar for the functioning of their economies, contributing significantly to financial stability, allocative capital efficiency, and global economic integration. This system has some distinctive features that outline its organization and core functions. In these countries, the banking sector operates within a highly developed regulatory framework. Regulators and central banks, such as the Federal Reserve in the United States, implement stringent regulations to ensure the stability of the financial system. Instruments such as minimum capital requirements, stress tests, and liquidity monitoring are widely used to mitigate the risks associated with banking activities (Jaffee & Levonian, 2001). Moreover, banks are not limited to traditional functions such as taking deposits and providing loans. They offer a wide range of services, including asset management, financial advice, market operations, and investment banking (Levine, 1996). This diversification allows banks to generate income from multiple sources, reducing their dependence on the economic fluctuations of specific sectors. Another distinctive aspect is that the banking system is deeply interconnected with global financial markets. Banks often operate internationally, offering cross-border services and facilitating global trade. Direct access to capital markets allows them to finance operations by issuing bonds or other financial instruments. However, this integration exposes banks to risks arising from global shocks, such as financial crises or geopolitical tensions (Jaffee & Levonian, 2001).

In developing countries, on the other hand, the banking system plays a central role in intermediating savings and financing economic activities. In these types of countries, there is a lack of well-developed financial markets, which leads to the dominance of banks as the main financial intermediaries. Weaknesses in legal

and accounting systems prevent investors from properly assessing the solvency of companies and their legal position in case of insolvency. As a result, banks remain the only non-governmental source of liquid financial instruments, further reinforcing their centrality in the economic system (Weisbrod & Rojas-Suáre, 1995). Moreover, due to structural deficiencies, banks favor short-term lending. The lack of accounting transparency and the limited reliability of legal infrastructures force banks to constantly monitor the liquidity of their customers, limiting their ability to finance long-term projects. Although this characteristic ensures prudent credit risk management, it may hinder the development of long-term structural investments (Bencivenga & Smith, 1992). In addition, another relevant feature is the high level of reserves required of banks, which are often forced to hold a significant share of their assets in government bonds or other non-bank instruments. This reduces the banks' ability to offer credit to the private sector, limiting their direct contribution to economic growth (Weisbrod & Rojas-Suáre, 1995).

2.4 Data and Source

This chapter is based on a heterogeneous and unbalanced international dataset, which includes observations from 51 countries (both developed and developing) over the period 2006–2020. The dataset combines economic, banking, and entrepreneurial data, with an emphasis on the role of two main categories of financial intermediaries: commercial banks and cooperative and credit union banks. Key indicators include entrepreneurship, measured by the number of new business registrations per 1000 working-age inhabitants (15–64 years) (World Bank, 2019), and the level of financial development, represented by the number of branches of commercial, cooperative and credit union banks per 100,000 inhabitants and per 1000 km^2 (International Monetary Fund (IMF) Financial Access Survey 2024). In addition, macroeconomic control variables such as GDP, trade openness, education level, population density, and government spending are included to capture structural differences between countries (Wennekers et al., 2005; Freytag & Thurik, 2007; Bjornksov & Foss, 2008).

The dataset has several strengths. The long-time coverage allows for the analysis of

long-term dynamics, including relevant macroeconomic events such as the 2007/2008 global financial crisis. The geographic diversity, encompassing both high-income countries and emerging economies, allows an in-depth comparison of heterogeneous economic environments. Moreover, the focus on banking diversity allows for the exploration of the complementary role of commercial and cooperative banks and credit unions in supporting entrepreneurial activity. However, the dataset also has some limitations. The unbalanced nature of the data may introduce bias in cross-country comparisons, while the use of the number of branches as a proxy for banking diversity may not fully capture the quality of services offered. Furthermore, the measure of entrepreneurship does not take into account the dynamics of business survival over time. Despite these limitations, the dataset provides a solid basis for analyzing the relationships between financial development and entrepreneurship, offering valuable insights for the design of targeted economic policies.

2.4.1 Stylized Facts

Before turning to econometric analysis, it is always important to understand the background. Figure 2.1 depicts the time-series behavior of entrepreneurship, as measured by business density (BUSINESS) and financial development, as measured by the number of credit unions and credit cooperative bank branches per 100,000 inhabitants and per 1000 km^2 (CB_AD and CB_KM2, respectively) and commercial bank branches per 100,000 inhabitants and per 1000 km^2 (COMM_AD and COMM_KM2, respectively) over the time interval. According to this figure, the two variables generally go in opposite directions, with entrepreneurship increasing and financial development falling. Over time, there has been a decline in the number of cooperative and credit union bank branches per 100,000 adults (CB_ AD and COMM_AD, respectively), as well as in the number of cooperative and credit union bank branches per 1000 km^2 (CB_KM2), possibly as a result of the subprime mortgage crisis. The distribution of commercial bank branches per 1000 km^2 shows a tendency in the other direction for cooperative banks. Commercial banks are, in fact, showing signs of improvement (COMM_KM2).

The decline of financial development indicator can be explained by a combination of factors that have reshaped the global banking landscape since the mid 2000s. The

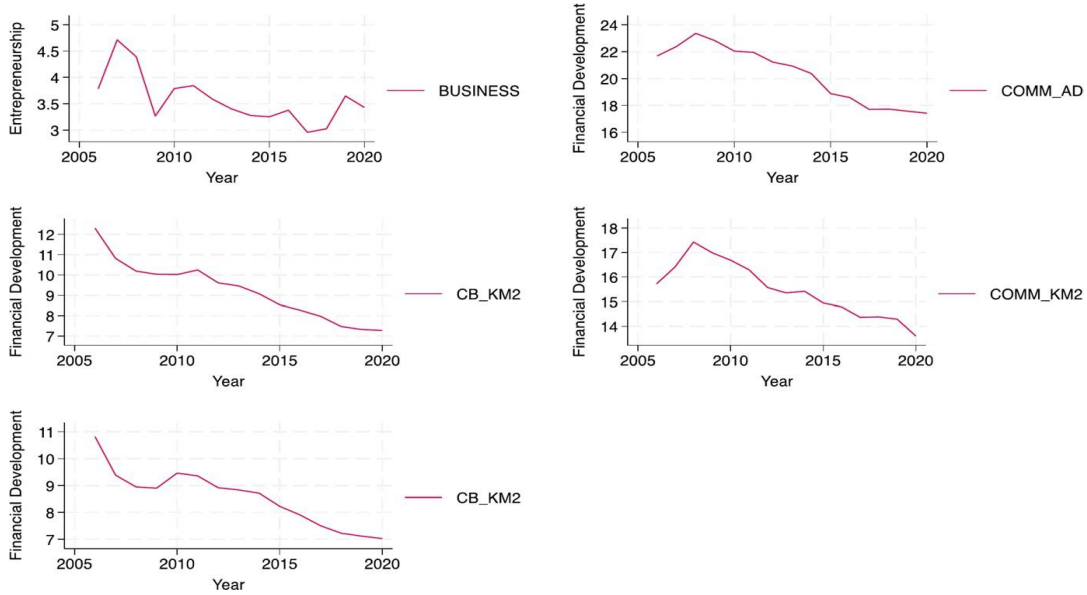
2007–2008 financial crisis marked a turning point. In fact, banks across many countries were forced to consolidate, close unprofitable branches, and streamline operations to comply with stricter capital requirements and supervisory standards. Smaller, locally rooted intermediaries - such as cooperative and credit union banks - were particularly affected, as they often lacked the scale needed to absorb the increased regulatory burden.

Technological change has been an equally powerful driver of this decline. The rapid diffusion of online banking and fintech platforms has significantly reduced the need for physical branches as the primary access point for financial services. Households and firms have progressively shifted toward digital channels for deposits and payments. In that way, the traditional branch networks become less essential and more costly relative to their usage rates.

Demographic and geographic transformations have further accelerated this trend. Urbanisation has concentrated financial demand in metropolitan areas, leaving many rural or low-density regions with declining customer bases. Because cooperative and credit union banks historically played a central role in these areas - often relying on personal relationships - branch closures have disproportionately affected them. That contributes sharply to the downward trend in FD indicators.

Taken together, these factors explain why the measure of financial development display a persistent downward trend over time, even in contexts where overall access to finance or credit availability may not have deteriorated. Instead, they reflect a structural shift from territorially embedded, branch intensive banking models toward more centralised and technologically mediated forms of financial intermediation.

Figure 2.1 Time series of entrepreneurship and financial development



Source: author's elaboration

2.4.2 Descriptives Statistics

Table 2.1 displays statistics grouping the countries by different income levels, i.e., lower-middle income (LMI), upper-middle income (UMI), low income (LI), and high-income (HI), with definitions of the variables employed in the research and details on the sample composition. The highest level of entrepreneurship (BUSINESS) is found in High-Income (HI) countries, which have approximately four times the entrepreneurship (BUSINESS) of Low-Income (LI) countries and around double that of Upper-Middle Income (UMI) and Lower-Middle Income (LMI) countries. Furthermore, a high degree of international trade openness (OPENNESS), total government final consumption spending (GOV_CONS), and population education (EDUCATION) are supported by a low level of taxes (TAXES), while commercial and credit unions as well as cooperative banks are strongly represented in high-income countries (as indicated by the variables COMM_AD, COMM_KM2, CB_AD, and CB_KM2, respectively). Moreover, as expected, high-income (HI) countries have a high level of financial development (as evidenced by CREDITS and DEPOSITS) with respect to other countries.

Beyond describing differences in mean values across income groups, the summary

statistics offer important insights into the structural heterogeneity of countries and help contextualize the empirical strategy adopted in the following sections. High-income countries display not only the highest levels of entrepreneurship (BUSINESS) but also the most favorable combination of structural variables: high educational attainment, strong financial development, greater trade openness, and lower tax burdens. These factors create an enabling environment for opportunity-driven entrepreneurship, where business creation is more likely to be motivated by innovation and growth potential rather than by necessity.

In contrast, low-income and lower-middle income countries show considerably lower business creation rates. The combination of limited financial development, higher tax pressure, lower levels of human capital, and weaker institutional environments significantly constrains the formation of new firms. In these contexts, the entrepreneurial activity observed is often necessity-based and constrained by liquidity limitations, lack of adequate collateral, and restricted access to formal financial services.

The summary statistics also reveal clear patterns regarding banking structure. High-income countries have markedly higher values for COMM_AD, COMM_KM2, CB_AD, and CB_KM2. This confirms that both commercial banks and cooperative/credit union banks are more prevalent and geographically accessible. This diversity in the banking ecosystem suggests that firms and individuals in high-income settings benefit from multiple channels for accessing credit, financial advice, and entrepreneurial support. By contrast, in low-income countries, the lower density of bank branches - especially cooperative and credit union institutions - reflects structural constraints in financial intermediation.

Differences in financial development across income groups are also reflected in the higher levels of CREDITS and DEPOSITS in high-income countries. These indicators confirm that richer economies not only have more advanced financial sectors but also higher levels of trust in the banking system and larger savings pools. This reinforces the idea that the financial system in advanced economies is better equipped to support innovation and entrepreneurial ventures.

Finally, the joint reading of all variables suggests that the environment for entrepreneurship is shaped by the interaction of financial, institutional,

demographic, and macroeconomic factors. In particular, the contrast between the high entrepreneurship rates of HI countries and the markedly lower values for LI and LMI countries highlights the fundamental role of structural conditions in enabling or constraining entrepreneurial activity. This provides further motivation for the econometric analysis presented later, which seeks to quantify how financial development - and the composition of the banking sector - affects entrepreneurship across heterogeneous economic contexts.

Table 2.1 Summary of statistics

	Low Income	Lower-Middle Income	Upper-Middle Income	High Income	Full Sample	Description
BUSINESS	0.6270	2.7752	2.6652	4.8096	3.5072	Number of new business registrations per 1000 people aged 15–64
TRADEMARK	1825.2800	54084.8333	89078.1068	26577.6119	45191.6038	Number of new trademarks registrations per 1000 people aged 15–64
COMM_AD	16.6142	47.7022	49.9430	94.2647	67.2912	Number of commercial bank branches per 100,000 adults
COMM_KM2	21.5236	44.4475	45.1605	71.8501	54.9853	Number of commercial bank branches per 1000 km^2
CB_AD	4.5877	20.9415	17.0184	32.0845	23.7782	Number of credit unions and credit cooperative branches per 100,000 adults
CB_KM2	4.9406	14.5759	8.7734	30.4428	19.8638	Number of credit unions and credit cooperative branches per 1000 km^2
CREDITS	5.7052	8.2089	4.4310	16.3898	10.9058	Private bank credits as a percentage of GDP
DEPOSITS	11.1801	12.7357	2.5000	14.8924	11.0796	Private bank deposits as a percentage of GDP
OPENNESS	69.2770	92.2383	71.9657	105.0369	91.9532	Sum of Imports and Exports to Gross Domestic Product
EDUCATION	7.3020	34.3429	44.0256	69.3435	51.7426	Percentage of tertiary education enrolment
GDP	775.6847	2693.2142	7476.5486	29779.8861	16494.2861	Per-Capita GDP at PPP of International US Dollars
GOV_CONS	17.2172	15.4614	15.3716	20.1823	17.9086	General government final consumption expenditure as a proportion of GD
POP_DENS	177.4279	194.0287	81.4030	103.7402	121.9754	population density is measured as people per square kilometer of land area
TAXES	39.9750	34.6747	44.5390	45.6222	42.9135	Taxes and required contributions levied as a percentage of business profits
N	48	95	126	241	510	

Source: authors' elaboration

Note. **High-Income (HI)**: Australia, Austria, Canada, Chile, Cyprus, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Lithuania, Poland, Portugal, Seychelles, Slovak Republic, Spain, Sweden, **Low-Income (LI)**: Benin, Guinea, Liberia, Malawi, Mozambique, Rwanda, Zimbabwe; **Lower-Middle Income (LMI)**: Bolivia, Cabo Verde, El Salvador, Eswatini, Georgia, India, Kyrgyz Republic, Lesotho, Mauritania, Moldova, Mongolia, Philippines, Vietnam; **Upper-Middle Income (UMI)**: Albania, Belarus, Belize, Brazil, China, Colombia, Costa Rica, Jamaica, Mexico, Romania, Samoa, Suriname

2.4.3 Pearson Correlations

The pairwise correlations between the variables used in the empirical analysis are shown in Table 2.2 On the one hand, the data confirm that there is a positive and significant correlation between entrepreneurship (BUSINESS) and the number of commercial bank branches per 100,000 adults (COMM_AD), implying that as the number of commercial banks per 100,000 adults increases, more people of working age can borrow and thus create new businesses or vice versa. However, it is worth noting that the number of credit unions and cooperative bank branches per 100,000

adults (CB_AD) is favorably (but not statistically) related to entrepreneurship.

According to the controls included in the models, the data confirm that trade openness (OPENNESS) and economic activity (GDP) are both positively and statistically correlated with entrepreneurship (BUSINESS), but government consumption spending (GOV_CONS) is positive but not statistically correlated. Finally, taxes (TAXES) and population density (POP_DENS) are both statistically and negatively correlated to entrepreneurship (BUSINESS).

Compared to earlier measures, our alternative measure of financial development - domestic private credits as a percentage of GDP (volume of credits) - has a positive and statistically significant correlation with entrepreneurship (BUSINESS). However, it has the drawback of not accounting for banking diversity. Lastly, there is a positive but non-statistically significant correlation between the quantity of deposits (DEPOSITS) as a percentage of GDP and entrepreneurship (BUSINESS).

Table 2.2 Pairwise correlations

	BUSINESS	TRADE-MARK	CREDITS	DEPOSITS	COMM_AD	CB_AD	OPENNESS	EDUCATION	GDP	GOV_CONS	TAXES	POP_DENS
BUSINESS	1.00											
TRADE-MARK	0.01	1.00										
CREDITS	0.31***	0.16**	1.00									
DEPOSITS	0.10	0.02	0.68***	1.00								
COMM_AD	0.22***	−0.06	0.47***	0.46***	1.00							
CB_AD	0.01	−0.01	0.24***	0.47***	0.16**	1.00						
OPENNESS	0.21***	−0.21***	−0.16**	0.01	−0.07	0.26***	1.00					
EDUCATION	0.34***	−0.06	0.58***	0.52***	0.30***	0.24***	−0.03	1.00				
GDP	0.30***	−0.06	0.61***	0.64***	0.17**	0.52***	0.18**	0.59***	1.00			
GOV_CONS	0.09	−0.08	0.30***	0.32***	0.14*	0.07	0.10	0.22***	0.42***	1.00		
TAXES	−0.21***	0.27***	0.22***	0.16**	0.10	0.00	−0.41***	0.23***	0.20***	0.13*	1.00	
POP_DENS	−0.18***	0.67***	0.01	0.05	−0.12*	0.08	−0.26***	−0.17**	−0.17**	−0.25***	0.24***	1.00

* $p<0.1$; ** $p<0.05$; *** $p<0.01$.

Source: author's elaboration

2.5 Empirical Framework

2.5.1 OLS and FE Regression

In line with Dutta & Meierrieks (2021), we propose both Ordinary least squares (OLS) and Fixed effects (FE) regression to explore the impact of financial development on entrepreneurship and to assess whether the kind of bank influences the relationship. Accordingly, we propose the following econometric specification

for our analytical purposes:

$$\ln(BUSINESS)_{i.t} = \beta_0 + \beta_1 \ln(FD)_{i,t} + \sum \vartheta \ln(Z)_{i,t} + \gamma_i + \tau_t + \varepsilon_{i,t.1} \quad (2.1)$$

where *ln* is the natural logarithm, *BUSINESS* denotes the proxy for entrepreneurship, measured by the number of new business registrations per 1000 people aged 15 to 64[3]; *FD* represents the proxy for financial development, measured by the number of commercial bank branches per 100,000 adults (COMM_AD) or credit unions and cooperative bank branches per 100,000 adults (CB_AD) (Source: International Monetary Fund (IMF) Financial Access Survey); *Z* is the vector of controls, which includes important environmental factors such as: GDP, per-capita gross domestic product in 2015 constant US Dollars; OPENNESS, trade openness is measured as the sum of imports and exports of goods and services in relation to GDP in order to account for a country's level of internationalization; EDUCATION, the percentage of tertiary education enrolment used to control for educational level. GOV_CONS, general government final consumption expenditure as a proportion of GDP, adjusted for government size; TAXES, Taxes and required contributions levied as a percentage of business profits to offset the impacts of fiscal burden. POP_DENS, population density is measured as people per square kilometer of land area to adjust for demographic influences[4]. All controls were drawn by World Bank - World Development Indicators. In all regressions, time dummies (τ) are included in order to control for omitted variables and cyclical factors (such as financial and public debt crisis), while country dummies (γ) allow us to grasp the heterogeneity of the sample. Standard errors are clustered at the country level. Finally, the

[3] The World Development Indicators (WDI) (World Bank 2019) are used to calculate the density of new enterprises. The chose of WDI is due for two reasons. First, data for a vast number of developing, emerging, and developed countries are available. Other datasets utilised in a variety of research on the country-level drivers of entrepreneurship (e.g., Wennekers et al., 2005; Freytag & Thurik 2007; Bjørnskov & Foss 2008) have fewer observations and frequently focus on developed economies. Second, because the entrepreneurship measure focuses on formal entrepreneurship, it is a suitable option for the examination of the impact of formal financial institutions (both cooperative and commercial) on formal entrepreneurship.

[4] The rate of inflation, as assessed by the consumer price index (CPI), has been included in the regression to adjust for macroeconomic stability.

subscripts i and t are the countries (I = 1, …, 51) and t the time interval (t = 1, … ,15), respectively, while denotes the error term.

2.5.2 OLS and FE, Baseline Results

Table 2.3 displays the baseline results obtained using the OLS estimator with clustering standard errors at country level. Higher levels of financial development (measured by the number of credit unions and cooperative and commercial bank branches) are associated with higher levels of entrepreneurial activity. Basically, Table 2.3 contains six specifications, in which regression (1) considers only the number of credit unions and cooperative bank branches per 100,000 adults, regression (2) considers only the number of commercial bank branches per 100,000 adults, and in (3) only the number of credit unions and cooperative bank branches per 1000 km^2 are considered simultaneously, in regression (4) only the number of commercial bank branches per 1000 km^2 are considered, and in regression (5) only the number of commercial bank branches per 1000 km^2 are considered simultaneously, and in regression (6) these two variables are considered simultaneously. Control variables are included in all regressions.

According to regressions (1), (2), and (3), entrepreneurship is positively and significantly impacted by the number of credit unions and cooperative and commercial bank branches per 100,000 adults (Beck & Demirguc-Kunt, 2006, 2008). This would suggest that the number of new business registrations rises in tandem with the number of branches, serving as a stand-in for financial development. To put it another way, a bank that has more branches is more robust and stronger, which means that it is more likely to lend to applicants, particularly if they have specific and workable plans concerning the establishment of new businesses, than banks that are less stable. This could make it easier for people to finance their businesses by giving them access to financial resources. A higher number of branches reduces informational and geographical friction in accessing finance. It facilitates the collection of soft information on business projects and mitigates information asymmetries between banks and entrepreneurs (Petersen & Rajan, 1995). In addition, greater banking density strengthens competition in the credit market, with positive effects on reducing financing costs

and expanding the supply of loans to new businesses (Levine, 2005). The territorial presence of banks also promotes the spread of complementary financial services (payments, cash management, consulting), which reduce the operating costs of start-ups and increase their chances of survival. In the case of cooperative banks and credit unions, strong integration with the local context and a mutualistic orientation further amplify this effect, supporting micro and small business initiatives (Hesse & Čihák, 2007).

Table 2.3 Entrepreneurship and financial development: Full sample (OLS Regression)

Regressors	(1)	(2)	(3)	(4)	(5)	(6)
CB_AD	0.287		0.311			
	[0.108]***		[0.095]***			
COMM_AD		0.699	0.730			
		[0.198]***	[0.166]***			
CB_KM2				0.293		0.320
				[0.111]***		[0.097]***
COMM_KM2					0.706	0.741
					[0.195]***	[0.162]***
GDP	1.048	0.746	0.840	1.045	0.747	0.838
	[0.278]***	[0.250]***	[0.239]***	[0.277]***	[0.248]***	[0.235]***
OPENNESS	0.153	−0.013	0.045	0.157	−0.008	0.054
	[0.128]	[0.117]	[0.120]	[0.129]	[0.117]	[0.121]
EDUCATION	1.227	0.647	0.370	1.228	0.659	0.378
	[0.269]***	[0.343]*	[0.292]	[0.268]***	[0.336]*	[0.287]
GOV_CONS	−0.200	−0.363	−0.298	−0.199	−0.378	−0.315
	[0.325]	[0.276]	[0.255]	[0.325]	[0.276]	[0.254]
TAXES	−0.304	0.154	−0.073	−0.311	0.153	−0.083
	[0.192]	[0.141]	[0.169]	[0.194]	[0.140]	[0.169]
POP_DENS	0.673	−0.127	−1.057	0.323	−0.921	−2.284
	[0.879]	[0.797]	[0.597]*	[0.871]	[0.909]	[0.672]***
TIME FE	YES	YES	YES	YES	YES	YES
R^2	0.951	0.955	0.960	0.951	0.956	0.960
N	387	382	382	387	382	382

Standard errors are clustered at country level; dependent variable: number of new business registrations per 1000 people aged 15–64 (BUSINESS); all variables are taken in natural logarithms; N: number of observations; * p<0.1; ** p<0.05; *** p<0.01

Source: author's elaboration

This result is supported by regressions (1) and (2), which examine only one explanatory variable at a time, and regression (3), which examines both explanatory variables simultaneously. Economic activity (GDP) and educational attainment (EDUCATION) have a positive and statistically significant impact on entrepreneurship (BUSINESS) in regressions (1) and (2). Put another way, more firms are found in affluent, better educated neighborhoods than in other places.

The positive effect of GDP on entrepreneurship operates through various channels. First, higher levels of production and income imply greater domestic demand, which makes it economically viable for new businesses to enter the market (Acs & Audretsch, 1990; Aghion & Howitt, 1990). Furthermore, richer economies have more developed physical and intangible infrastructure (transport, digitalization, logistics), which reduces the fixed costs of starting and running new businesses (Aschauer, 1989; World Bank, 2019).

With regard to the level of education, we can say that a higher degree of EDUCATION increases human capital. This leads to an improvement in individuals' cognitive, managerial, and technological skills. This is crucial for identifying market opportunities and for the efficient organization of new businesses (Lucas, 1988). Education also promotes a greater capacity to absorb innovation as it facilitates the adoption of new technologies in advanced production processes (Cohen & Levinthal, 1990; Romer, 1990). From a behavioral point of view, higher levels of education are associated with a greater propensity for calculated risk, better decision-making skills, and a higher probability of access to professional and financial networks (Van der Sluis et al., 2008; Colombo & Grilli, 2010). Finally, a high level of education increases the availability of skilled labor, facilitating cooperation between businesses and universities (Audretsch & Feldman, 2004; Guerrero et al., 2016).

However, while the positive impact of GDP is confirmed in regression (3), the effect of educational level disappears, and the significant and negative effect of population density emerges. This result is justified by the fact that, when considering the number of branches per 100,000 adults of both types of banks, a much larger

availability of financial resources is considered than in the previous cases, which implies that people's level of education loses significance (because the number of people who can think of getting a loan to finance their business idea is higher), but population density becomes significant and negative because the number of people who can think of getting a loan to finance their business idea is higher.

High-density areas are characterized by higher start-up and operating costs. In particular, we recognize high costs for real estate, services, and labor, which raise the minimum threshold of profitability and discourage the entry of new businesses (Glaeser et al., 2015; Audretsch & Keilbach, 2007). Secondly, these contexts have more saturated markets and more intense competition. This reduces expected margins and makes product differentiation more difficult, increasing entrepreneurial risk (Fujita et al., 1999). Finally, high density leads to greater selectivity in access to credit. In fact, excess demand causes banks to favor projects with high guarantees, penalizing start-ups and more innovative initiatives (Petersen & Rajan, 1995).

Regressions (4), (5), and (6) give identical results, with the only difference being that the number of cooperative and cooperative branches per 1000 km^2, the number of commercial bank branches per 1000 km^2, or both simultaneously are included as explanatory variables.

As shown by Dutta & Meierrieks (2021), education has no effect on entrepreneurship, but in our case, population density has a negative and significant impact on the variable of interest. To account for potential heterogeneity and cyclical or external variables that could bias the estimates, we include both country-fixed effects and time-fixed effects in all regressions. However, the goodness-of-fit indicator, R^2, shows very high values, indicating that the model specification is correct. In other words, our models are well-suited to the data.

In Table 2.4, we estimate our nexus using the Fixed Effect (FE) estimator with clustering standard errors at country level in order to deal with the presence of group-wise heteroskedasticity (see for instance Lee & Peterson, 2000).

We use the same specification as aforementioned, distinguishing between six alternative regressions in which all control variables are included, meaning that the primary explanatory variables (i.e., financial development) are the only ones that differ. As shown in Table 2.4, the number of credit unions and cooperative

bank branches per 100,000 adults and per 1000 km^2 are no longer significant when taken into account separately (regressions (1) and (4) respectively), while the number of commercial bank branches per 100,000 adults and per 1000 km^2 (regressions (2) and (5), respectively) are still significant.

Regressions (3) and (6) require more consideration, as in (3) the number of credit unions and cooperative and commercial bank branches per 100,000 adults is considered simultaneously, and in (6) the number of credit unions and cooperative and commercial banks per 1000 km^2. When the two types of banks are considered separately, the role of cooperative banks is partly "overshadowed" by the systemic action of commercial banks. The latter dominate in terms of credit volumes, capitalization, and market coverage. However, when the two variables are considered simultaneously, a complementary effect emerges. In fact, commercial banks operate mainly in large-scale financing and riskier projects, while cooperative banks operate in the relational, local, and proximity credit segment. In this context, the joint presence of the two banking models strengthens the local financial ecosystem and also makes the contribution of cooperatives to the creation of new businesses statistically visible (Boot & Thakor, 2008; Petersen & Rajan, 1995). According to the OLS results, both explanatory variables under investigation are significant; however, in both regressions, the number of credit union and cooperative bank branches is less significant than that of commercial banks. This because, firstly, commercial banks have larger capital bases, greater access to capital markets, and greater funding capacity. This allows them to finance a larger number of larger-scale business projects. They can also diversify risk at national and international level, taking on a greater risk propensity than cooperatives. In contrast, cooperative banks operate on a mutualistic and territorial basis, prioritizing stability, local roots, and support for their communities. This model provides strong support for micro-enterprises but limits their ability to finance capital-intensive, innovative, or high-risk projects (DeYoung et al., 1998; King & Levine, 1993a). In addition, regulatory constraints, stricter governance structures, and the absence of strong incentives to maximize profits reduce their aggressiveness in the credit market. Finally, in more financially complex national contexts, commercial banks tend to be the main intermediaries for public financing programs, European funds,

and subsidized credit lines for businesses. Cooperative banks, while playing an important role in financial inclusion, remain more marginal in large-scale financing processes (Hesse & Čihák, 2007; McKillop & Wilson, 2010).

Regarding the control variables, the negative impact of population density (regression (6)), the lack of an effect of population education (regressions (3) and (6)), and the positive and significant impact of GDP on entrepreneurship are all confirmed. However, in contrast to the OLS estimates, the negative, albeit non-significant, impact of government final consumption expenditure (regressions (3) and (6)) now appears to also emerge. An expansion in current public spending exerts inflationary pressures, especially when the economy is operating close to full capacity. Rising inflation prompts monetary authorities to adopt restrictive policies by raising interest rates. Higher rates translate into higher borrowing costs, reducing the economic attractiveness of debt for business purposes and discouraging the start-up of new businesses, which are structurally more sensitive to credit conditions (Alesina et al., 2002; Barro, 1991).

Table 2.4 Entrepreneurship and financial development: Full sample (FE Regression)

Regressors	(1)	(2)	(3)	(4)	(5)	(6)
CB_AD	0.287		0.311			
	[0.215]		[0.182]*			
COMM_AD		0.699	0.730			
		[0.241]***	[0.221]***			
CB_KM2				0.293		0.320
				[0.219]		[0.183]*
COMM_KM2					0.706	0.741
					[0.243]***	[0.223]***
GDP	1.048	0.746	0.840	1.045	0.747	0.838
	[0.478]**	[0.368]**	[0.389]**	[0.476]**	[0.364]**	[0.382]**
OPENNESS	0.153	−0.013	0.045	0.157	−0.008	0.054
	[0.242]	[0.190]	[0.203]	[0.244]	[0.189]	[0.204]
EDUCATION	1.227	0.647	0.370	1.228	0.659	0.378
	[0.540]**	[0.496]	[0.473]	[0.541]**	[0.493]	[0.473]
GOV_CONS	−0.200	−0.363	−0.298	−0.199	−0.378	−0.315
	[0.332]	[0.226]	[0.176]*	[0.329]	[0.224]*	[0.171]*
TAXES	−0.304	0.154	−0.073	−0.311	0.153	−0.083
	[0.339]	[0.202]	[0.269]	[0.343]	[0.203]	[0.272]
POP_DENS	0.673	−0.127	−1.057	0.323	−0.921	−2.284
	[1.453]	[1.464]	[1.086]	[1.280]	[1.490]	[1.157]*
TIME FE	YES	YES	YES	YES	YES	YES
HAUSMAN (p)	0.000	0.000	0.000	0.000	0.000	0.000
R^2	0.429	0.476	0.527	0.430	0.479	0.532
N	387	382	382	387	382	382

Standard errors are clustered at country level; dependent variable: number of new business registrations per 1000 people aged 15–64 (BUSINESS); all variables are taken in natural logarithms; N: number of observations; * $p<0.1$; ** $p<0.05$; *** $p<0.01$

Source: author's elaboration

From the point of view of expectations, a high incidence of current public spending can also fuel fears among potential entrepreneurs of future restrictive fiscal measures, such as tax increases necessary to rebalance public accounts. The expectation of a higher future tax burden reduces the expected profitability of business projects and reinforces a wait-and-see attitude, slowing down investment decisions (Alesina et al., 2002). Finally, an expansion of public spending can lead to a distortion in the allocation of resources, favoring protected sectors or those linked to public demand at the expense of private market-oriented entrepreneurial

activities. This reduces the competitive dynamism of the system and limits incentives for innovation and self-employment (Devarajan et al., 1996).

2.5.3 Addressing Endogeneity: IV-H Regression

The main threat to the accurate estimation of the relationship between entrepreneurship and financial development comes from the probability of endogeneity due to omitted variables, reverse causality or measurement errors, which is a major shortcoming of OLS and FE approaches.

In terms of application, Instrumental Variables Estimation using Heteroskedasticity-Based Instruments (IV-H) is particularly relevant to solve these classes of problems. First, it allows for the mitigation of omitted variable bias when unobserved factors simultaneously influence both the outcome and the explanatory regressor (Greene, 2000; Wooldridge, 2002). In this sense, places may have higher entrepreneurial density for reasons other than financial development. Second, IV-H addresses problems of simultaneity or reverse causality, which arise when the explanatory variable is influenced - either totally or partially - by the dependent variable. In such circumstances, the direction of causality is ambiguous, and the estimated model does not isolate the unidirectional effect of the explanatory variable on the dependent variable (Greene, 2000; Wooldridge, 2002). Indeed, financial development has an impact on entrepreneurship, but the reverse can also occur. For example, we predict that increased entrepreneurship has an impact on financial development, such as through increased demand for loans to encourage new business formation (implying greater financial depth) and other financial services (implying greater financial access). Third, IV-H can correct for measurement error bias in the regressor, avoiding the attenuation phenomenon that typically characterizes OLS (Greene, 2000). In each of these cases, identification derives from the use of instruments that generate a component of variation in the regressor that is plausibly uncorrelated with the unobserved shocks that directly influence the outcome (Wooldridge, 2002; Greene, 2000).

The benefits of the instrumental variables method are subject to two conditions of instrument validity being met: (i) relevance, i.e., a statistically and substantively significant correlation between the instrument and the endogenous regressor; and

(ii) exogeneity (or exclusion restriction), whereby the instrument influences the outcome exclusively through the regressor of interest and is uncorrelated with the structural error term (Greene, 2000; Wooldridge, 2002). In an overidentified framework, these assumptions can be partially investigated through diagnostic tests, while remaining largely based on economic and institutional arguments about the plausibility of the proposed causal channel (Greene, 2000; Wooldridge, 2002).

From an inference perspective, adopting the instrumental variables method involves a trade-off between reducing bias and a possible increase in the variance of estimates. The empirical validity of an instrumental variables strategy also depends on the strength of the instruments. In formal terms, an instrument is informationally adequate when it is sufficiently correlated with the endogenous regressor conditional on exogenous controls. In the presence of strong instruments, the estimator tends to show sampling behavior consistent with its asymptotic properties, with relatively low variance and more reliable standard inference (Wooldridge, 2002; Greene, 2000). Conversely, the presence of weak instruments - i.e., instruments that are only weakly correlated with the endogenous regressor - leads to: (i) inaccurate estimates; (ii) bias in finite samples that can bring the IV closer to the OLS results; and (iii) distortions in the size of conventional tests and in the coverage of confidence intervals (Staiger & Stock, 1994). Therefore, the instrumental variables approach is a powerful solution to endogeneity problems, but its empirical credibility depends critically on the quality of the instruments and the strength of the identification argument that justifies them (Greene, 2000; Wooldridge, 2002).

We use the instrumental variables (IV) approach developed by Lewbel (2012). This method is particularly useful when external sound instruments are not accessible (see Arcand et al., 2015; Dutta & Meierrieks, 2021). Importantly, it allows the creation of multiple instruments simultaneously (equivalent to the number of parameters related to the underlying regression model). This technique is unique in that it allows for the identification of structural parameters in regression models with endogenous or incorrectly measured regressors in the absence of typical identifying information such as external instruments or repeated measures.

Specifically, this estimator uses heteroskedasticity to identify and estimate

mismeasured and endogenous regressor models. This procedure can be formalized as follows:

$$\ln(BUSINESS)_{i,t} = \beta_0 + \beta_1 \ln(FD)_{i,t} + \sum \varphi \ln(Z)_{i,t} + \gamma_i + \tau_t + \varepsilon_{i,t.2} \quad (2.2)$$

$$\ln(FD)_{i,t} = \beta_0 + \sum \omega \ln(Z)_{i,t} + \gamma_i + \tau_t + \varepsilon_{i,t.3} \quad (2.3)$$

Where eq. (2.2) represents the second-stage regression and eq. (2.3) is the first-stage regression, whereas Z are utilized as internal instruments to address the issue of endogeneity.

In general, this technique is identified when regressors are uncorrelated with the product of heteroskedastic errors, which is a property of many models where error correlations are caused by an unobserved common factor. Then, here, we assume the moments $Cov(Z, \varepsilon_2 \varepsilon_3) = 0$as instruments.

Essentially, the presence of heteroskedasticity in regression residuals is used to construct a set of internal instruments capable of identifying causal linkages even when sufficiently strong and believable external instruments are not available (Rigobon, 2003; Lewbel, 2012). In other words, it avoids the methodological and conceptual challenges that are commonly associated with the identification and justification of external instruments.

As usual, the results of Hansen's test for instrument validity (over-identification constraints) are also presented; as is well known, failure to reject the null hypothesis of joint validity of the instruments means that the chosen instrument set is exogenous. To assess the weakness of the instruments, the first-stage F-statistic is also presented; an F-statistic above 10 indicates a sufficiently powerful combination of instruments. Finally, C statistics are provided.

2.5.4 IV-H: Baseline Empirical Findings

In Table 2.5, we use the IV estimator suggested by Lewbel (2012) to analyze the previously described nexus. Unlike prior approaches, it allows us to address the endogeneity issue that exists between financial development and entrepreneurship. As previously stated, we distinguish six different specifications. In regression (1),

the impact of the number of branches per 100,000 adults is positive and statistically significant, just like the impact of GDP and openness to international trade, implying that as the distribution of credit unions and cooperative banks within society increases (particularly among people of working age), so does entrepreneurship, and thus the number of firms within the considered territory (Dutta & Meierrieks, 2021; Beck & Demirguc-Kunt, 2006, 2008; Acs & Audretsch, 1990; Aghion & Howitt, 1990).

This is due to credit unions and cooperative banks' governance structure, which causes them to be closely connected with society and the region, as well as the fact that their activities are limited to specific territorial boundaries. Since the model is expressed in logarithms, the estimated coefficients can be interpreted as elasticities. In particular, a 1% increase in the number of cooperative bank branches is associated with a 0.508% increase in entrepreneurship. This effect is obviously amplified if the territory is richer and there is greater openness to international trade. In fact, countries with a higher gross domestic product (GDP) have a higher frequency of new business registrations. A 1% increase in GDP is associated with an increase in entrepreneurship of approximately 1,069%. This phenomenon is rooted in a complex interaction of economic, institutional, social, and cultural factors. A higher Gross Domestic Product (GDP) implies a greater concentration of financial resources, both in the public and private sectors. These resources can be mobilized to support entrepreneurial activity through credit instruments, venture capital, and soft loans. That significantly reduces barriers to accessing capital for start-ups and new business ventures (Acs & Audretsch, 1990; Aghion & Howitt, 1990). High-income economies also have more structured and stable financial systems that offer diversified products and services. These systems can respond to a variety of business needs, from supporting micro-enterprises in the start-up phase to financing technology-intensive projects. In addition, an economically advanced infrastructure, both tangible and intangible, can provide know-how and technology transfer. The contexts create more efficient, transparent, and digitized public and administrative institutions. This allows them to develop simplified procedures that reduce bureaucratic costs, business risks, and start-up times. From a macroeconomic perspective, countries with high GDP also have larger, more diversified and

sophisticated domestic markets. In this context, we can also observe a structural transformation of domestic demand. Higher GDP levels also indicate more diversified and sophisticated consumption patterns. As income rises, consumers tend to demand higher-quality goods, more differentiated products, and increasingly personalized services. This shift reflects a transition from standardized mass consumption to heterogeneous, niche-oriented demand structures. The fragmentation of demand into multiple segments opens up opportunities for new firms to enter the market, targeting niches not fully served by incumbents. In this environment, entrepreneurship is driven not only by necessity, but also by opportunity. Indeed, firms exploit unmet or emerging consumer needs through innovation and product differentiation. This mechanism is consistent with Schumpeterian theories of innovation, according to which entrepreneurs act as agents of change by introducing new product and service combinations. In high-income economies, competitive pressure is based less on price and more on innovation and quality. Furthermore, at a cultural level, entrepreneurial activity in advanced economies is often socially appreciated and supported by collaborative ecosystems (Abler, 2010). In fact, the presence of business accelerators and targeted public policies contribute significantly to promoting self-employment (and thus entrepreneurship). Business accelerators are structured programs designed to assist early-stage startups through mentoring, management training, access to professional networks and financial resources. These mechanisms improve the quality of entrepreneurial projects, increase their likelihood of survival and growth by reducing information asymmetries between entrepreneurs and investors.

Among the best-known international examples are Y Combinator and Techstars, which have played a key role in the growth of innovative startups. Among European initiatives, on the other hand, we can mention Startupbootcamp and PoliHub, which promote local entrepreneurial ecosystems. Y Combinator, for example, has developed a highly structured model aimed at rapidly scaling early-stage startups. Its program typically lasts about three months and combines seed funding, intensive mentoring, and ongoing interaction with experienced entrepreneurs. Startups admitted to the program receive seed capital in exchange for equity. Additionally, they participate in an environment where they refine their business models and

improve product-market fit. A key feature of Y Combinator is the so-called "Demo Day," during which startups present their projects to a broad audience of venture capitalists and institutional investors. This mechanism significantly reduces financial friction and facilitates access to follow-up funding. Notably, companies such as Airbnb, Dropbox, and Stripe have emerged from this ecosystem, demonstrating the accelerator's ability to transform innovative ideas into globally scalable businesses.

Startupbootcamp adopts a similar, albeit more geographically diverse, approach. Unlike Y Combinator, it operates through sector-specific programs (e.g., fintech, energy) and collaborates closely with large corporations, financial institutions, and public stakeholders. This model allows startups to benefit not only from mentoring and initial funding, but also from direct access to industry partners and potential customers. In many cases, startups are integrated into existing value chains, facilitating technology transfer and market entry. Furthermore, Startupbootcamp frequently collaborates with local authorities and innovation agencies, contributing to the development of regional entrepreneurial ecosystems.

These examples highlight two complementary channels through which accelerators support entrepreneurship. On the one hand, they reduce information asymmetries and improve capital allocation by certifying the quality of startups. On the other hand, they provide relational capital - networks, partnerships and market access - essential for the growth and survival of new businesses. Consequently, accelerators not only increase the number of entrepreneurial initiatives, but also improve their quality and scalability. In fact these strengthen the virtuous cycle of innovation, competitiveness and value creation.

At the same time, public policies aimed at encouraging self-employment operate through multiple complementary channels. First, tax incentives - such as simplified tax regimes and reduced taxation - lower the costs of entering the entrepreneurial market. This is the case of the Italian flat-rate tax regime and the UK's Enterprise Investment Scheme, which stimulate private investment in startups. Second, access to finance is facilitated by public guarantees, subsidized loans, and development banks, such as Bpifrance and KfW, which reduce credit constraints for new entrepreneurs. Third, training and human capital development policies - such as

Erasmus for young entrepreneurs - improve managerial and entrepreneurial skills. Finally, regulatory simplification and administrative reforms reduce bureaucratic barriers, shortening the time and costs required to start a business (Adl, 2025). It follows that the relationship between high GDP and entrepreneurship is not accidental, but the result of a set of structural conditions that facilitate and reward business risk. These makes the creation of new economic activities not only possible, but also attractive and sustainable over time (Munyo & Veiga, 2024). From the point of view of opening up to foreign trade, an increase in the number of registrations of new companies can be observed. First, openness to international trade expands the market accessible to firms, extending potential demand beyond national borders (Helpman et al., 2004). This creates new profit opportunities by increasing the number of consumers and market segments that can be served. This also lowers barriers to entry for export-oriented firms. Second, access to international markets allows firms to exploit economies of scale more efficiently. This mechanism is particularly relevant for innovative and technological startups, as they face high fixed costs in the initial stages of production. By operating in such markets, these firms can spread that kind of costs across larger production, improving their competitiveness and increasing their chances of survival (Krugman, 1980). Third, trade openness intensifies competitive pressure and generates a selection effect among firms. According to the heterogeneous firm model developed by Melitz in 2003, only the most productive firms are able to access export markets, while the less efficient ones exit. This reallocation of resources toward the most productive firms increases aggregate productivity and fosters opportunity-based entrepreneurship. In this context, new firms are incentivized to enter the market with more innovative and efficient business models. In that way they are able to compete globally. Furthermore, trade openness facilitates the diffusion of knowledge and technology between countries. As Grossman and Helpman (1991) argued, international trade serves as a channel for knowledge transmission. That enable firms to learn from foreign technologies, management practices and production processes. This exposure to global markets increases innovation capacity and stimulates the creation of new firms, particularly in high-tech and knowledge-intensive sectors. The interaction between trade openness and innovation has been

further highlighted in the Schumpeterian growth framework (Aghion et al., 2005). Indeed, in this case we find the "flight-from-competition" effect, as increased competition in international markets can stimulate firms to innovate to escape it. From a regulatory and institutional perspective, countries that are more open to trade tend to have more transparent and efficient regulatory regimes. These factors, together with streamlined customs systems, reduce the costs and uncertainties associated with doing business. So, for the entrepreneurs is easier and more attractive create new businesses. Greater integration with the global economy intensifies the flow of foreign capital and the presence of international investors. The latter finance local start-ups capable of competing on global markets, thus facilitating the raising of financial resources for new businesses. Finally, in contexts of high commercial openness, a more dynamic entrepreneurial culture often spreads. In such an environment, start-ups are perceived as a natural and proactive response to the multitude of opportunities offered by internationalization (Fujita et al., 2001). This helps to strengthen the productive fabric and diversify the national economy. This last variable is highly significant in all six specifications, implying that it has a critical impact on entrepreneurship. A 1 percentage point increase in trade openness is associated with a rise in entrepreneurship ranging from 0.76% to 1.04%, depending on the specification. According to regression (2), while trade openness is a robust and positive predictor of entrepreneurship, the number of commercial bank branches per 100,000 persons is positive but not statistically significant.

The latter result, however, is completely inverted in regression (3), where the number of credit unions and cooperative and commercial bank branches per 100,000 adults is both positive and statistically significant. Specifically, a 1% increase in the number of cooperative bank branches leads to a 0.495% increase in entrepreneurial activity, while a 1% increase in commercial bank branches is associated with a 0.853% increase. This implies that the number of registered businesses increases with the prevalence of both kinds of banks in society. Therefore, in addition to the previously mentioned effects of credit unions and cooperative bank branches, we also have the impact of commercial banks, which significantly foster the growth of entrepreneurship because of their larger scale and increased risk-taking capacity (Beck & Demirguc-Kunt, 2006, 2008).

Additionally, we can confirm the positive impact of trade openness on entrepreneurship (specifically a 1% increase in the trade-to-GDP ratio is associated with an increase of approximately 0.893% in entrepreneurship), but population density has a negative and statistically significant impact (a 1% increase in population density is associated with a decrease of 2.042% in entrepreneurship). Countries with higher population density often have fewer new business registrations. This dynamic can be explained by a number of economic, spatial and social factors. First, high population density is typically associated with significantly higher startup and operating costs. This is reflected in commercial real estate prices, rental costs, and land values. These factors increase fixed entry costs, thus raising financial barriers for potential entrepreneurs. Consequently, individuals may be discouraged from undertaking entrepreneurial activities due to the need for higher initial capital. From a theoretical perspective, this mechanism is consistent with Hopenhayn's (1992) "Model of Firm Dynamics", where higher fixed costs reduce entry rates and generate a selection effect among firms. Only entrepreneurs with sufficient financial resources or highly scalable business models are able to enter dense urban markets. Conversely, smaller or less capitalized firms are more likely to be excluded. However, the impact of these costs is not uniform across different types of entrepreneurial activity. Technology-intensive startups are better able to withstand higher initial costs. This is because they rely on scalable business models and benefit from external sources of financing such as venture capital. Furthermore, they tend to benefit more from agglomeration economies, including access to skilled labor and innovation networks. In contrast, self-employed businesses typically operate on a smaller scale, rely more heavily on internal funding and face more stringent financial constraints. Consequently, they are more sensitive to entry costs and are more likely to be discouraged in high-cost environments. This cost-related mechanism must also be interpreted in relation to the benefits associated with urban agglomeration. According to the literature (Marshall, 1890; Friedmann, 1970), densely populated areas offer advantages in terms of knowledge spillovers, access to skilled labor and proximity to stakeholders. These factors can increase productivity and innovation, partially offsetting the negative impact of higher costs.

Added to this is the bureaucratic and administrative complexity that often characterizes urbanized and densely populated areas. Regulations regarding safety, the environment, mobility and urban planning are more complex here. All of this increases the time and cost of starting new businesses. From a social perspective, densely populated areas present bad quality of life. We recognize traffic, pollution, congestion of public services, and reduced availability of productive space. These factors can discourage entrepreneurial initiatives, especially those requiring large physical areas or favorable environmental conditions (Fujita et al., 1999). Finally, fierce competition for productive resources - skilled labour, specialised human capital, logistical services - in high-density areas can lead to higher wage. Furthermore, this limits the economic viability of starting new businesses and pushing entrepreneurs to prefer less congested territories. In these places the costs are lower and market opportunities more accessible. Additionally, if a bank receives too many loan applications, it must decide who to lend to and who not to. Consequently, loan granting is more selective, based not only on the quality of the project but also on the collateral a person can provide (Glaeser et al., 2015; Audretsch & Keilbach, 2007). The same results are found for regressions (4), (5), and (6), but this time they are connected to the number of credit unions and cooperative and commercial bank branches per 1000 km^2. As a result, we may conclude that the distribution of banks within the area and society has an important influence in the growth of entrepreneurship (Dutta & Meierrieks, 2021; Beck & Demirguc-Kunt, 2006, 2008).

Table 2.5 Entrepreneurship and financial development: Full sample (IV-H Regression)

Regressors	(1)	(2)	(3)	(4)	(5)	(6)
CB_AD	0.508		0.495			
	[0.212]**		[0.158]***			
COMM_AD		0.803	0.853			
		[0.451]*	[0.214]***			
CB_KM2				0.524		0.513
				[0.227]**		[0.166]***
COMM_KM2					0.803	0.846
					[0.439]*	[0.198]***
GDP	1.069	0.577	0.143	1.075	0.606	0.186
	[0.271]***	[0.545]	[0.358]	[0.269]***	[0.519]	[0.337]
OPENNESS	1.042	0.765	0.893	1.029	0.761	0.879
	[0.276]***	[0.274]***	[0.257]***	[0.272]***	[0.273]***	[0.252]***
EDUCATION	0.192	−0.033	0.067	0.201	−0.025	0.085
	[0.134]	[0.123]	[0.128]	[0.137]	[0.121]	[0.129]
GOV_CONS	0.068	−0.240	−0.174	0.071	−0.256	−0.185
	[0.230]	[0.304]	[0.226]	[0.230]	[0.306]	[0.223]
TAXES	−0.375	0.167	−0.143	−0.392	0.166	−0.163
	[0.232]	[0.191]	[0.196]	[0.239]	[0.188]	[0.197]
POP_DENS	−0.493	−0.528	−2.042	−1.141	−1.425	−3.612
	[0.688]	[1.068]	[0.715]***	[0.823]	[1.432]	[0.855]***
TIME FE	YES	YES	YES	YES	YES	YES
HANSEN (p)	0.483	0.720	0.555	0.651	0.682	0.512
C-STAT (p)	0.038	0.900	0.515	0.220	0.811	0.494
F-STAT (1st STAGE CB_AD)	14.27		9.57			
F-STAT (1st STAGE COMM_AD)		36.96	10.24			
F-STAT (1st STAGE CB_KM2)				14.69		10.21
F-STAT (1st STAGE COMM_KM2)					38.79	12.59
R^2	0.416	0.402	0.458	0.417	0.405	0.465
N	364	360	360	364	360	360

Standard errors are clustered at country level; dependent variable: number of new business registrations per 1000 people aged 15–64 (BUSINESS); all variables are taken in natural logarithms; N: number of observations; * $p<0.1$; ** $p<0.05$; *** $p<0.01$

Source: author's elaboration

The estimated impact of financial development on entrepreneurship is marginally greater in the IV setting than it is in the non-IV one. What's more, IV diagnoses are nearly always reliable. Indeed, the Hansen test confirms the validity of the instruments used (p values greater than 0.10), while the F-statistic rules out instrument weakness (values greater than 10 threshold points, as a rule of thumb). These two diagnostic tests would show that there are no endogeneity issues with the IV estimator (Rigobon 2003; Lewbel 2012).

2.6 Further Robustness Analyses

In what follows, we propose a series of sensitivity analyses with the goal of corroborating our empirical findings, giving credit to our estimation and highlighting the validity of our empirical technique.

2.6.1 IV-H. The Role of Wealth

In Table 2.6, we employ the previously mentioned IV estimator in order to control for the endogeneity issue but takes into account low-income countries. We assume that the level of entrepreneurship in less developed countries is influenced by financial development, and that the heterogeneity of our sample shapes the relationship being examined.

In all six specifications, the key explanatory variables (i.e., financial development) are always positive and statistically significant. This leads us to the conclusion that the greater the distribution of credit unions and cooperative and commercial bank branches throughout the area and among individuals, the greater the rate of entrepreneurship in a given territory, i.e., the number of new business registrations. Credit unions and cooperative and commercial bank branches have an impact on entrepreneurship for two distinct reasons (Dutta & Meierrieks, 2021; Beck & Demirguc-Kunt, 2006, 2008). Credit unions and cooperative bank branches have a governance structure that makes them very much linked to the territory and to society; this characteristic is especially important if their activity is developed in

low-income countries because being more linked to society makes them more likely to grant loans for the establishment of new businesses. Commercial bank branches, on the other hand, are significantly larger than credit unions and cooperative bank branches and have a broader range of activities. This category of bank can take more risks than a cooperative bank and lend more money (Saunders et al., 2022; Mishkin & Eakins, 2018). Regressions (3) and (6) show that their effect is bigger than that of credit unions and cooperative bank branches. A 1% increase in the number of commercial bank branches leads to an increase of 1.035% in entrepreneurial activity while an increase of 1% of cooperative banks bring to an increase of 0.518%. Moreover, the magnitude of these coefficients appears larger respect Table 2.5. This difference can be explained by the fact that now we are focusing on a more specific subsample (e.g., low-income countries), where financial constraints are more binding and the marginal impact of banking development on entrepreneurship is stronger. In such contexts, the expansion of both commercial and cooperative banking networks has a more pronounced effect on business creation. This is due to the lower initial level of financial development and the greater sensitivity of entrepreneurial activity to improvements in access to credit. In the regressions considered, commercial banks have a greater impact than credit unions due to structural, financial and institutional factors. These affect both the supply of credit and the functioning of local markets. In fact in less developed economies the financial system is generally less diversified than in high-income countries. In this context, commercial banks are often the main actors able to provide formalised credit and structured financial instruments. This thanks to their greater asset size and fund-raising capacity. In contrast, cooperative banks are weaker in terms of capital and operations. They have a limited capacity to take high risks and finance start-ups without solid collateral, a condition typical of low-income contexts. Furthermore, in low-income countries, commercial banks tend to be favored by public economic development policies. This also occurs through state or international microcredit programs and concessional credit lines dedicated to the private sector (Meh, 2005). Such funds are more often channeled through large banking institutions rather than through the cooperative system, which is often considered too fragmented or informalized. Commercial banks, thanks to their branch networks, have more

advanced digital and risk management tools. These tools allow them to reach even remote or rural areas, offering dedicated service packages to emerging small businesses. Doing so increases access to credit and encourages the registration of new businesses. As regard the credit demand, entrepreneurs in low-income countries often prefer to turn to commercial banks. These institutions offer more diversified financial products, such as lines of credit, leasing and medium- to long-term loans. Furthermore, they are perceived as more solid, reliable and more integrated into national and international financial systems (Aghion et al., 2010; Banerjee & Duflo, 2014). Cooperative banks, on the other hand, are more oriented towards satisfying traditional and small-value financial needs. Their credit is often related to household consumption or the agricultural sector, tend to have slower structured procedures and a limited product range. It is also important to note the positive significance of openness to international trade. A 1 percentage point increase in trade openness is associated with a rise in entrepreneurship ranging from 0.67% to 1.26%. This occurs because access to new markets provides opportunities to export to larger and more profitable foreign markets, resulting in the emergence of new enterprises (Petersen & Rajan, 1995). According to the controls, we find the following results. Trade openness can assist local firms create additional money and promote economic growth (Fujita et al., 2001).

Table 2.6 Entrepreneurship and financial development: Low income (IV-H Regression)

Regressors	(1)	(2)	(3)	(4)	(5)	(6)
CB_AD	0.602		0.518			
	[0.169]***		[0.128]***			
COMM_AD		1.267	1.035			
		[0.381]***	[0.243]***			
CB_KM2				0.614		0.567
				[0.170]***		[0.139]***
COMM_KM2					1.264	1.031
					[0.380]***	[0.237]***
GDP	0.947	0.176	−0.190	1.011	0.317	−0.060
	[0.467]**	[0.607]	[0.536]	[0.439]**	[0.565]	[0.504]
OPENNESS	1.262	0.688	0.948	1.260	0.679	0.953
	[0.326]***	[0.375]*	[0.307]***	[0.320]***	[0.379]*	[0.305]***
EDUCATION	1.243	0.461	0.839	1.261	0.481	0.894
	[0.324]***	[0.363]	[0.316]***	[0.319]***	[0.359]	[0.312]***
GOV_CONS	−0.045	0.145	0.342	−0.003	0.101	0.363
	[0.439]	[0.491]	[0.411]	[0.446]	[0.484]	[0.406]
TAXES	−0.275	−0.022	−0.440	−0.287	−0.034	−0.497
	[0.264]	[0.276]	[0.214]**	[0.266]	[0.275]	[0.223]**
POP_DENS	−2.333	0.023	−2.317	−3.157	−1.365	−4.373
	[1.024]**	[1.113]	[0.946]**	[1.143]***	[1.280]	[1.114]***
TIME FE	YES	YES	YES	YES	YES	YES
HANSEN (p)	0.576	0.845	0.500	0.576	0.852	0.500
C-STAT (p)	0.422	0.358	0.456	0.977	0.623	0.534
F-STAT (1st STAGE CB_AD)	8.22		6.73			
F-STAT (1st STAGE COMM_AD)		29.58	53.60			
F-STAT (1st STAGE CB_KM2)	7.78					6.23
F-STAT (1st STAGE COMM_KM2)			28.74			54.07
R^2	0.585	0.589	0.675	0.594	0.591	0.685
N	173	169	169	173	169	169

Standard errors are clustered at country level; dependent variable: number of new business registrations per 1000 people aged 15–64 (BUSINESS); all variables are taken in natural logarithms; N: number of observations; * $p<0.1$; ** $p<0.05$; *** $p<0.01$

Source: author's elaboration

The population's educational level has a positive and significant effect on entrepreneurship - 1% increase of educational level leads to an increase of entrpreneurship of approximatively 0.8% (Lucas, 1988; Cohen & Levinthal, 1990; Romer, 1990). In this regard, the role of human capital in shaping individuals' ability

to identify and exploit new economic opportunities is recognized. Higher levels of education enable individuals to better perceive unmet needs and emerging market trends by improving their cognitive and analytical skills. This ability is particularly relevant in modern economies characterized by rapid technological change and evolving consumer preferences. In this context, new business opportunities often arise from the ability to reinterpret existing knowledge and apply it innovatively. Furthermore, education fosters innovation by increasing individuals' ability to develop new products, processes and services. Highly educated individuals are more likely to engage in opportunity-driven entrepreneurial activities, particularly in knowledge-intensive and technology-based sectors. This is consistent with the concept of absorptive capacity (Cohen & Levinthal, 1990), according to which individuals with higher levels of human capital are better able to acquire, process and exploit external knowledge, thus facilitating the creation of businesses. Education also helps to reduce the uncertainty associated with entrepreneurial activity. Individuals with higher levels of education tend to have better managerial and organizational skills. They are also more skilled at assessing risks and effectively planning business strategies. This reduces barriers to entry and increases the likelihood of success.

Taxes have a negative and significant value in regressions (3) and (6) (specifically, a one percentage point increase in the tax burden on firms is associated with a reduction in entrepreneurial activity of approximately 0.4%). This dynamic is based on economic, fiscal and psychological reasons that affect the propensity to be entrepreneur. First, a higher tax burden directly reduces the expected profitability of new business. A significant share of the profits generated is absorbed by the tax system through corporate income taxes, social contributions and local taxes. This perspective reduces the economic incentive to start a business, especially for small and medium-sized enterprises. Such businesses operate with tighter profit margins and are less able to plan sophisticated tax strategies. Furthermore, a high tax burden is often associated with greater regulatory and bureaucratic complexity, with additional administrative burdens. The regulatory framework increases fixed and indirect management costs for new businesses, which find themselves having to

allocate financial resources to tax compliance. These resources are thus diverted from productive activities. From a business risk perspective, a high tax regime raises the financial break-even point required to make the business economically viable. Consequently, the initial investment become less attractive and daunting (Bruce et al., 2020). This is particularly true for emerging entrepreneurs and innovative startups, which face an early stage characterized by high costs and uncertain profits. Finally, from a psychological and cultural perspective, contexts characterized by high tax pressure can create an unfavorable climate for private enterprise. It fuels a perception of institutional hostility towards businesses. This perception reinforces offshoring behavior. Many potential entrepreneurs may, in fact, prefer to renounce opening new businesses, postpone them, or relocate them to more tax-competitive countries. A particularly important factor in this context is the increasing mobility of capital, which makes it easier to choose alternative locations (Pratama, 2023). Finally, population density has a negative effect in all six regressions (a 1% increase in population density leads to a 2–4% decrease in entrepreneurship). This is due to the fact that a high population density increases the demand for loans from the general public, which forces banks to be more selective in the collateral they require and the caliber of the project they offer for the launch of a new business (Glaeser et al., 2015; Audretsch & Keilbach, 2007; Fujita et al., 1999). Again, the various tests done on the regressions are listed at the bottom of the table. Hansen test and *F*-statistic are confirmed in both cases.

2.6.2 IV-H. The Role of Institutional Quality

In Table 2.7, as a sensitivity analysis, we apply the IV approach to the whole sample but include another key factor, i.e., institutional quality (WB – Source: World Bank Governance Indicators Dataset, developed by Kaufmann et al., 2009). Since the four explanatory variables (financial development) that are taken into consideration are consistently positive and statistically significant when examining all six specifications, we conclude that the social and territorial distribution of credit unions and cooperative and commercial bank branches significantly influences the growth in entrepreneurship (Dutta & Meierrieks, 2021; Beck & Demirguc-Kunt,

2006, 2008. According to the control variables, we find no evidence of the impact of GDP on business density, while we confirm the positive and statistically significant impact of openness to international trade and the negative and statistically significant impact of population density (regressions 3 and 6) (Fujita et al., 2001). In particular, a 1% increase in the number of cooperative bank branches is associated with an increase in entrepreneurial activity of approximately 0.44–0.48%, while a similar increase in commercial bank branches leads to a larger effect, ranging from 0.72% to 0.780%. Regard trade openness, one percentage point increase is associated with a rise in entrepreneurship of about 0.72–0.99%. In contrast, population density shows a strong negative effect, with a 1% increase reducing entrepreneurial activity by approximately 1.61% to 3.12%. On the other hand, we can see that the composite indicator of institutional quality (WB) has a positive and statistically significant effect in all six specifications (1% improvement is associated with an increase in entrepreneurship of about 0.87% to 1.20%). This implies that the number of new company registrations rises in tandem with an improvement in a nation's institutional quality. When a country's institutions are strong, transparent and efficient, they provide a predictable and reliable regulatory environment. That reduces the level of risk perceived by entrepreneurs and, as a result, encourages the launch of new economic activities (Fomba et al., 2023). This happens for several reasons:

1) Clear, stable and consistent laws and regulations eliminate much of the uncertainty associated with business activity. In a well-structured regulatory environment, entrepreneurs know exactly what obligations they must comply with and what benefits they can obtain. They don't have the fear of sudden regulatory changes or arbitrary interpretations of the rules. This especially benefits start-ups, which do not have the resources to manage complex and changing regulatory scenarios (Chambers & Munemo, 2019).
2) An efficient public administration that provides better public services such as education and digital infrastructures speeds up bureaucratic procedures. That reduce the time and costs for registering a business, to obtain authorizations and managing tax. Furthermore, a quality education and training system guarantees the availability of qualified human capital, an

essential element for new businesses (Chambers & Munemo, 2017).

3) An efficient legal system ensures the protection of property rights and the enforcement of contracts, essential prerequisites for the functioning of market economies. In contexts where contracts are reliably enforced and disputes are resolved promptly, entrepreneurs face lower levels of uncertainty and risk, which encourages investment. This mechanism has been extensively expounded by Douglass North in 1991, who argued that well-defined and enforceable property rights are essential for economic development. When legal institutions are weak, entrepreneurs are exposed to risks such as expropriation, opportunistic behavior, corruption and lengthy legal proceedings. These factors increase transaction costs and reduce the expected returns from entrepreneurial activities. Furthermore, inefficient judicial systems can significantly delay the resolution of commercial disputes. Lengthy and uncertain legal procedures reduce firms' ability to operate effectively. This further increase business risk. Conversely, efficient legal systems strengthen trust between economic operators, facilitating contractual relationships, partnerships, and long-term investments.
4) A low level of corruption is associated with greater trust in institutions and a more transparent economic environment. In such environments, firms compete based on productivity, innovation, and the quality of products. Consequently, privileged access to political connections or informal networks is not relevant. Corruption is a hidden and distorting cost that acts as an informal tax on economic activity. Unlike formal taxation, however, these costs are uncertain and non-transparent. Consequently, corruption increases both the direct and indirect costs of starting and operating a business. Thus discouraging new entrepreneurs from entering the market. This mechanism is consistent with the findings of Chambers and Munemo (2019), who demonstrate that greater public integrity reduces barriers to entry and promotes fair competition. Corruption also distorts competitive dynamics by creating artificial barriers to entry. Firms with political connections can more easily obtain licenses, contracts or regulatory

advantages. More efficient but less connected firms are excluded. This leads to a misallocation of resources. In fact, less productive firms survive at the expense of more innovative ones, reducing overall economic efficiency and entrepreneurial dynamism. Corruption also increases uncertainty and business risk. In fact, administrative decisions become less predictable and more discretionary. This reduces the expected returns from entrepreneurial activity and discourages investment.

5) Finally, active citizenship and civil society help to create a cultural environment favorable to entrepreneurship. Citizen participation in public life and the spread of social capital foster the sharing of ideas, the dissemination of good practices and collective support for entrepreneurial initiatives. A high level of education and entrepreneurial culture improves people's ability to seize market opportunities and start innovative businesses. As a result, we can see a strengthening of the local productive fabric (Chowdhury et al., 2019).

Institutional quality therefore acts as a multiplier of opportunities for business. It reduces the transaction costs, increase legal certainty and creates favorable conditions for economic activity and free markets.

Hansen test and *F*-statistic are also confirmed.

Table 2.7 Entrepreneurship and financial development. The role of institutions (IV-H Regression)

Regressors	(1)	(2)	(3)	(4)	(5)	(6)
CB_AD	0.456		0.442			
	[0.197]**		[0.148]***			
COMM_AD		0.726	0.794			
		[0.402]*	[0.194]***			
CB_KM2				0.489		0.467
				[0.211]**		[0.157]***
COMM_KM2					0.736	0.801
					[0.388]*	[0.175]***
GDP	0.468	−0.195	−0.379	0.472	−0.180	−0.354
	[0.292]	[0.488]	[0.345]	[0.293]	[0.463]	[0.327]
OPENNESS	0.993	0.730	0.853	0.987	0.725	0.841
	[0.258]***	[0.246]***	[0.243]***	[0.255]***	[0.246]***	[0.239]***
EDUCATION	0.073	−0.166	−0.042	0.087	−0.160	−0.024
	[0.124]	[0.105]	[0.118]	[0.128]	[0.103]	[0.120]
GOV_CONS	−0.148	−0.492	−0.365	−0.139	−0.509	−0.377
	[0.220]	[0.283]*	[0.226]	[0.222]	[0.283]*	[0.222]*
TAXES	−0.153	0.402	0.063	−0.183	0.404	0.041
	[0.207]	[0.203]**	[0.192]	[0.215]	[0.200]**	[0.192]
POP_DENS	−0.156	−0.146	−1.607	−0.811	−0.985	−3.121
	[0.682]	[0.998]	[0.666]**	[0.819]	[1.310]	[0.784]***
WB	0.894	1.198	0.878	0.879	1.201	0.869
	[0.223]***	[0.210]***	[0.194]***	[0.231]***	[0.209]***	[0.194]***
TIME FE	YES	YES	YES	YES	YES	YES
HANSEN (p)	0.583	0.569	0.400	0.548	0.542	0.339
C-STAT (p)	0.049	0.960	0.538	0.050	0.823	0.424
F-STAT (1st STAGE CB_AD)	19.19		10.66			
F-STAT (1st STAGE COMM_AD)		39.60	12.90			
F-STAT (1st STAGE CB_KM2)				19.10		11.08
F-STAT (1st STAGE COMM_KM2)					37.20	13.39
R^2	0.468	0.483	0.511	0.465	0.486	0.515
N	364	360	360	364	360	360

Standard errors are clustered at country level; dependent variable: number of new business registrations per 1000 people aged 15–64 (BUSINESS); unlike to institutional quality indicator (WB), all remaining variables are taken in natural logarithms; N: number of observations; * $p<0.1$; ** $p<0.05$; *** $p<0.01$.

Source: author's elaboration

2.7 Conclusions and Policy Implications

From 2006 to 2020, we conducted an empirical study on the impact of financial development on entrepreneurship in 51 countries (developed and developing), using data from two major categories of financial intermediaries: commercial and credit unions and cooperative banks. Our contribution to the literature is to: (i) provide causal estimates of the effect of financial development on entrepreneurship using an instrumental variable approach that takes advantage of the heteroskedasticity of regression residuals; and (ii) consider a diversity context with two financial intermediaries coexisting. Basically, we provide answers to two critical research questions: Is financial development advantageous to the emergence of new businesses? Is banking diversity necessary for financial development and entrepreneurship?

Based on three distinct estimators (OLS, FE, and IV-H), the empirical evidence confirms the relevance of both financial intermediaries in supporting entrepreneurship, with commercial banks having a higher intensity than their counterparts.

In summary, our findings support Schumpeter's (1934) and others' findings that a functional banking sector can boost entrepreneurial activity at the national level. Indeed, financial development, for example, encourages entrepreneurship by alleviating liquidity limitations, lowering agency costs, and boosting risk and information management, resource allocation, and savings mobilization (Dutta & Meierrieks, 2021).

Entrepreneurship is a vital engine of economic growth and job creation (Stel et al., 2005), and as such, it necessitates a solid financial infrastructure in order to prosper. Our findings underscore the financial sector's critical role in the establishment and support of start-ups and, unlike other contributions, the adding value of the bank diversity. As a result, policymakers should make every effort to support financial innovation, working to improve access to international capital markets.

Financial innovation strengthens project selection and monitoring, savings mobilization, capital allocation, and risk management. By reducing information and transaction costs (e.g., through digital onboarding, improved credit assessment

technologies, and more efficient payment infrastructures), financial innovation can reduce credit rationing and alleviate liquidity constraints. These constraints disproportionately affect start-ups and young companies, which typically lack collateral and credit history. In addition, innovation broadens the range of financing arrangements and delivery channels.

Improved access to global markets, according to studies such as Chinn & Ito (2006), can promote investment and boost business growth. Better access to international capital markets broadens the range of financing services available to entrepreneurs and increases the availability of long-term resources. This allows for the use of alternative instruments to traditional bank credit, which are often better suited to high-risk ventures. Indeed, national financial systems may not be able to provide sufficient volumes and types of financing, especially in contexts characterized by limited domestic savings and banking concentration. Better access to global markets can stimulate investment and support business growth. This dynamic implies the need to reduce barriers to cross-border capital movements, while ensuring an institutional and regulatory environment capable of channelling external financing towards productive entrepreneurship.

Finally, our research highlights the importance of banking diversity in contributing to entrepreneurship, finding that commercial banks are far more significant than credit unions and cooperative banks in assuring the registration of new businesses.

In this sense, despite the differences in the missions of these two types of financial institutions, regulators and politicians should try to incentivize credit unions and cooperative banks to mimic the actions of commercial ones. Essentially, this might be accomplished by promoting procedures that encourage collaboration between the two types of institutions. Cooperation mechanisms enable the transfer of know-how and allow for economies of scale. Co-lending and risk-sharing agreements allow cooperatives to leverage local information advantages (relational lending), while commercial banks contribute balance sheet capacity, diversification, and portfolio management expertise. Similarly, loan participation agreements (transfer/participation in loan quotas) and referral agreements (protocols for sending customers to the most suitable intermediary) reduce the inefficiency caused by outright rejections and increase the likelihood that viable business projects will find

a financing channel. Furthermore, a typical constraint for smaller intermediaries is the high fixed cost of compliance, technology, and risk analysis. Policy makers can promote consortia or shared infrastructures (e.g., shared service platforms) for loan origination systems, credit analytics, and debt collection. This allows cooperatives to adopt more standardized and replicable processes that is a distinctive feature of commercial banks.

Forward-thinking policies and synergy among financial institutions can assure long-term economic growth and increasing entrepreneurship.

In addition to mechanisms for cooperation between financial intermediaries, policymakers can further incentivize entrepreneurial activity by promoting collaboration between public institutions and private financial actors. In many contexts, market inefficiencies - such as information asymmetries, high uncertainty, and credit constraints - limit the availability of financing for new businesses. Public intervention can play a complementary role by sharing risks with private investors and financial institutions. Through instruments such as co-investment funds, public guarantees, and risk-sharing schemes, governments can reduce the perceived risk associated with lending and investments. This encourages private intermediaries to allocate greater resources to early-stage and high-risk projects. In this context, public intervention does not replace private financing, but complements it. The importance of public-private cooperation is demonstrated by international experience. A significant example is the Yozma Program, introduced in Israel in the early 1990s. The program was designed to stimulate the development of the venture capital market through the creation of public-private investment funds. These funds combined public capital with that of private investors. Additionally, they offered favorable terms, such as the possibility for private investors to acquire the public share. The program reduced investment risk and attracted significant foreign capital. This initiative played a crucial role in overcoming the financial constraints faced by innovative startups, particularly in high-tech sectors. As a result, Israel became a major global hub for innovation. A notable European example is the role of Bpifrance in France, which has become a central pillar of the national entrepreneurial ecosystem. Bpifrance operates as a public investment bank supporting startups and small and medium-sized enterprises. It does so through a

combination of direct loans, credit guarantees, and equity investments. It shares risk with private financial institutions and encourages banks to extend credit to younger and riskier companies. This model is particularly effective in countering information asymmetry and credit rationing. Bpifrance, through co-financing mechanisms and public guarantees, strengthens the financial system's overall capacity to support entrepreneurial activity. At the same time, it promotes collaboration between different types of financial intermediaries. Furthermore, it strengthens complementarity between public institutions, commercial banks, and other market participants. Taken together, these examples highlight how effective policy interventions rely not solely on strengthening individual financial institutions, but rather on promoting complementarity between the various actors within the financial system (Avnimelech, 2009).

A variety of sensitivity analyses back up our empirical findings, shining light on the importance of policy implications that can be enacted to assure the growth of the entrepreneurial fabric while also igniting a passionate debate about the role of financial system. For instance, our research also highlighted the significance of a strong institutional framework in fostering entrepreneurship. National financial systems should operate in a high-quality institutional context characterized by transparent governance, an efficient legal and bureaucratic system, and an ongoing anti-corruption campaign. As a result, governments should concentrate on identifying institutional modifications that promote entrepreneurship.

One of the chapter’s limitations is the use of the number of bank branches as a proxy for the development of the banking system. Although this indicator offers a tangible measure of the territorial penetration of banking institutions, it is not necessarily an accurate reflection of the development of the banking system. In particular, the reduction of bank branches in advanced economies does not necessarily signal a decline in the banking system but may reflect greater efficiency due to digital technologies and the structural transformation of the sector. Indeed, the spread of online services makes it possible to serve more customers with less physical infrastructure, keeping the system developed and functional. In developing countries, on the other hand, the number of branches remains a relevant indicator for access to banking services, given the low diffusion of technology. However, the

quality and diversification of services offered can vary greatly between branches, affecting the level of development of the banking system regardless of the number of branches. Another limitation of this chapter is the inability to directly observe the quantity, and, above all, the quality of the financing offered to start-ups. Although it considers indicators of the development and structure of the banking system, the analysis does not have granular measures of the volumes of credit actually granted to start-ups and young companies, nor of the contractual conditions that determine their accessibility and intensity (e.g. interest rates applied, collateral requirements, maturities, covenants, decision times and rejection rates for loan applications). This limitation does not allow for the precise identification of the underlying channels through which the relationship under investigation is realised. In particular, depending on the country or period, the estimated link could reflect an increase in the amount of credit available, an improvement in project selection and monitoring (reduction in information asymmetries) or a change in the price of capital. Consequently, in the absence of data at the firm or contract level, it is not possible to distinguish whether and to what extent the observed effect stems from an expansion of supply, an improvement in allocation or changes in the composition of the financial instruments used by aspiring entrepreneurs. A further limitation of the chapter concerns the measure of entrepreneurship adopted, based on new business registrations. Although this is a widely used indicator, it mainly captures the quantity of entries. In fact, it does not provide information on the sectoral composition and economic quality of new initiatives. In particular, this proxy does not allow a distinction to be made between companies operating in technology-intensive sectors and activities in traditional sectors with low innovation content. Furthermore, it does not allow for the separation of enterprises with high growth potential from micro-activities or self-employment initiatives, which often characterise necessity-driven entries. In this sense, the estimated association between financial system development and new registrations does not allow us to determine whether finance is mainly supporting opportunity-driven and innovative entrepreneurship or necessity entrepreneurship.

Future research could integrate more comprehensive indicators, such as the quality of credit disbursed or the degree of technological innovation in the banking system,

to better capture the facets of banking development. Future research could use alternative measures of entrepreneurship that also consider type. These could include: (i) entry by sector and technological intensity, (ii) innovation indicators (patents, R&D expenditure, technology adoption), (iii) post-entry performance (survival, employment and turnover growth). This would make it possible to assess whether and to what extent the financial development and composition of the banking system favour not only the start-up of new businesses, but also the creation of initiatives with a high impact on productivity and long-term growth.

In addition, as future research we could investigate whether banking market concentration moderates the effect of financial development on entrepreneurship. Theory provides ambiguous predictions. On the one hand, greater concentration could weaken the effect of financial development on new business creation. This happens if greater market power leads to more restrictive credit conditions or reduces the incentives of incumbent operators to serve borrowers with low information transparency, such as start-ups. On the other hand, concentration may be associated with larger and more efficient intermediaries that exploit economies of scale and invest in monitoring technologies. Despite these limitations, using the number of branches as a proxy is a valid choice as it provides an objective, comparable metric available for a wide range of countries and time periods.

For future research, other methodologies, such as "quantile regression" (i.e., analyzing the effect of financial development on entrepreneurship at different points of the conditional distribution) and "error correction model" (i.e., investigating the short and long-term impact of financial development on entrepreneurship) could be implemented in order to investigate the nexus between financial development and entrepreneurship. Other cyclical, market, social, political, and institutional factors should also be considered in order to discover possible processes that could explain the mechanics behind how financial development affects entrepreneurship.

CHAPTER 3

Does the Diversity of Banking Affect the Relationship Between Financial Development and Entrepreneurship? An Empirical and Theoretical Framework

Abstract

Chapter 3 concludes with a theoretical model that compares how commercial and cooperative banks behave when making decisions about credit supply. The theoretical findings confirm that cooperative banks, which prioritize the well-being of their members and stand out due to their local origins, strongly support local business. Theoretical predictions are validated by empirical evidence obtained by applying the Instrumental variables estimation using heteroskedasticity-based instruments (IVH) technique to a balanced sample of ten developing countries. The evidence confirms that cooperatives have a particularly positive impact on the creation of new businesses, primarily because of their capacity to evaluate risk on a case-by-case basis. The evidence highlights the structural challenges common to developing nations, such as a lack of collateral, ineffective bureaucracy, and restricted access to financial resources.

3.1 Introduction

Entrepreneurship is widely recognised as one of the main drivers of economic growth, innovation and job creation (Iakovleva et al., 2011; Lepojevic et al., 2016; Acs et al., 2009). However, starting and consolidating a new business remains an inherently risky process, especially in the early stages, when high fixed costs and market uncertainty make access to financial resources crucial. This critical issue becomes even more pressing in developing economies, where greater institutional fragility accentuates liquidity constraints, credit rationing and vulnerability to macroeconomic shocks (Fomba et al., 2023; Banerjee & Duflo, 2014). In such contexts, the banking system is the predominant channel for intermediation between

savings and investment. The physical proximity of branches and the relational nature of credit not only affect the availability of financing, but also the quality of the information collected and the ability to select worthy projects.

In this context, the chapter aims to verify whether financial development promotes the creation of new businesses (H1) and whether the effect is not uniform among intermediaries but varies in intensity depending on the type of bank (H2). This is because we believe that governance models, local roots and the production of "soft information" can mitigate information asymmetries and reduce credit rationing (Cornée, 2014; Birchall & Ketilson, 2009). In other words, the central hypothesis is that banking diversity is not an end in itself, but a mechanism that modifies the channels through which finance reaches the real economy and supports entrepreneurship. This is particularly important in environments characterised by greater fragility and less availability of alternative financial instruments.

This chapter fills precisely this gap in the existing literature. On the one hand, it proposes a theoretical model of strategic interaction between two types of coexisting banks - commercial banks and cooperative banks - showing how equilibrium outcomes in the credit market depend on the structural objectives of intermediaries. In fact, while commercial banks maximise profit, cooperative banks also look to the welfare of their members, with implications for the amount of credit provided in equilibrium (Saunders et al., 2022; Mishkin & Eakins, 2018). On the other hand, the chapter provides empirical validation of the predictions of the theoretical model through a panel analysis of a balanced international sample of 10 developing countries over the period 2006–2021. Within the dataset, entrepreneurship is measured by business density and financial development is captured by the presence of bank branches (commercial and cooperative) in relation to both population and surface area. To address endogeneity issues, causal identification is achieved using an instrumental variable strategy that exploits the heteroscedasticity of errors (i.e., IV-H). This allows us to estimate the effect of financial development and rigorously compare the impact of different intermediaries. Overall, the chapter aims to clarify

not only whether finance matters for new business creation in developing countries, but also through which intermediaries this relationship is strengthened or weakened.

The remainder of the chapter is structured as follow. Section 3.2 introduces the key functions of the financial system that are most relevant for entrepreneurial activity. Sections 3.3–3.5 expand the conceptual background by discussing entrepreneurship in Europe, the link between entrepreneurship and inequality, and the institutional foundations shaping entrepreneurial dynamics. Section 3.6 motivates the empirical focus on developing countries by emphasising the central role of banks in contexts characterised by weaker institutions, higher informality and limited alternative financing channels. Section 3.7 positions the chapter within the existing literature on finance and entrepreneurship. Section 3.8 develops the theoretical setting, while Section 3.8.1 formalises a simple model of banking diversity. Section 3.9 presents the international dataset and the construction of variables, complemented by descriptive evidence through stylised facts, summary statistics and pairwise correlations. Section 3.10 outlines the empirical specification and identification strategy, detailing the IV-H approach to address endogeneity and reporting the baseline results. Finally, Section 3.11 concludes by discussing the main findings and their implications.

3.2 The Key Functions of the Financial System

As Levine (1997) points out, the financial system can be analysed through five essential functions. The first concerns the ability to facilitate the negotiation and hedging of idiosyncratic and liquidity risks, thereby reducing the uncertainty that normally hinders entrepreneurial activity. Idiosyncratic risks (i.e. those specific to a single project or company) may arise from unforeseen events. The financial system allows these risks to be mitigated through insurance mechanisms, derivatives and portfolio diversification, thus enabling them to be shared with other economic actors. (Allen & Gale, 1999). In this way, entrepreneurs are no longer forced to bear the full brunt of adverse events, but can distribute them, increasing the sustainability of their investment choices. Similarly, liquidity risks, which arise when a company encounters difficulties in converting its assets into immediately available cash, are

mitigated thanks to the role played by banks and financial markets. These provide instruments such as credit lines, advances on trade receivables and the issuance of short-term securities, which make it possible to meet sudden cash requirements and reduce the risk of premature bankruptcies due to temporary liquidity crises (Diamond & Dybvig, 1983). The possibility of covering or sharing such risks has a significant impact on entrepreneurship, as it encourages individuals to undertake innovative and high-return activities that would otherwise be perceived as too risky. As highlighted by Kihlstrom & Laffont (1979), the availability of financial instruments that reduce risk exposure allows individuals with different risk versions to enter into entrepreneurial activity. This increases the variety and quantity of new ventures. Recent studies show that, in developed financial markets, risk hedging helps to stabilise entrepreneurs' income. This stability, in turn, stimulates more productive investment, with positive repercussions on long-term economic growth (Aghion et al., 2010).

The second function is related to the acquisition of investment information and the efficient allocation of resources. Financial intermediaries are responsible for collecting, processing and disseminating data on the creditworthiness of entrepreneurs and the potential returns of projects. In this way, they reduce information asymmetries and direct capital towards the most promising initiatives (King & Levine, 1993; Stiglitz & Weiss, 1981).

A third function is the monitoring of managers and the exercise of corporate control, an activity that aims to reduce inefficiencies arising from conflicts of interest between owners, financiers and executives. In modern companies, characterised by a separation between ownership and control, the so-called agency problem arises. This issue becomes clear when the managers pursue personal goals to the detriment of shareholders or financiers, for example through the misuse of resources, excessively risky investments or, conversely, excessively conservative strategies (Jensen & Meckling, 2019). Financial intermediaries, and banks in particular, play a crucial role in mitigating opportunistic behaviour. They do so through monitoring and discipline mechanisms. To achieve this, they impose strict contractual clauses,

require guarantees or adopt financial constraints that limit managers' decisions (Shleifer & Vishny, 1997). In this sense, the financial system does not merely provide capital. It also functions as a mechanism that reinforces managerial discipline. In this way, it increases transparency, reduces information asymmetries and steers strategic choices towards the creation of value for stakeholders. This function is particularly important for newly established companies and innovative start-ups, where the risk of failure is high and the information available to investors is often limited. Financial institutions play a crucial role in increasing the chances of success for newly established companies. They must actively monitor the progress of business projects. In this sense, it is essential that they provide strategic advice and constantly evaluate the company's performance (Hellmann & Puri, 2002).

The fourth function concerns the mobilisation of savings, which allows fragmented and dispersed capital among households to be transformed into concentrated resources available for large-scale entrepreneurial investment. Without the intermediation function, individual savings would remain tied up in unproductive forms of accumulation or earmarked for future consumption. However, the creation and growth of businesses require substantial and lasting capital. Financial institutions play a crucial role in aggregating small savers, channelling their resources towards entrepreneurial projects, reducing transaction costs and making even capital-intensive investments accessible. This function is particularly important for start-ups and SMEs. Without institutional channels for collecting and redistributing savings, these businesses would find it difficult to obtain financing (Beck et al., 2007). The mobilisation of savings is not only a quantitative issue, but also a qualitative one. A developed financial system is able to offer differentiated instruments, such as deposit accounts, pension funds and capital markets. These instruments attract savers with different risk appetites and time horizons, broadening the capital base available to the real economy (Levine, 2005). In this way, savings that would otherwise remain inactive are channelled into innovative initiatives, helping to sustain productivity and long-term economic growth (Pagano, 1993). This mechanism is particularly important in developing countries, where informality

and low confidence in financial institutions often limit the ability to collect and reinvest domestic savings (Demirgüç-Kunt & Maksimovic, 1998).

Finally, the fifth function consists of facilitating the exchange of goods, services and contracts, reducing transaction costs and creating the conditions for more efficient economic activity. Without a sound and integrated financial system, trade would be limited by technical barriers, high costs and a lack of mutual trust between economic actors. Financial institutions play a crucial role in providing secure and efficient payment instruments that reduce the need for cash and simplify complex transactions. This not only increases the speed and security of trade, but also strengthens trust between economic operators, reducing the risk of fraud and encouraging the formalisation of business activities (North, 1991). Furthermore, the financial system facilitates the execution and enforcement of economic contracts, thanks to the presence of regulated institutions and legal mechanisms that guarantee their fulfilment. The possibility of entering into long-term contracts and having the certainty that they will be respected broadens the time horizon for investment decisions and encourages the development of stable commercial relationships (La Porta et al., 1998). In markets without a reliable financial system, however, contracts are often based solely on personal relationships and informal networks, which limits the scale and efficiency of trade. This function is particularly relevant in the current context of global digitalisation. The development of electronic payment infrastructures and fintech systems has extended access to international markets to small businesses as well. This has made it possible to drastically reduce transaction costs and increase their competitiveness (Philippon, 2016; Claessens et al., 2018).

Taken together, these functions demonstrate that the financial system goes far beyond the mere financing of businesses; it operates as a complex mechanism for risk reduction, investment selection and monitoring, resource accumulation and trade facilitation. This scenario confirms the central role of financial development in promoting more robust, inclusive and innovative entrepreneurial dynamics. Differences in the quality and depth of financial systems largely explain the

divergences in levels of entrepreneurship and growth observed between developed countries and emerging economies (Beck & Demirgüç-Kunt, 2006).

3.3 Entrepreneurship in Europe

Entrepreneurship is now universally recognised as one of the main drivers of economic growth, innovation and employment. In this regard, the European Commission considers it an indispensable driver of the Union's competitiveness (European Commission, 2013). It emphasises the need not only to to support the creation of new businesses, but above all to change the widespread culture surrounding entrepreneurship. The latter is still too often seen as a residual or excessively risky choice compared to salaried employment. Structural interventions are needed to change this perception. These include strengthening entrepreneurial education, facilitating access to finance and reducing bureaucracy. It is also necessary to create an ecosystem capable of supporting companies at every stage of their life cycle.

One of the most significant areas on which the Commission has placed emphasis is entrepreneurial education and training. Many studies show that early exposure to entrepreneurship, even during school, increases the likelihood that young people will choose to start their own business. This also reduces the gap between the intention to start a business and its actual realisation (Fayolle & Gailly, 2015). Up to 20% of students who participate in mini-enterprise programmes in secondary schools subsequently start their own businesses. This percentage is three to five times higher than in the general population. For this reason, integrating entrepreneurial education into school curricula at all levels – from primary school to university – is a winning strategy. It is an investment in human capital formation and a way to strengthen the resilience and innovative capacity of European economies.

Alongside education, the second major obstacle identified concerns access to finance, especially in the early stages of a business's life cycle. Economic literature has amply demonstrated that capital scarcity is a significant constraint on market

entry and the development of innovative projects (Beck & Demirgüç-Kunt, 2006; Levine, 2005). In this context, the Commission has proposed the creation of specialised markets for SMEs, the expansion of microcredit and the promotion of alternative instruments such as crowdfunding. These measures are part of a broader debate on the role of the financial system in economic development. A diversified banking system, which also includes non-traditional players, is particularly effective in supporting groups that often have difficulty accessing credit. This is the case for young entrepreneurs, women and migrants.

The European Commission also highlights the problem of business survival in the early years of operation. Around 50% of new businesses fail within the first five years, often due to an unfavourable ecosystem, complex tax burdens and a lack of support services. The Commission has recommended that Member States introduce more favourable tax regimes, simplify administrative procedures and promote integrated support mechanisms, including accelerators and one-stop shops for businesses. In the literature, these measures are linked to the concept of "entrepreneurial ecosystems", in which the combination of human capital, institutions, infrastructure, culture and market determines the degree of success of start-ups. A dynamic entrepreneurial ecosystem not only promotes the survival of businesses, but also stimulates technological spillover and knowledge diffusion, which increase aggregate productivity (Audretsch & Belitski, 2017).

Particular attention is also given to the role of digital technologies as a lever for entrepreneurship. Thanks to low barriers to entry and low initial costs, digital start-ups represent a launch pad for new generations of entrepreneurs. They grow faster than traditional businesses, but are also more likely to fail, which makes it essential to put specific support measures in place (European Commission, 2013). Digitalisation is no longer an optional choice, but a necessary condition for competitiveness, as demonstrated by the fact that digitalised SMEs grow two to three times faster than non-digitalised ones. The literature has confirmed the importance of digital technologies in reducing transaction costs and opening up international markets (Nambisan, 2017).

In this context, the psychological perception of failure plays a key role. The culture of failure is often associated with stigma and marginalisation. However, numerous studies show that entrepreneurial failure can be a learning opportunity. This increases the chances of success in subsequent ventures (Ucbasaran et al., 2013). For this reason, the Commission calls on Member States to reduce the time required for legal rehabilitation and to introduce specific support measures, transforming failure into a learning experience. This perspective is consistent with the concept of "resilient entrepreneurship". According to this paradigm, the ability to recover from failure is as crucial an entrepreneurial skill as the ability to identify new opportunities.

The European Commission is focusing also on the need to promote under-represented groups of entrepreneurs, such as women, young people, migrants and the unemployed. These are seen as a pool of untapped potential. Although they represent 52% of the European population, women account for only a third of entrepreneurs. Migrants, despite having a greater propensity to start businesses, face significant legal and cultural barriers. Encouraging the inclusion of these groups is not just a matter of fairness. It serves to increase entrepreneurial capital and the diversity of business models, with positive effects on innovation and the resilience of the economic system.

3.4 Entrepreneurship and Inequality

The relationship between entrepreneurship and inequality is a topic that is increasingly being studied in economic and sociological literature. It concerns fundamental issues regarding the distribution of opportunities and the effects of entrepreneurial activity on society. A significant contribution to this field is the article by Lippmann & Aldrich (2005). The authors show how entrepreneurship not only reflects existing inequalities, but sometimes reproduces and even accentuates them. In other words, entrepreneurship is a double-edged sword. On the one hand, it is a source of innovation, growth and social mobility. On the other, it risks

amplifying economic and social disparities if access to capital, networks and skills remains asymmetrically distributed.

A first aspect concerns the distinction between necessity entrepreneurship and opportunity entrepreneurship. The former is typical of those who, excluded from the labour market, start businesses with low capital investment and poor growth prospects. Although they guarantee a minimum income, they rarely manage to compete or generate a significant impact on the economy (Acs, 2006). Opportunity entrepreneurship, on the other hand, is based on the ability to identify market niches, introduce innovations and attract capital, creating positive effects on the entire economic fabric (Shane, 2003). However, access to this form of entrepreneurship is strongly influenced by individuals' socio-economic background. As a result, the most disadvantaged sections of the population often remain confined to low-yield activities, perpetuating inequalities.

The role of human and social capital is another key element. People with high levels of education, skilled work experience and extensive social networks are more likely to start successful businesses. Conversely, those from backgrounds with low human capital and limited networks find it difficult to obtain financing, attract talent or access profitable markets (Coleman, 1988; Burt, 2003). Pre-existing inequalities in education and job opportunities are directly reflected in entrepreneurial disparities. As Lippmann & Aldrich point out, this creates a vicious circle: the most advantaged consolidate their position through entrepreneurship, while marginalised groups remain trapped in precarious forms of self-employment.

Subsequent literature has enriched this picture, highlighting how entrepreneurship can sometimes serve as a channel for social mobility for disadvantaged groups. However, this is only possible in the presence of favourable ecosystems that guarantee access to credit, training and markets (Aghion & Howitt, 2009). In the absence of such conditions, entrepreneurship tends to become a survival strategy rather than a lever for economic emancipation. It follows that entrepreneurship is not a neutral phenomenon with regard to inequality.

From a macroeconomic perspective, the link between entrepreneurship and inequality takes on further nuances. Some studies have suggested that moderate levels of inequality can stimulate entrepreneurial activity, as they create incentives for seeking new opportunities and accumulating capital (Galor & Zeira, 1993). However, beyond a certain threshold, inequality becomes an obstacle. It limits access to credit and reduces aggregate demand. As a result, emerging businesses find it difficult to grow in polarised markets (Banerjee & Newman, 1993). In this sense, inequality not only influences the distribution of entrepreneurial opportunities, but also affects the sustainability of long-term growth dynamics.

A particularly relevant aspect of Lippmann & Aldrich's analysis is their focus on institutional and cultural dimensions. Social norms, public policies and welfare regimes play a crucial role in determining how entrepreneurship and inequality interact. In countries with more inclusive welfare systems, entrepreneurship is perceived as less risky. This is because people know they can count on institutional support in the event of failure. Conversely, in contexts lacking adequate social protections, starting a business can represent an excessive risk. For this reason, such a choice becomes accessible only to those who already have considerable economic resources (Esping-Andersen, 1990).

The relationship between entrepreneurship and inequality cannot be analysed without considering the global dimension. The growing interconnection of markets and the spread of digital technologies have expanded entrepreneurial opportunities. However, they have also widened the gap between those who have access to technologically advanced infrastructure and those who are excluded from it (Nambisan, 2017). At the same time, phenomena such as financialisation and the concentration of capital in large global platforms risk further marginalising small local businesses. This can lead to the exclusion of the most vulnerable social groups and the aggregation of those living in more favourable contexts (Piketty, 2014).

In conclusion, the analysis by Lippmann & Aldrich (2005) offers a critical perspective that warns against an overly optimistic view of entrepreneurship as a

universal panacea for economic development. It shows that entrepreneurship is a layered phenomenon, the outcomes of which depend largely on the structural conditions in which it occurs. For policymakers and economists, this implies the need to design public policies that reduce barriers to entry for disadvantaged groups, strengthen financial inclusion mechanisms, and promote fair and sustainable entrepreneurial ecosystems. Only in this way can entrepreneurship fully perform its function as an engine of economic growth, without at the same time contributing to the perpetuation of social and economic inequalities.

3.5 Entrepreneurship and Institutions

Entrepreneurship is a process deeply rooted in the institutional context. Hwang & Powell (2005) emphasise that institutions are the framework within which entrepreneurial activities develop. Institutions include norms, formal and informal rules, professional standards, political processes and organisational practices. This approach moves away from a minimalist view of entrepreneurship, seen only as a response to economic incentives. Instead, it frames it within a broader context of social, cultural and institutional relationships. In this sense, entrepreneurship is not an isolated act, but a phenomenon that reflects, reinforces and sometimes transforms existing institutions.

Institutions influence entrepreneurship in many ways. On the one hand, they determine which forms of economic activity are considered legitimate and which are marginalised or excluded (North, 1991). The presence of an effective legal system, the protection of property rights and the existence of recognised professional standards are all elements that reduce uncertainty and increase the confidence of economic actors. On the other hand, institutions help shape the preferences and strategies of entrepreneurs by providing cognitive and cultural frameworks that influence the perception of opportunities. For example, in contexts with a strong collectivist influence, entrepreneurship tends to manifest itself through cooperative

and social economy initiatives. Conversely, in more individualistic contexts, forms of entrepreneurship geared towards individual profit prevail (Hofstede, 2001).

An important contribution by Hwang & Powell (2005) is the attention they pay to institutional entrepreneurs. These entrepreneurs do not simply act within existing rules. They seek to transform them or create new ones. This perspective shows how entrepreneurship is both an economic and a political and social process. Entrepreneurs take an active role in redefining the institutional conditions that regulate markets. Professionals (lawyers, consultants, analysts, venture capitalists) play a central role in this process. They act as mediators between innovation and institutions, translating new practices into recognised languages and standards. Through their actions, they confer legitimacy on new organisational forms, facilitating their acceptance and dissemination.

The institutional dimension also manifests itself through standardisation and rule-making processes. New sectors, such as high technology, biotechnology or the green economy, cannot consolidate without the creation of shared rules and standards. As Hwang & Powell point out, the definition of these standards is often the result of negotiations between companies, government agencies, professional associations and NGOs. This process is neither linear nor neutral: it reflects power relations, economic interests and social dynamics that may favour some actors over others (Fligstein, 2018). Entrepreneurship, therefore, is not only the ability to seize opportunities, but also to influence and shape the rules that define them.

A particularly interesting aspect concerns the unexpected consequences of institutional transformations led by entrepreneurs. In an attempt to legitimise new practices, entrepreneurs can generate side effects that go beyond their original intentions. For example, the adoption of new standards in a sector can exclude some actors who are unable to adapt, accentuating inequalities in market access (DiMaggio & Powell, 1983). At the same time, institutionalisation processes can reduce the initial variety of entrepreneurial solutions, favouring the emergence of dominant models that tend to standardise organisational practices. This phenomenon, known as institutional isomorphism, demonstrates how the same

forces that facilitate the legitimisation of new businesses can, in the long term, reduce entrepreneurial diversity and limit radical innovation.

Hwang & Powell's perspective therefore invites us to consider entrepreneurship as a constructivist phenomenon, in which opportunities are not simply “discovered” by entrepreneurs, but constructed through social and institutional interactions. In this view, entrepreneurial opportunities are the result of collective definition processes involving a variety of actors: entrepreneurs, investors, regulators, media, and consumers. This implies that the trajectories of entrepreneurship cannot be considered in isolation from the institutional context that makes them possible (Garud et al., 2007).

In conclusion, the institutional approach to entrepreneurship developed by Hwang & Powell helps to overcome the individualistic view that has long dominated economic and management studies. It shows how entrepreneurship is a phenomenon deeply intertwined with social, cultural and political institutions.

3.6 The Central Role of Banks in Developing Countries

This chapter analyses only developing countries, as they are characterised by:

1. Less developed and more imperfect financial markets;
2. Weaker institutions and greater economic informality:
3. The central role of banks in the creation of businesses:
4. High vulnerability to macroeconomic shocks.

In developing countries, financial markets are less efficient and less developed than those in advanced countries. This is due to a combination of institutional, regulatory and infrastructural factors that limit their ability to support economic growth and allocate resources optimally (Demirgüç-Kunt & Levine, 2001). First, financial markets are shallower. They offer a smaller variety of instruments and concentrate activity in a few segments, often dominated by the banking sector. This, in turn, can suffer from capital fragility and less rigorous supervision (La Porta et al., 1997). The

lack of specialised financial intermediaries (such as investment funds or liquid bond markets) limits risk diversification options and access to capital for businesses and households. This generates a heavy dependence on bank credit, which often results in onerous conditions or financial exclusion (Beck & Levine, 2002). Furthermore, emerging markets tend to be characterised by greater asset price volatility and higher systemic risk. This is due to poor information transparency and frequent macroeconomic and political instability (Bekaert & Harvey, 2003). Information asymmetry, which is more pronounced than in developed countries, hinders the proper functioning of investment selection and evaluation mechanisms. This fuels adverse selection and moral hazard phenomena (Stiglitz & Weiss, 1981). Legal protection for investors and the effectiveness of judicial systems are also more limited, discouraging foreign investor participation and increasing capital costs (Djankov et al., 2008). The combination of these factors results in financial markets that are shallower, less liquid and more imperfect, and which are unable to fully support economic development and financial stability (Rajan & Zingales, 1996; Levine, 2005; Allen et al., 2014).

In developing countries, institutions have limited capacity to regulate and monitor the economic environment. This has direct consequences on the spread of the underground economy. Institutional weakness manifests itself in various ways. From the fragility of the rule of law and the independence of the judiciary, to poor fiscal and administrative capacity. Added to this is the lack of effective mechanisms to protect property rights and enforce contracts (North, 1991). This situation pushes businesses and workers to operate outside the legal framework, fuelling underground economic circuits that in some countries constitute a significant part of GDP (La Porta & Shleifer, 2014; Medina & Schneider, 2019). Informality thus becomes a survival strategy for a large part of the population, especially in contexts with high unemployment, complex tax systems and excessive bureaucratic costs for starting and running a business (De Soto, 1989; Kanbur, 2009). Conversely, in developed countries, stronger institutions and greater legal certainty reduce incentives to operate informally. Streamlined administrative procedures encourage the creation and formalisation of productive activities (Perry et al., 2007). In

developing countries, the lack of credible institutions reduces economic actors' trust in the state and its redistributive capacity. This reinforces the trap of informality and limits tax collection. This situation has a negative impact on the financing of public goods and essential services (Besley & Persson, 2011). A vicious circle is created: weak institutions and high informality reinforce each other. This hinders inclusive development and makes integration into global value chains more difficult. In contrast, in high-income countries, the informal economy is marginal and institutions play a central role in ensuring stability, efficiency and social cohesion (Schneider & Enste, 2000).

Furthermore, in emerging economies, banks play a much more central role in the creation and growth of businesses. Advanced economies, on the other hand, have a financial system with greater diversification of capital sources, including stock exchanges, venture capital funds and bond markets (Demirgüç-Kunt & Levine, 2001; Allen et al., 2014). However, in many emerging economies, due to weak capital markets and a scarcity of alternative financing instruments, banks are the main channel of access to credit for entrepreneurs (Beck et al., 2005). This dependence is particularly strong for small and medium-sized enterprises (SMEs), which constitute the majority of the local productive fabric and find it difficult to meet the requirements of international institutional investors or to raise funds through complex financial instruments (Ayyagari et al., 2007; La Porta et al., 2008).

Furthermore, the bank-business relationship in developing countries is more relational than purely transactional. In fact, credit allocation is often influenced by long-term relationships, personal trust and qualitative assessments, in the absence of advanced credit information systems and transparent financial disclosure (Berger & Udell, 2006; Beck & Demirgüç-Kunt, 2008). This implies that banks not only act as financiers, but also as selectors and facilitators of entrepreneurial development, directly influencing the creation and survival of new businesses. In this context, the credit policies adopted by the banking sector can determine the pace of innovation, the capacity to absorb new labour and even the possibility for the national economy to diversify its productive base (Beck et al., 2000). Conversely, in advanced

economies, banks, while remaining key players, are part of a broader and more competitive ecosystem of financing sources, where companies can access alternative channels that reduce their dependence on bank credit and promote greater risk allocation among different operators (Rajan & Zingales, 1996).

In developing countries, vulnerability to macroeconomic shocks is a crucial factor that distinguishes entrepreneurial dynamics from those in developed countries. New businesses are particularly exposed to interest rate fluctuations, inflationary instability and exchange rate volatility (Aghion et al., 2010; Rajan & Zingales, 1996). This is because they often have low initial capitalisation, limited access to risk management tools and a heavy dependence on bank credit. In contexts where financial systems lack deep markets or adequate hedging instruments, even moderate external shocks can result in a dramatic increase in the cost of capital and a significant contraction in credit (Beck et al., 2007; Laeven & Valencia, 2013). This dynamic directly reduces the possibility of starting new businesses, slowing down formalisation and increasing the weight of the informal sector (Banerjee & Duflo, 2014). Conversely, in advanced economies, more sophisticated financial markets and credible monetary policies mitigate the impact of macroeconomic shocks, limiting their effects on entrepreneurship (Allen et al., 2014). Therefore, analysing the relationship between financial development and new business creation in developing countries is particularly relevant. This allows us to observe how greater macroeconomic fragility amplifies the role of financial institutions in supporting or hindering entrepreneurial dynamics (Beck et al., 2005). In other words, in these countries, financial development not only promotes access to credit but also acts as a mechanism of resilience against exogenous shocks, directly influencing the ability of economies to transform demographic and productive potential into sustainable and inclusive growth.

The decision to limit the analysis to developing countries is based not only on the reasons outlined above, but also on the need for conceptual consistency, validity of measures and empirical identification. In developing and therefore low-income countries, the physical presence of branches is a more accurate indicator of the

degree of financial intermediation available to households and micro-enterprises. In the absence of deep and widespread alternative channels, the extent of the banking network translates directly into access to deposits, payments and credit. These are the mechanisms through which financial development affects the creation of new businesses. In advanced countries, on the other hand, branch density tends to reflect organisational and technological changes (digitisation, consolidation, network rationalisation) and not necessarily changes in access to finance. This makes the measurement of financial development incomparable and the causal interpretation of the estimated coefficient ambiguous. Furthermore, the restriction of the sample reduces the structural heterogeneity between financial and institutional systems that are too distant. In this way, we can attribute the differences observed to banking diversity rather than to determinants typical of advanced economies (capital markets, venture capital, support policies) that would attenuate or mask the transmission channel.

3.7 Main Literature

Many theoretical and empirical studies indicate that entrepreneurship plays a decisive role in economic progress. The 2018 ECB Euro Area Corporate Finance Survey revealed that enterprises with access to credit are more inclined to invest, generate employment, expand, and are more prone to innovate and export. Furthermore, the ECB's 2020 Euro Area Corporate Finance Survey revealed that the COVID-19 pandemic adversely affected firms' access to finance, increasing the likelihood of downsizing or ceasing operations. The results of these surveys suggest that entrepreneurship is a key factor for economic growth. Indeed, entrepreneurs ensure high economic growth in their country through investment and job creation. The issue of job creation is also extensively discussed. Indeed, Mayer et al. (2018) examine the evidence on the impact of entrepreneurship on job creation, gender and ethnic discrimination, university spin-offs and economic growth. They note that judgement on the quality of these jobs is still uncertain. While small businesses are undoubtedly a driver of job creation, they may attract a different type of worker than established businesses that are less concerned with wages and more concerned with

social responsibility, innovation and the importance of challenge. Moreover, entrepreneurial endeavours stimulate innovation and competition, resulting in enhanced efficiency and productivity (Acs et al, 2009; Agarwal et al, 2010; Aghion et al, 2009; Carree & Thurik, 2003; Fritsch & Changoluisa, 2017; Kirzner, 1997; Metcalfe, 2004; Quadrini, 2009). Considering the significance of entrepreneurship as a catalyst for economic growth and development, it is essential to understand the elements that facilitate or hinder entrepreneurial activities. Entrepreneurial activity is actually also the result of a complex interaction between individual, social and sectoral factors. The personal characteristics of entrepreneurs are a decisive factor. Their level of education and the skills they have acquired influence their ability to identify and exploit market opportunities (Davidsson & Honig, 2003). Furthermore, previous work experience and specific professional background reduce information asymmetries and increase the chances of success for the business (Acs et al., 2014). Furthermore, aspects related to psychological capital – such as resilience, self-efficacy and creativity – have been identified as key factors that strengthen entrepreneurial propensity in contexts of high uncertainty (Hmieleski & Baron, 2009).

Cultural and social determinants are also important, as collective norms and values can influence the perception of prestige associated with entrepreneurial activity, fostering the emergence of more dynamic ecosystems (Hofstede, 2001; Wennekers et al., 2005). Another important factor is social capital (understood as the density and quality of professional and personal relationships), which is essential for access to information, customers and financing (Stam et al., 2014). At the same time, trust in institutions and financial systems is a prerequisite for starting new businesses, particularly in developing countries where regulatory stability and the reduction of information asymmetries are often limited.

Finally, organisational and market factors strongly determine entrepreneurial trajectories. In innovative sectors that are highly intensive in human and technological capital, financial and infrastructural support is an essential condition for growth (Audretsch et al., 2006). Conversely, in traditional or low-tech sectors,

entrepreneurship depends more on territorial roots and proximity to local networks (Fritsch & Wyrwich, 2017). The organisational culture of established companies can also have an indirect effect. In fact, it can generate spin-offs or start-ups when it promotes autonomy, innovation and continuous learning (Agarwal et al., 2010). Access to digital infrastructure and global connectivity can help to significantly lower barriers to entry in various markets, making entrepreneurship more accessible and diverse (Nambisan, 2017).

Setting up and leading a firm, particularly for (prospective) entrepreneurs, typically entails significant start-up and operational expenses. Entrepreneurs frequently want substantial external financing at minimal interest rates to initiate and operate their enterprises. In this context, financial intermediation can address entrepreneurial finance requirements for two reasons. Primarily, financial intermediaries can allocate funds at a minimal expense. Companies can reduce mobilisation costs by prioritising the collection of savings (e.g. Levine, 1997). Secondly, financial intermediaries can furnish substantial loans. In this way it can mitigate the risk of economically inefficient size and enhance the appeal of capital-intensive company ventures for prospective entrepreneurs. Moreover, financial intermediaries allow businesses to operate with reduced overhead expenses (e.g., credit card transactions, wire transfers). This encourages entrepreneurial endeavours that could otherwise falter due to elevated operational costs.

Simultaneously, financial intermediation advantages the entrepreneurs' future investors, namely the lenders. These lenders exhibit a strong interest in risk and information management. Each investing decision entails a distinct risk. The risk is notably elevated when initiating a new firm due to the uncertainty of market conditions, the unpredictable effects of innovation, the steep learning curves, and the unfamiliarity of business networks. This danger may diminish the appeal of investing in entrepreneurial endeavours. Conversely, individual investors might employ financial intermediation to control and distribute their investment risk (e.g., via portfolio diversification). This reduces their exposure to particular investment projects (Levine, 1997). Moreover, creditors face substantial information costs both

during the evaluation of specific investment projects (e.g., when assessing entrepreneurs' capabilities) and subsequent to a favourable investment decision. The information asymmetry between the investor and the lender (i.e., the entrepreneur) incentivises entrepreneurs to misrepresent outcomes (e.g., a firm's earnings) to creditors (Shleifer & Vishny, 1997). Given these information costs, creditors may use financial intermediaries to acquire and analyse information about available investment opportunities (e.g., Lee, 1996). In addition, they may also delegate the supervision of investment projects to them, thereby conserving resources for the financial intermediary (Levine, 1997). Future entrepreneurs require accessible, affordable, and comprehensive financing. At the same time, potential investors demand effective and convenient risk and information management. These two requirements create a significant need for financial intermediaries. Financial development at the national level is measured by improvements in five essential functions. These include risk management and resource allocation. Corporate governance and savings mobilisation are also key. Finally, facilitating economic transactions through an efficient financial infrastructure is crucial (Cihák et al., 2012). Consequently, nations exhibiting superior financial depth, access, efficiency, and stability demonstrate a heightened degree of financial growth. As previously said, entrepreneurship should yield multiple advantages. A high degree of financial inclusion enhances the likelihood that entrepreneurs would obtain loans based on their abilities rather than their social standing, so expanding the pool of possible entrepreneurs and subsequently elevating the national level of entrepreneurship. Consequently, it can be argued that financial growth stimulates entrepreneurial activity, aligning with the foundational studies of Schumpeter (1934), King & Levine (1993 a, b), and others.

This paper attempts to answer two important research questions: Is financial development beneficial for new firm creation? Is bank diversity important in the context of financial development and entrepreneurship?

Regarding the first question, it is evident that although numerous scholars have examined this problem in the literature, their contributions frequently leave many

enquiries unresolved. Dutta & Meierrieks (2021) assert that financial development positively influences entrepreneurial activity by satisfying entrepreneurs' needs for accessible, affordable, and comprehensive credit, as well as investors' requirements for efficient and economical risk and information management. Economists King & Levine (1993 a, b) have demonstrated that financial systems play a crucial role. They evaluate potential entrepreneurs and aggregate savings to finance the most promising ventures. In this way, they mitigate the risks associated with innovative enterprises. Furthermore, they clarify the expected returns from innovation by comparing them with those from the production of traditional goods. Enhanced financial systems increase the probability of successful innovation, hence fostering economic growth. Likewise, disparities within the banking sector may impede economic progress by diminishing the rate of innovation. As far as the second question is concerned, to our knowledge there is no corresponding work in the literature, which makes an evaluation impossible. The influence of diversified banking on the relationship between financial development and entrepreneurship remains an unexamined topic in the literature.

Our contribution is based on two elements. The first is a theoretical model that analyses the impact of banking diversity on entrepreneurship. The second is the empirical validation of the model's predictions. To do this, we used a heterogeneous global sample of 10 developing countries, with data ranging from 2006 to 2021. The research considers two main types of financial intermediaries: commercial banks and cooperative banks. In developing countries, financial systems are predominantly controlled by banks, with bank deposits representing the primary form of household savings and bank loans serving as the principal source of external financing for enterprises.

In this chapter, we attempt to answer our two research questions by using a simple model of strategic interaction between two different types of banks that populate the credit system (commercial banks and cooperative credit banks). We show how the amount of equilibrium credit depends crucially on the different structural objectives of the two different types of credit institutions. We find that cooperative credit banks

grant more credit when certain conditions are met. This result suggests that because they are strongly rooted in the territory and focus on small and medium-sized enterprises, they also provide a greater boost to entrepreneurship. To test our theoretical results and hypotheses, we employ a diversified, international, and balanced sample of 10 developing nations from 2006 to 2021. The distinctiveness of our work is in the sample makeup, enabling us to utilise information from two categories of banks: Commercial and Cooperative banks. This enables comprehension of how different financial intermediaries assist nascent enterprises. The choice to focus our analysis solely on developing (low-income) countries for a specific reason. The chapter wants to better understand the role of financial development in contexts characterised by less diversified economies, weaker institutions and a higher incidence of imperfect financial markets (Knight, 1998; Fomba et al., 2023). In these nations, the existence of bank branches - both commercial and cooperative - is frequently the primary mechanism for directing financial resources to households, which provide the foundation of entrepreneurial endeavours. Unlike industrialised nations, which possess a more developed and diversified financial system, emerging countries encounter structural obstacles, including insufficient sophisticated financial infrastructure, greater economic informality, and a significant dependence on local institutions. In these contexts, physical proximity to bank branches is crucial. It does not merely facilitate access to credit. It also serves to provide essential services such as financial advice and savings management. These services reduce information asymmetries and promote trust between potential entrepreneurs and the banking system. Focusing our analysis on developing countries allows us to study a relationship that may be less evident in industrialised nations. In the latter, the direct influence of bank branches on entrepreneurial initiatives is mitigated by other factors, such as the availability of risk capital, public policies that favour entrepreneurship, and more robust financial markets.

3.8 Theoretical Framework

3.8.1 A Simple Model of Diversity in Banking

We theorise about diversity in banking and its impact on differences in equilibrium levels of lending to customers. We focus on two common types of banks in the international environment, namely credit unions (also known as cooperative banks in the Italian market) and commercial banks. We employ the abbreviation **CB** (cooperative credit banks) to indicate a particular category of financial institutions. These banks operate with a strong territorial rootedness, as their activities are primarily concentrated within the local community. Their members simultaneously assume the role of owners, consumers of the institution's services, or providers of its inputs, thereby creating a close alignment of interests. Characterised by a mutualistic orientation, CBs are mandated to direct the majority of their lending activities towards their own members. The governance is structured according to the democratic principle of *"one head – one vote"*, which ensures equal participation in decision-making irrespective of the level of individual capital contribution. The ultimate purpose of these institutions is not the maximisation of profits but rather the provision of services that advance the economic and social well-being of their members. We now consider in turn the maximisation problem of CBs and commercial banks (COMMs) and examine the difference in the equilibrium level of lending. Let us first consider the commercial bank's maximization problem. Assume that COMMs compete in both the credit and deposit markets. We analyse the interplay between banks by extending the Klein-Monti model (1971) of a single dominant bank to a scenario where *N* banks engage in Cournot competition. Each bank lends L_i, takes deposits D_i (with $i = 1, \dots, N$) and maximize the following profit function:

$$\pi_i(\bar{L}, \bar{D}) = \gamma\, r^L(\bar{L}) L_i + \bar{T} - r^D(\bar{D}) D_i \; ; \qquad (3.1)$$

subject to the balance sheet,

$$L_i + \bar{T} + R = D_i \qquad (3.2)$$

The terms $\bar{L}$ and $\bar{D}$, respectively, represent the total amount of loans $\bar{L} = \sum_{i=1}^{N} L_i$ and the total amount of deposits $\bar{D} = \sum_{i=1}^{N} D_i$ in the market. We rule out the effect of bond interest rate on the decision process by assuming that bonds, $\bar{T}$, are constant and equal to $r^T T$, with r^T representing the bond interest rate[5]. The term R in (3.2) represents the minimum reserve requirement $R = \delta D_i$, with $\delta \in (0,1)$ being the reserve requirement coefficient. We assume that the term γ in eq. (3.1) represents the probability of receiving a return on loans, and $(1-\gamma)$ the probability of receiving zero, in accordance with Allen & Gale (2004). In the model, $\gamma(\rho\ (I,S))$ is inversely proportional to risk ρ, which in turn is influenced by two exogenous variables: (i) the level of information accuracy I that can be used to avoid risky borrowers and (ii) a systematic risk component S which pertains to macroeconomic shocks. Hence, the variable $\gamma(\rho)$ in eq. (3.1) can be considered as a reciprocal indicator of the quality of information, as an enhancement in information accuracy leads to a decrease in credit risk[6].

The loans demand and the deposits supply functions are represented by eq. (3.3) and (3.4) :

$$\bar{L}(r^L) = \alpha - \beta r^L, \tag{3.3}$$

$$\bar{\mathrm{D}}(r^D) = \kappa + \varepsilon r^D, \tag{3.4}$$

[5] To delineate the specific effects of the two categories of banks on the market, we assume a constant value for T. Mutual cooperative banks will be increasingly vulnerable to sovereign default owing to their increased investments in government assets. In contrast, profit-driven commercial banks typically employ a broader investment diversification approach, yet they exhibit lower risk aversion than cooperatives. Owing to our focus on the unique aims of each bank type, we disregard differences in T choices, so eliminating them from the decision-making process.

[6] Banks acquire an informational advantage over other financial entities by accessing non-public information regarding firms and clients (Cornée, 2014). Acquired data can be categorised into two primary types: hard information and soft information. Hard information refers to numerical data that can be easily acquired, stored, and conveyed. The lack of a necessity for actual engagement in the collection method results in decreased costs, although constrains the scope of accessible data. Moreover, data collection might occur independently of its use (Liberti & Petersen, 2018). Soft information refers to implicit customer-related knowledge that is not publicly accessible and is communicated informally. The context in which information is gathered and the person acquiring the information are essential components of the information itself (Liberti & Petersen, 2018).

where $r^L(\bar{L})$ is the interest rate on loans and represents the inverse demand function for loans with $r_L' < 0$, and $r^D(\bar{D})$ is the interest rate on deposits, representing the inverse supply function for deposits with $r_D' > 0$. The terms α and κ on the right-hand side of equations (3.3) and (3.4) represent the market size of loans and deposits respectively. The terms β and ε represent the sensitivity of the demand for credit and the supply of deposits to the interest rates on loans and deposits.

The COMMs' profit function can be derived by combining equations (3.1), (3.2), (3.3), and (3.4).

$$\pi_i(\bar{L}, \bar{D}) = \gamma \frac{(\alpha - \bar{L})}{\beta} L_i + \big((1-\delta)D_i - L_i\big) - \frac{(\bar{D} - \kappa)}{\varepsilon} D_i \tag{3.5}$$

The profit function, defined in equation (3.5), shows the equilibrium between the quantity of loans and deposits in the two markets. It also ensures that there is sufficient liquidity to cover loan defaults during an economic downturn. The N banks maximise their profit in a Cournot framework by independently maximising their returns from loans and deposits.

$$\frac{\partial \pi_i}{\partial L_i}: \ \gamma_i(\alpha - \bar{L}_{-i} - 2L_i) - \beta = 0 \tag{3.6}$$

$$\frac{\partial \pi_i}{\partial D_i}: \varepsilon(1-\delta) - (\bar{D}_{-i} + 2D_i - \kappa) = 0 \tag{3.7}$$

If we assume that banks are symmetric, then, $\bar{L}_{-i} = (N-1)L_i$ and $\bar{D}_{-i} = (N-1)D_i$.

The market's equilibrium level of loans, deposits, and profit for each actor is:

$$L_i{}^* = \frac{(\gamma\alpha - \beta)}{\gamma(N+1)}; \ D_i{}^* = \frac{\big(\kappa + \varepsilon(1-\delta)\big)}{(N+1)} \tag{3.8}$$

$$\pi_i{}^*(L_i{}^*, D_i{}^*) = \gamma \frac{(\alpha - NL_i{}^*)}{\beta} L_i{}^* + \big((1-\delta)D_i{}^* - L_i{}^*\big) - \frac{(ND_i{}^* - \kappa)}{\varepsilon} D_i{}^* \tag{3.9}$$

Rearranging (3.9),

$$\pi_i{}^*(L_i{}^*, D_i{}^*) = \frac{\varepsilon L_i{}^{*2}}{\beta} + \frac{D_i{}^{*2}}{\varepsilon} \tag{3.9'}$$

Let us now examine the maximisation problem of cooperative banks. The economic literature examines several objective functions of banks, considering the role of its members. Smith (1984) discovered that the ideal interest rates and reactions to external fluctuations in a financial institution are significantly shaped by the organization's inclination towards the financial utility of its borrowing and saving members. He grounded this on a model that considers the various interests of these two categories of members.

Emmons & Schmid (2002) characterise the objective function of credit unions as the aggregate value of member surplus and profit. Čihák & Hesse (2007) underscore the capacity of credit unions to utilise their members' surpluses as a safeguard during periods of economic downturn. Members of CBs simultaneously act as owners of the organisation and as consumers of its goods or providers of its inputs. For this reason, we assume that the objective function gives priority to the value of bank membership for all members. Consequently, in contrast to commercial banks, credit unions optimise a utility function that encompasses both member surplus and profit elements.

Specifically, CBs maximise the following function,

$$U_i(\bar{L},\bar{D})=U_i^S(\bar{L},\bar{D})+U_i^\pi(\bar{L},\bar{D}), \quad (3.10)$$

subject to the balance sheet

$$L_i+\bar{T}+R=D_i \quad (3.11)$$

The fundamental objective of the CB is to promote economic benefits for its members, who are also its customers. We therefore assume that CBs also consider member surplus (S_i) when maximising their benefits.

$$U_i(\bar{L},\bar{D})=\theta S_L(L_i)+\eta S_D(D_i)+\pi(\bar{L},\bar{D}), \quad (3.12)$$

The term $S_L(L_i)=\frac{L_i^2}{2\beta}$ in eq. (3.12) represents the borrowing members' surplus and $S_D(D_i)=\frac{D_i^2}{2\varepsilon}$ the saving members' surplus. The terms θ,η are coefficients expressing the weights the CBs place on maximizing, respectively, borrowing and

saving members' surplus. In general, if $\theta > \eta$ we assume that the bank is borrowers-oriented. On the other hand, $\theta < \eta$ indicates a savers-oriented bank, and $\theta = \eta$ reflects a 'democratic' bank[7].

The CB's profit function is

$$\pi_i(\bar{L}, \bar{D}) = \mu r^L(\bar{L}) L_i + \bar{T} - r^D(\bar{D}) D_i, \tag{3.13}$$

$$\bar{L}(r^L) = \alpha - \beta r^L, \tag{3.14}$$

$$\bar{\mathrm{D}}(r^D) = \kappa + \varepsilon r^D, \tag{3.15}$$

The probability of gathering a profit from loans by CB's bank, $\mu\big(\varphi_i(I_i, \upsilon_i, S)\big)$ is influenced by the risk level φ_i. This risk is determined by three external factors: (i) the accuracy of the information I_i, (ii) a systematic risk component S that relates to macroeconomic shocks, and (iii) an idiosyncratic risk component (υ_i), that relates to regional shocks specific to local credit institutions such as CBs. In the case of CBs, the term I_i quantifies in particular the accuracy of the soft information that determines risk management in these institutions, while υ_i also represents the degree of risk associated with local market capture[8]. The term μ in eq. (3.13) could be considered as an indirect indicator of the correctness of the "soft information" about its favourable impact on credit risk.

Specifically, the risk function for the CB bank fulfils the following conditions:

[7] If the weights assigned to the mutual component, denoted as w_k (with $k = \theta, \eta$), are set to 0 the C agent behaves as a typical profit maximizer; if $0 < w_k < 1$, the C bank assigns less importance to the mutualistic objective and prioritises its economic profitability; if $w_k = 1$, the C bank places the same weight on the mutualistic goal and economic profitability; and if $w_k \to \infty$, the C bank places greater emphasis on the mutualistic goal.

[8] Stein (2002) asserts that smaller, less hierarchical firms possess a competitive edge in the effective utilisation of soft information for decision-making. Soft information is defined by its confidentiality, unverifiability, context dependence, and inability to be delegated to external sources. Local banks frequently cultivate robust and enduring loan relationships that enable them to progressively enhance their comprehension and diminish the information disparity, particularly when engaging with clients who possess limited capacity to provide public and documented information. Nevertheless, the bank's benefits may be mitigated by environmental and consumer factors that influence its capacity to attract clients or by the economic conditions of the local market. In this context, the intermediary may possess a significant motivation to offer ongoing financial assistance to firms at risk of defaulting on their obligations (Petersen & Rajan, 1995). In the second scenario, the potential for "capture" pertains to the entire reference region, particularly under severely adverse economic conditions, as local banks are inherently constrained in their capacity for geographical expansion (Gobbi, 2005).

$$\frac{\partial \varphi_i(\cdot)}{\partial I_i} < 0; \quad \frac{\partial \varphi_i(\cdot)}{\partial v_i} > 0; \quad \frac{\partial \varphi_i(\cdot)}{\partial S} > 0, \tag{3.16}$$

Thus, the probability of obtaining a return on loans increases with the level of soft information accuracy and decreases with the idiosyncratic risk component:

$$\frac{\partial \mu(\varphi_i(\cdot))}{\partial \varphi_i} < 0 \quad \frac{\partial\, \mu\,(\varphi_i(\cdot))}{\partial \varphi_i}\frac{\partial \varphi_i}{\partial I_i} > 0 \quad \frac{\partial\, \mu\,(\varphi_i(\cdot))}{\partial \varphi_i}\frac{\partial \varphi_i}{\partial v_i} < 0. \tag{3.17}$$

If you combine eq. (3.12) to (3.15), you get the following CB's Utility function

$$U_i(\bar{L}, \bar{D}) = \frac{\theta L_i^2}{2\beta} + \frac{\eta D_i^2}{2\varepsilon} + \mu\,\frac{(\alpha - \bar{L})}{\beta} L_i + \big((1-\delta)D_i - L_i\big) - \frac{(\bar{D} - \kappa)}{\varepsilon} D_i \tag{3.18}$$

From the maximization of (3.18) respect to loans and deposits we get the reaction functions of each CB in the market.

$$\frac{\partial U_i}{\partial L_i}: \theta L_i + \mu(\alpha - \bar{L}_{-i} - 2L_i) - \beta = 0 \tag{3.19}$$

$$\frac{\partial U_i}{\partial D_i}: \eta D_i + \varepsilon(1-\delta) - (\bar{D}_{-i} + 2D_i - \kappa) = 0. \tag{3.20}$$

Since we assume CBs are symmetric, we have that $\bar{L}_{-i} = (N-1)L_i$ and $\bar{D}_{-i} = (N-1)D_i$

The equilibrium level of Loans and Deposits for each CB is:

$$L_i^{\,*} = \frac{(\mu\alpha - \beta)}{\mu(N+1) - \theta}; \qquad D_i^{\,*} = \frac{\big(\kappa + \varepsilon(1-\delta)\big)}{(N+1) - \eta} \tag{3.21}$$

$$U_i(L_i^{\,*}, D_i^{\,*}) = L_i^{\,*2}\left\{\frac{2\mu - \theta}{2\beta}\right\} + D_i^{\,*2}\left\{\frac{2-\eta}{2e}\right\} \tag{3.22}$$

Let us now compare the equilibrium level of loans granted by the two types of banks.

$$L_{COMM}^{\,*} = \frac{(\gamma\alpha - \beta)}{\gamma(N+1)} \quad ; \quad L_{CB}^{\,*} = \frac{(\mu\alpha - \beta)}{\mu(N+1) - \theta}$$

For the sake of simplicity, we assume that there is no risk (γ=μ=1). When equilibrium is reached, the amount of credit granted will be greater for CBs than for commercial banks if the following condition is met,

$$\frac{N(2+N)}{1+N} < \theta < 1 + N \quad (3.23)$$

Since the left and right sides of condition (3.23) approach the same value, condition (3.23) can be approximated to condition (3.24)

$$\theta \simeq 1 + N \quad (3.24)$$

If we recall that the term θ refers to the weight of members of the CB who borrow from the bank, then condition (3.24) tells us that CBs contribute more to the expansion of local entrepreneurship for certain levels of members and borrowers weighted by the bank. But condition (3.24) tells us even more. This condition is strongly influenced by the number of banks on the market. The greater the competition (measured by the number of banks N), the more strictly the condition must be fulfilled. In other words: In a market with many banks, CBs must behave like borrower-oriented banks in order to grant a higher volume of credit in equilibrium.

In view of our results, we can formulate our theses as follows:

P.1. *For a given weight placed on the CB's Utility component of the surplus of borrowing members, which is positively correlated with the number of banks in the market, cooperative credit banks contribute more to the expansion of local firms by guaranteeing them a higher level of credit in equilibrium.*

P.2 *When the number of banks in the market is high, CBs contribute more to the growth of local firms if they are borrower-oriented banks.*

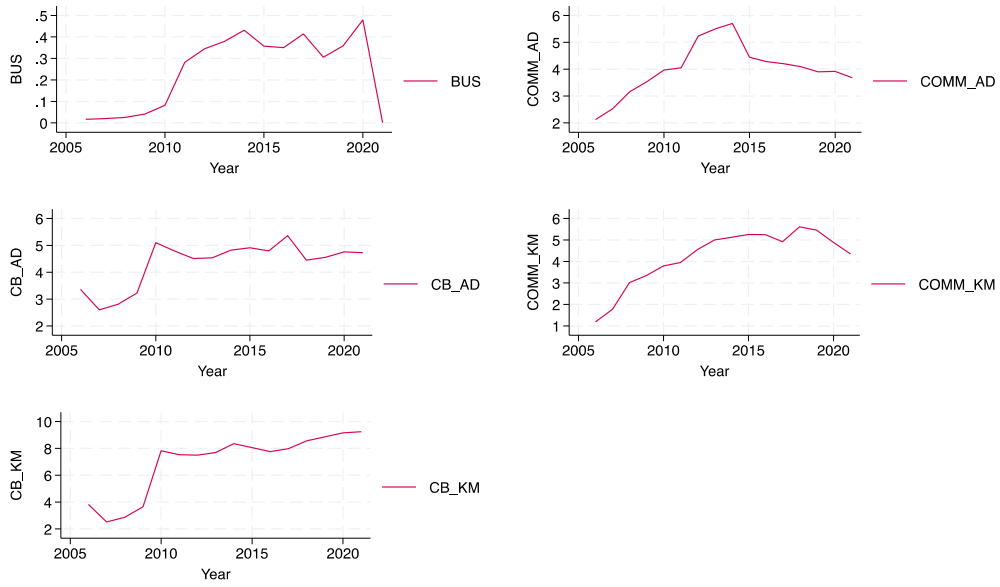
3.9 Application to Developing Economies: Data and Variables

3.9.1 Stylized Facts

We empirically validate the theoretical model's predictions using data from a global, balanced sample of 10 developing countries between 2006 and 2021, taking into account information on two important categories of financial intermediaries: commercial and cooperative.

Before turning to the econometric analysis, it is always important to understand the context. In our case, Figure 3.1 depicts, the timeseries behaviour of entrepreneurship (BUS) (as measured by business density) and financial development (as measured by the number of credit unions and credit cooperative banks per 100.000 inhabitants and per 1.000 km^2 (CB_AD and CB_1000KM2, respectively) - and commercial bank branches per 100.000 inhabitants and per 1.000 km^2 (COMM_AD and COMM_1000KM2, respectively) over the period. We can see that the trends of the variables in question are mostly upward. However, we notice downward spikes in entrepreneurship related to the Covid-19 pandemic, which led to a severe economic crisis that resulted in fewer start-ups being founded.

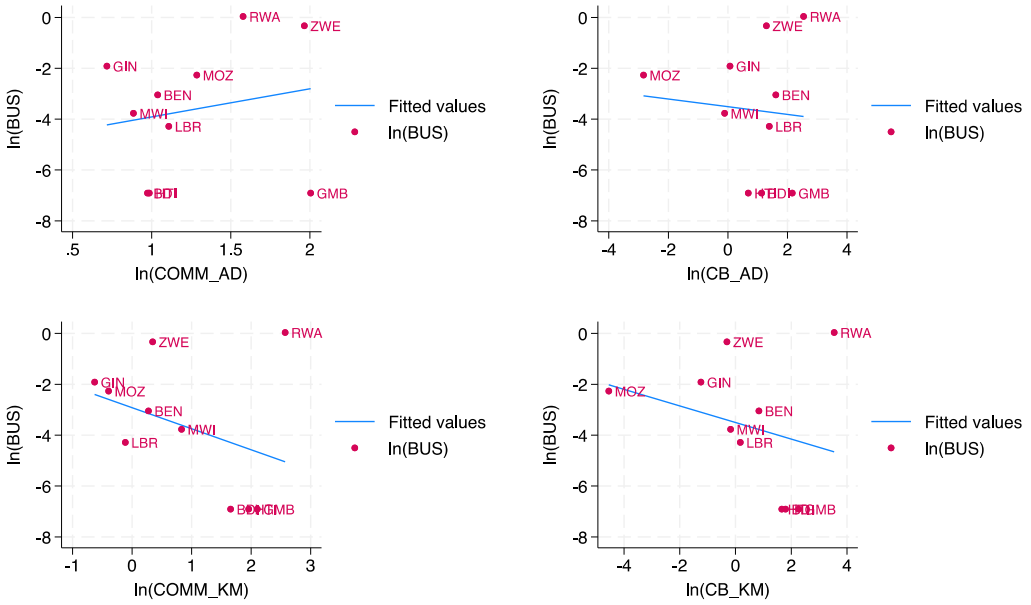
Figure 3.1. Entrepreneurship and Financial Development Timeline



Source: author's elaboration

Figure 3.2 illustrates the relationship between entrepreneurship and financial development country by country. Looking at the number of commercial bank branches per 100.000 adults, there is a strong proportional relationship between these two variables. So countries with higher levels of financial development also have higher levels of entrepreneurship. However, when looking at the number of credit union branches per 100.000 adults, the relationship is slightly negative. In addition, the relationship remains when we look at the number of cooperative and commercial bank branches per 1.000 km^2.

Figure 3.2 Entrepreneurship and Financial Development Diagram (By Region)



BEN: Benin; BDI: Burundi; GMB: Gambia; GIN: Guinea; HTI: Haiti; LBR: Liberia; MWI: Malawi; MOZ; Mozambique; RWA: Rwanda; ZWE: Zimbabwe.

Source: author's elaboration

3.9.2 Summary of Statistics

Table 3.1 provides the definition, the source and the statistics. As expected, low-income countries have a very low level of entrepreneurship (BUS), financial development (i.e. presence of cooperative and commercial bank branches - CBs and COMMBs), credit (CREDITS), deposits (DEP), trade openness (OPN), education

(EDU), per-capita GDP (GDP) and government consumption (GOV) while having very high values of population density (POP) and taxes (TAXES).

Table 3.1 Variables' Definition and Sources

Variable	Label	Definition	Source	Statistics
Entrepreneurship	BUS	number of new business registrations per 1000 people aged 15-64	World Bank World Development Indicators	0.6270
Cooperative Banks and Credit Unions	CBs	Number of credit unions and credit cooperative branches per 100,000 adults	International Monetary Fund (IMF) Financial Access Survey	4.3314
Commercial Banks	COMMBs	Number of commercial bank branches per 100,000 adults	International Monetary Fund (IMF) Financial Access Survey	4.0485
Per-Capita GDP	GDP	Per-Capita GDP at PPP of International US Dollars	World Bank World Development Indicators	700.6620
Trade Openness	OPENESS	Sum of Imports and Exports to Gross Domestic Product	World Bank World Development Indicators	62.6408
Tertiary education enrolment	EDUCATION	Percentage of tertiary education enrolment used to control for educational level	World Bank World Development Indicators	6.4063
Government final consumption expenditure	GOV_CONS	General government final consumption expenditure as a proportion of GD	World Bank World Development Indicators World Bank World Development Indicators	14.5825
Taxes and required contributions	TAXES	Taxes and required contributions levied as a percentage of business profits	World Bank World Development Indicators World Bank World Development Indicators	68.9784
Population Density	POP	population density is measured as people per square kilometer of land area	World Bank World Development Indicators	172.9607
Credits	CREDITS	Volume of credits as percentage of GDP	World Bank World Development Indicators	14.1294
Deposits	DEPOSITS	Volume of deposits as percentage of GDP	World Bank World Development Indicators	21.8875

Author's elaboration; List of countries: Benin, Burundi, Gambia, Guinea, Haiti, Liberia, Malawi, Mozambique, Rwanda, Zimbabwe.

Based on data from the IMF Financial Access Survey, Cooperative and credit unions are more widespread than commercial banks. The number of branches per 100,000 adults is 4.3314 for CBs (credit unions and cooperative bank branches), compared to 4.0485 for COMMBs (commercial bank branches), suggesting that cooperative institutions have a more widespread presence than commercial ones. Cooperative banks and credit unions promote entrepreneurship more than commercial banks because of their deep connection to the community and thus to the area.

3.9.3 Pairwise Correlations Between Variables

The pairwise correlations between the variables utilized in the econometric analysis are shown in Table 3.2 On the one hand, the data confirms the existence of a positive and significant correlation between entrepreneurship (BUS) and both the number of commercial bank branches per 100,000 adults (COMM_AD) and cooperative bank branches per 100,000 adults (CB_AD). This imply that as the number of commercial and cooperative banks per 100,000 adults increases, more people of working age can borrow, thus establishing new businesses and vice versa. We obtain the same results if we consider the number of commercial and cooperative bank branches per 1.000 Km^2 (COMM_KM and CB_KM).

According to the controls incorporated in the model, only the education level of the population (EDU), population density (POP), financial stability (STAB) and bank capital level (ETA) have a positive correlation with entrepreneurship. In contrast openness to foreign trade (OPN), government final consumption expenditure (GOV), taxes (TAXES), bank concentration (CONC) and bank noninterest income to total income (NONLL) have a negative correlation. The rest of the control variables have no significant correlation with our variable of interest.

Table 3.2 Pairwise Correlations

	BUS	TRAD	CRED	DEP	COMM_AD	COMM_KM	CB_AD	CB_KM	OPN	EDU	GDP	GOV	POP	TAXES	LIQ	STAB	CONC	NIM	EFF	NONLL	ETA
BUS	1.00																				
TRAD	-0.20	1.00																			
CRED	-0.08	0.98***	1.00																		
DEP	-0.42	0.96***	0.93***	1.00																	
COMM_AD	0.86***	0.24	0.37	0.03	1.00																
COMM_KM	0.98***	-0.30	-0.17	-0.52	0.82**	1.00															
CB_AD	0.91***	-0.51	-0.40	-0.68*	0.67*	0.92***	1.00														
CB_KM	0.95***	-0.44	-0.32	-0.63*	0.73*	0.97***	0.99***	1.00													
OPN	-0.32	0.97***	0.93***	0.95***	0.11	-0.42	-0.62*	-0.55	1.00												
EDU	0.75**	0.33	0.46	0.15	0.97***	0.71*	0.58	0.62*	0.19	1.00											
GDP	0.90***	0.08	0.20	-0.17	0.83**	0.87***	0.67*	0.76**	-0.05	0.71*	1.00										
GOV	-0.59	0.89***	0.83**	0.96***	-0.18	-0.67*	-0.79**	-0.76**	0.94***	-0.06	-0.33	1.00									
POP	0.74**	-0.75**	-0.67*	-0.89***	0.34	0.81**	0.85**	0.86***	-0.82**	0.19	0.58	-0.94***	1.00								
TAXES	-0.87***	-0.14	-0.26	0.07	-0.93***	-0.84**	-0.63*	-0.71*	-0.02	-0.87***	-0.87***	0.29	-0.44	1.00							
LIQ	-0.45	0.95***	0.91***	1.00***	-0.00	-0.55	-0.70*	-0.66*	0.95***	0.12	-0.20	0.97***	-0.91***	0.10	1.00						
STAB	0.86***	-0.63*	-0.52	-0.77**	0.52	0.88***	0.89***	0.91***	-0.69*	0.35	0.70*	-0.88***	0.94***	-0.60*	-0.79**	1.00					
CONC	-0.90***	0.07	-0.04	0.33	-0.82**	-0.93***	-0.75**	-0.83**	0.20	-0.74**	-0.91***	0.49	-0.68*	0.90***	0.36	-0.73*	1.00				
NIM	0.58	-0.78**	-0.72*	-0.85***	0.14	0.62*	0.66*	0.66*	-0.77**	-0.04	0.44	-0.88***	0.89***	-0.31	-0.86***	0.88***	-0.47	1.00			
EFF	-0.49	0.08	0.04	0.28	-0.31	-0.50	-0.40	-0.47	0.04	-0.15	-0.62*	0.24	-0.47	0.29	0.29	-0.50	0.55	-0.44	1.00		
NONLL	-0.80**	0.51	0.45	0.72*	-0.47	-0.85**	-0.76**	-0.81**	0.57	-0.33	-0.73*	0.77**	-0.91***	0.63*	0.73*	-0.88***	0.83**	-0.82**	0.60	1.00	
ETA	0.94***	-0.31	-0.19	-0.50	0.77**	0.95***	0.87***	0.91***	-0.40	0.62*	0.85***	-0.67*	0.79**	-0.80**	-0.53	0.92***	-0.84**	0.67*	-0.51	-0.80**	1.00

* $p<0.1$; ** $p<0.05$; *** $p<0.01$.
Source: author's elaboration

3.10 Empirical Design

3.10.1 Dealing with Endogeneity: IV-H Regression

The main threat to an accurate estimation of the relationship between entrepreneurship and financial development arises from the likelihood of endogeneity of the relationship due to omitted variables or reverse causality, which is a major shortcoming of the OLS and FE approaches. In this sense, localities may have a higher density of firms for reasons other than financial development. In rare cases, reverse causality can confuse the conclusions. Indeed, financial development has an impact on entrepreneurship, but the opposite can also be true. For example, we hypothesise that greater entrepreneurship affects financial development, for example through higher demand for credit to support business start-ups (implying greater financial depth) and other financial services (implying better access to financial services). Endogeneity may also exist due to biases from omitted variables and measurement error.

To address these issues and remove them from our estimation, we use the instrumental variable (IV) approach developed by Lewbel (2012). This method is especially useful when no externally based instruments are available (see Arcand et al., 2015; Dutta & Meierrieks, 2021). Importantly, it allows for the simultaneous creation of multiple instruments (according to the number of parameters associated with the underlying regression model). This technique is unique in that. It allows the identification of structural parameters in regression models with endogenous or mismeasured regressors in the absence of typical identifying information such as external instruments or repeated measures.

The estimator specifically uses heteroskedasticity to identify and estimate mismeasured and endogenous regressor models. This procedure can be formalized as follows:

$$ln(BUS)_{i,t} = \beta_0 + \beta_1 ln(FD)_{i,t} + \sum \varphi \ln(Z)_{i,t} + \gamma_i + \tau_t + \varepsilon_{i,t,1} \quad (3.25)$$

$$ln(FD)_{i,t} = \beta_0 + \sum \omega \ln(Z)_{i,t} + \gamma_i + \tau_t + \varepsilon_{i,t,2} \quad (3.26)$$

where equation (3.25) represents the second-stage regression and equation (3.26) is the first-stage regression, whereas *Z* are utilized as internal instruments to address the issue of endogeneity.

BUS denotes the proxy for entrepreneurship, measured by the number of new business registrations per 1000 people aged 15-64. FD represents the proxy for financial development, measured by the number of commercial banks per 100,000 adults (COMM_AD) or cooperative banks and credit unions per 100,000 adults (CB_AD) (Source: International Monetary Fund (IMF) Financial Access Survey). Z is the vector of controls, which includes important environmental factors such as: GDP, per-capita gross domestic product in 2015 constant US Dollars; OPN, trade openness is measured as the sum of imports and exports of goods and services in relation to GDP in order to account for a country's level of internationalization. EDU, the percentage of tertiary education enrolment used to control for educational level. GOV, general government final consumption expenditure as a proportion of GDP, adjusted for government size. TAXES, Taxes and required contributions levied as a percentage of business profits to offset the impacts of fiscal burden. POP: population density is measured as people per square kilometer of land area to adjust for demographic influences. All these variables were dawn by World Bank - World Development Indicators. We also include seven financial factors in the regressions capturing other financial conditions able to influence the entrepreneurship activity. These are: LIQ: variable connected to liquid liabilities in millions USD (2010 constant); STAB: variable related to financial stability (determined using the widespread indicator of Z-score. It captures the probability of default of a country's commercial banking system. Z-score compares the buffer of a country's commercial banking system (capitalization and returns) with the volatility of those returns). CONC: a variable pertaining to bank concentration, i.e., assets of three largest commercial banks as a share of total commercial banking assets (Total assets include total earning assets, cash and due from banks, foreclosed real estate, fixed assets, goodwill, other intangibles, current tax assets, deferred tax assets, discontinued operations and other assets). NIM: variable related to bank net interest margin (proxy for bank earnings) (Accounting value of bank's net interest revenue as a share of its average interest-bearing (total earning) assets). EFF: variable related to bank

cost to income ratio (%) (proxy for banking operational efficiency) (Operating expenses of a bank as a share of sum of net-interest revenue and other operating income). NONLL: variable related to Bank noninterest income to total income (%) (Bank's income that has been generated by noninterest related activities as a percentage of total income (net-interest income plus noninterest income). Noninterest related income includes net gains on trading and derivatives, net gains on other securities, net fees and commissions and other operating income.). ETA: variable pertaining to bank capital level (as measured by bank capital and reserves to total assets) (Capital and reserves include funds contributed by owners, retained earnings, general and special reserves, provisions, and valuation adjustments. Capital includes tier 1 capital ,paid-up shares and common stock), which is a common feature in all countries' banking systems, and total regulatory capital, which includes several specified types of subordinated debt instruments that need not be repaid if the funds are required to maintain minimum capital levels (these comprise tier 2 and tier 3 capital). Total assets include all nonfinancial and financial assets). All of these financial indicators are extracted from "The Global Financial Development Indicators (GFDI)"[9] compiled by Beck et al. (2000), Beck et al. (2009) and Cihák et al. (2012). All of these variables are inserted logarithm form into the regressions.

This aims to determine whether certain financial mechanisms have a disproportionate impact on entrepreneurship. Furthermore, this exercise allows us to determine if these financial variables influence the financial development-entrepreneurship nexus. In all regressions, time dummies (τ) are included in order to control for omitted variables and cyclical factors (such as financial and public debt crisis). Are also included country dummies (γ) that allow us to grasp the heterogeneity of the sample. Standard errors are clustered at country level. Finally, the subscripts i and t are the countries (i=1, …, 10) and t the time interval (t=1, … ,16) respectively, while ε denotes the error term.

[9] The Global Financial Development Database is a comprehensive dataset of 214 economies' financial system features. It covers annual data beginning in 1960. It contains data for 108 indicators covering various elements of financial institutions and markets.

In general, this technique is identified when regressors are uncorrelated with the product of heteroskedastic errors, which is a property of many models where error correlations are caused by an unobserved common factor. Then, here we assume the moments $Cov(Z, \varepsilon_1 \varepsilon_2) = 0$ as instruments.

Essentially, the presence of heteroskedasticity in regression residuals is used to construct a set of internal instruments capable of identifying causal linkages even when sufficiently strong and believable external instruments are not available (Rigobon, 2003; Lewbel, 2012). In other words, it avoids the methodological and conceptual challenges that are commonly associated with the identification and justification of external instruments.

The Hansen test for instrument validity (over-identification constraints) results are also presented. Failure to reject the null hypothesis of joint validity of the instruments means that the chosen instrument set is exogenous. The first-stage F-statistic is also presented to assess instrument weakness; an F-statistic greater than 10 indicates a sufficiently powerful combination of instruments. Finally, C-statistics are given.

3.10.2 IV-H. Baseline Results

In Table 3.3, we use the IV estimator suggested by Lewbel (2012) on developing nations, i.e. low-income countries. In this table we distinguish six different specifications. In regression (1), it is shown that the impact of the number of cooperative bank branches per 100,000 adults is positive and statistically significant, just like the impact of openness to international trade. This imply that as the distribution of cooperative banks within society increases (particularly among people of working age), so does entrepreneurship - a 1% increase in the number of cooperative bank branches is associated with an increase of approximately 0.55% in entrepreneurial activity (Dutta & Meierrieks, 2021; Beck & Demirguc-Kunt, 2006, 2008; Acs & Audretsch, 1990; Aghion & Howitt, 1990; Fujita et al., 2001).

This result stems from the unique governance structure of cooperative banks. It ensures a strong connection to the community and the local area, while also limiting their operations to well-defined geographic regions. This characteristic enables cooperative banks to develop a detailed understanding of their clients and their

financial requirements. Such proximity allows for a more accurate and individualised assessment of credit risk (Birchall & Ketilson, 2009; Bunger, 2009; Coccorese & Shaffer, 2021).

Consequently, these institutions are able to design loan conditions that are more flexible and better aligned with the specific circumstances of prospective entrepreneurs. This effect is significantly enhanced with increased openness to international trade. Regions with extensive foreign trade connections gain access to a substantially larger market. A 1 percentage point increase in trade openness is associated with an increase of approximately 1.13% in entrepreneurship. This implies not only in increased revenue but also greater opportunities for exploitation, thereby addressing more community needs through the establishment of new enterprises (Moore et al., 2021). This variable is highly significant across all six parameters, indicating that its influence on entrepreneurship is crucial. Taxes have a negative and statistically significant value in regressions (1), (3), (4) and (6), where regressions (3) and (6) are the most important because they consider the number of credit unions and cooperative and commercial bank branches per 100,000 adults and the number of credit unions and cooperative and commercial bank branches per 1000 km2 simultaneously. Specifically, a 1 percentage point increase in the tax burden is associated with a decline in entrepreneurship ranging from −0.55% to −0.66%. The effect of taxes is simple: if taxes increase in each locality, there is a disincentive to start new businesses, as the entrepreneur will have to pay more taxes to the state (Bruce et al.,2020).

In terms of regression (2), we can see that, while foreign market openness is a robust and positive predictor of entrepreneurship, the number of commercial bank branches per 100,000 people is positive but very insignificant.

However, the latter conclusion is completely inverted in regression (3). Here the number of credit unions and cooperative and commercial banks per 100,000 adults is both positive and highly significant. Specifically, a 1% increase in the number of cooperative bank branches and commercial bank branches leads to an increase in entrepreneurial activity of approximately 0.505% and 0.41%, respectively. This highlight that cooperative banks have a stronger impact respect to the commercial banks in this context. This means that the more the two types of banks are distributed

in society, the greater the number of registered businesses. So, in addition to the effect of credit unions and cooperative banks described above, we have the effect of commercial banks. The latter contribute to the development of entrepreneurship due to their larger size and greater willingness to take risks. However, due to the greater proximity of cooperative banks to society and their ability to offer financial instruments that are more adaptable to the needs of their clientele, they have a greater impact on entrepreneurship (Jaffee & Levonian, 2001).

We can also confirm the result and impact of the openness of international trade and taxes, but there is also a negative and statistically significant impact of bank concentration. A 1% increase in banking market concentration is associated with a decrease in entrepreneurship of approximately 0.5%. In highly concentrated banking systems, a limited number of large institutions dominate financial intermediation, gaining greater market power. This translates into higher interest rates and fees. This creates less favorable lending conditions for borrowers, especially small businesses and startups. Furthermore, large banks rely on standardized lending technologies based on objective informations, such as financial statements and formal risk assessments. While these models improve efficiency, they are less effective in evaluating projects without a credit history. In contrast, smaller, more localized financial institutions tend to rely on qualitative information, including personal relationships. Theoretically, this mechanism is consistent with the literature on credit rationing (Stiglitz & Weiss, 1981). This literature argues that information asymmetries can lead banks to limit lending even in the presence of profitable investment opportunities. In concentrated markets, reduced competition can further amplify this effect. Indeed, dominant banks have fewer incentives to extend credit to riskier or less conventional borrowers. Furthermore, less competition reduces the incentives for banks to innovate in their lending practices or adapt financial products to the needs of different business activities. Consequently, the allocation of credit becomes more skewed toward larger, more established firms (Bergantino & Capozza, 2012).

In general, none of the seven new bank variables had a significant impact on our variable of interest. This is due to a number of problems characterised by the countries' economic, social and political circumstances, such as a lack of financial

resources, a shortage of credit, and regulatory and bureaucratic inefficiencies. As far as financial resources are concerned, these are extremely scarce in developing countries due to the lack of a properly consolidated financial system.

There is also a lack of credit in these countries because borrowers have no collateral (Lepojevic et al., 2016). This is exacerbated by the bureaucratic and regulatory framework in which the majority of these countries find themselves. The legislative and bureaucratic structure frequently has several flaws, such as very complex and lengthy registration processes. It obviously impede and discourage the formation of new firms (Iakovleva et al., 2011).

The same results are found for regressions (4), (5), and (6), but this time they are connected to the number of credit unions and cooperative and commercial bank branches per 1,000 km2. As a result, we may conclude that the distribution of banks within the area and society has an important influence in the growth of entrepreneurship with cooperative banks having a greater impact.

The lower part of the table presents the tests for the validation of method IV. The Hansen test confirms the validity of the instruments used (p-values greater than 0.10). The F-statistic rules out instrument weakness (values greater than 10 threshold points, as a rule of thumb). These two diagnostic tests would show that there are no endogeneity difficulties with the IV estimator (Rigobon, 2003; Lewbel, 2012).

Table 3.3 Entrepreneurship and Financial Development (IV-H Regression)

Regressors	(1)	(2)	(3)	(4)	(5)	(6)
CB_AD	0.559		0.505			
	[0.108]***		[0.102]***			
COMM_AD		0.419	0.410			
		[0.272]	[0.177]**			
CB_1000KM2				0.607		0.579
				[0.093]***		[0.094]***
COMM_1000KM2					0.447	0.099
					[0.247]*	[0.158]
GDP	0.327	0.415	0.326	0.291	0.384	0.294
	[0.276]	[0.326]	[0.256]	[0.243]	[0.324]	[0.240]
OPN	1.130	0.724	0.942	1.157	0.696	1.108
	[0.220]***	[0.289]**	[0.232]***	[0.193]***	[0.286]**	[0.213]***
EDU	-0.517	0.465	-0.319	0.274	0.452	0.295
	[0.314]*	[0.246]*	[0.279]	[0.208]	[0.241]*	[0.206]
GOV	-0.193	-0.277	-0.113	-0.457	-0.343	-0.434
	[0.358]	[0.615]	[0.357]	[0.307]	[0.608]	[0.309]
TAXES	-0.615	0.419	-0.556	-0.659	0.379	-0.619
	[0.258]**	[0.257]	[0.264]**	[0.227]***	[0.263]	[0.228]***
POP	-0.183	-0.018	-0.179	-0.162	-0.087	-0.170
	[0.223]	[0.275]	[0.216]	[0.190]	[0.281]	[0.189]
LIQ	-0.516	0.001	-0.399	-0.289	0.077	-0.250
	[0.313]*	[0.377]	[0.310]	[0.269]	[0.380]	[0.273]
STAB	-0.274	-0.163	-0.340	-0.256	-0.177	-0.265
	[0.292]	[0.331]	[0.293]	[0.254]	[0.325]	[0.256]
CONC	-0.320	-0.525	-0.357	-0.273	-0.519	-0.276
	[0.241]	[0.234]**	[0.237]	[0.205]	[0.231]**	[0.211]
NIM	-0.231	-0.015	-0.231	-0.269	-0.048	-0.283
	[0.171]	[0.162]	[0.170]	[0.148]*	[0.164]	[0.154]*
EFF	-0.474	0.308	-0.301	-0.324	0.344	-0.262
	[0.298]	[0.281]	[0.289]	[0.246]	[0.273]	[0.260]
NONLL	0.128	0.111	0.095	0.090	0.099	0.083
	[0.150]	[0.158]	[0.140]	[0.120]	[0.158]	[0.119]
ETA	0.297	0.803	0.348	0.279	0.812	0.298
	[0.322]	[0.549]	[0.336]	[0.270]	[0.538]	[0.271]
TIME FE	YES	YES	YES	YES	YES	YES
HANSEN (p)	0.121	0.293	0.333	0.343	0.176	0.361
C-STAT (p)	0.517	0.157	0.593	0.897	0.185	0.989
F-STAT (FIRST STAGE CB_AD)	18.79		59.25			
F-STAT (FIRST STAGE COMM_AD)		18.52	29.66			
F-STAT (FIRST STAGE CB_1000KM2)				19.59		68.27
F-STAT (FIRST STAGE COMM_1000KM2)					17.59	47.89
R^2	0.889	0.846	0.895	0.914	0.850	0.914
N	119	115	115	119	115	115

* $p<0.1$; ** $p<0.05$; *** $p<0.01$

Source: author's elaboration

3.11 Conclusions and Discussion

3.11.1 Discussion

In this paper we provide answers to two important research questions: Is financial development beneficial for the emergence of new businesses? Is banking diversity necessary for financial development and entrepreneurship?

We employ a simple framework of strategic interaction between two distinct categories of banks that comprise the credit system: commercial banks and cooperative credit banks, in an effort to address our two research questions. We demonstrate that the quantity of equilibrium credit is significantly influenced by the distinct structural objectives of the two distinct types of credit institutions. We find that in a market with many banks, if CBs behave like borrower-oriented banks, they grant a higher volume of credit in equilibrium and help small and medium enterprises to grow. In other words, cooperative credit banks contribute more to the expansion of local firms by guaranteeing them a higher level of credit in equilibrium.

We conducted an empirical analysis on the impact of financial development on entrepreneurship in 10 countries (developing countries) from 2006 to 2021, using data from two broad categories of financial intermediaries: commercial and credit unions and cooperative banks. Based on the IV-H estimator, the empirical evidence confirms the importance of both financial intermediaries in supporting entrepreneurship, with cooperative banks showing a higher intensity than their counterparts. The contribution to the literature is to (i) provide causal estimates of the impact of financial development on entrepreneurship using an instrumental variable approach that exploits the heteroscedasticity of the regression residuals, and (ii) consider a context of diversity with two coexisting financial intermediaries. The results confirm both theoretically and empirically that cooperative banks better promote entrepreneurship, particularly when low-income countries are considered. Our findings can be explained by the fact that cooperative banks are closely linked to the area and community in which they operate. Their democratic governance, based on the principle of “one member, one vote”, and their mutualistic objective allow for a better understanding of local needs. In low-income countries, information asymmetries and local idiosyncratic risks are particularly high. These

conditions enable CBs to evaluate entrepreneurial projects more effectively. They can also mitigate default risk and extend credit when commercial banks are unwilling to assume such risks. The scarcity of financial resources further constrains access to credit. Commercial banks tend to concentrate on safer clients or more profitable projects. In this context, CBs are able to lend more efficiently to small businesses and start-ups. In addition, the role of CBs is enhanced when combined with other factors such as openness to international trade and education. To summarise, the results confirm the findings of Schumpeter (1934) and others that a functioning banking sector can promote entrepreneurial activity at the national level. Indeed, financial development promotes entrepreneurship, for example, by alleviating liquidity constraints, reducing intermediation costs, and improving risk and information management, resource allocation, and savings mobilisation (Dutta & Meierrieks, 2021).

3.11.2 Conclusion and Policy Implications

Entrepreneurship is a key driver of economic growth and job creation (Stel et al., 2005), and as such it requires a sound financial infrastructure to thrive. Commercial banks primarily pursue profit maximization, exploiting the differential between the interest rates applied to loans and those offered on deposits. Cooperative banks and credit unions, on the other hand, adopt a broader set of objectives. While they must also remain financially sustainable, their primary purpose is not limited to profit generation. Rather, they aim to improve the quality and accessibility of services offered to their members. This orientation leads them to focus on the quantity, pricing, and diversity of financial products, ensuring they are tailored to the needs of their communities. Particular attention is paid to financing individuals and small and medium-sized enterprises (SMEs), which often face greater difficulties in obtaining credit from commercial banks (Coccorese & Shaffer, 2021). Our findings emphasise the crucial role of the financial sector in the creation and support of start-ups and, unlike other contributions, the added value of bank diversity. Consequently, policy makers should make every effort to support financial innovation and advocate for better access to international capital markets. Improved access to global markets, according to studies such as Chinn & Ito (2006), can promote investment and

stimulate business growth. This means that the cross-border movement of capital should be facilitated.

Better access to foreign capital markets helps ease the constraints imposed by limited domestic savings capacity. In economies characterized by low levels of deposits and domestic accumulation, the inflow of foreign resources broadens the funding base of the financial system. It reduces credit scarcity and allows for greater financing of businesses and productive projects. Secondly, the internationalization of funding sources reduces the cost of capital and improves risk diversification. In this regard, a wider range of investors and instruments tends to compress the risk premium and promote the international sharing of shocks. This strengthens the system's ability to support inherently riskier business ventures. A further channel concerns the effects of discipline and institutional upgrading. Openness to international financial markets can play a crucial role in improving the quality of national financial systems. Integration with global financial markets exposes companies to foreign investors. This situation requires higher standards of transparency and disclosure. Consequently, countries are incentivized to adopt more rigorous accounting standards and strengthen reporting requirements in order to attract foreign capital. This process can be interpreted as a form of market discipline, in which international investors pressure national institutions to improve their credibility and reliability. Furthermore, financial openness helps to reduce information asymmetries by introducing global benchmarks, more precise auditing practices and credit rating mechanisms. This leads to more accurate risk assessments and reduces the information frictions that typically hinder financial intermediation. Exposure to international markets often requires improvements in the quality of regulation and supervisory practices. Governments are encouraged to strengthen financial supervision and align national regulations with international standards. This improves the stability and efficiency of the financial system. This process can be particularly beneficial for developing economies, where institutional frameworks may be less mature. With regard to financial innovation, it can influence entrepreneurial activity through multiple channels. Firstly, it helps to reduce transaction costs through the adoption of digital payment systems, remote distribution channels and low-cost products. This increases effective access to

financial services and brings potential entrepreneurs into the banking system. It happen especially in contexts where physical distance and fixed intermediation costs are a significant constraint. Financial innovation also affects banking competition and diversity. Promotes also the entry of new players and digital platforms into the market. As a result, traditional barriers in the credit market are reduced and increased competition encourages commercial banks to extend financing to smaller businesses as well. In this way, they move closer to the relationship-based approach typical of cooperative banks. Furthermore, it leads to greater international financial integration. In fact, it expands the available funding base as more advanced instruments facilitate access to foreign capital. In addition, financial innovation can also produce institutional effects as it requires higher standards of transparency, reporting, investor protection and regulatory quality. This occurs because it changes the traditional mechanisms of financial intermediation. In particular, we may see a shift from forms of financing based on direct relationships (typical of traditional banking) to more disintermediated and digital methods. In such contexts, direct knowledge of the borrower (soft information) is replaced by codified and standardized information (hard information). This makes the availability of accurate, comparable and verifiable data essential. In the absence of adequate information standards, investors are unable to distinguish between high- and low-risk projects. Consequently, this would lead to an increase in information asymmetries, adverse selection, and credit rationing (George Akerlof, 1970; Stiglitz & Weiss, 1981). Furthermore, given the growing complexity of financial instruments and the participation of foreign investors, we could no longer rely on risk assessment based exclusively on fiduciary relationships. In this case, sophisticated information systems and credible institutions must be adopted. In this regard, La Porta et al. (1998) argue that the quality of investor protection and enforcement mechanisms is fundamental to the development of financial markets in the presence of complex and innovative instruments. In this way, financial innovation helps strengthen the entire institutional framework within which banks and firms operate. However, if not adequately regulated, it can increase interconnections and systemic risks, amplifying contagion and instability. In this sense, financial innovation does not automatically guarantee greater system

efficiency, but requires a regulatory framework capable of supporting and governing it. Finally, the development of more flexible financial instruments and contracts can increase the financeability of young and innovative companies, which are often excluded from standardised bank lending models. This chapter highlights the importance of banking diversity in promoting entrepreneurship. Cooperative banks and credit unions substantially outperform commercial banks in promoting the establishment of new enterprises. Cooperative banks play a significant role in the national banking market. Therefore, public policy should consider their unique characteristics and advantages promoting the most efficient structure for the banking system. The presence of small, decentralised banks in regional areas, particularly cooperative banks, can help prevent the outflow of local financial resources and encourage a widespread economic development. This would strengthen the effectiveness of the financial sector as a whole and offer more opportunities for loans to people who want to start a new business. A proactive policy and the presence of different financial institutions are essential for sustained economic growth and increased entrepreneurship.

In this context, the local roots and mutualistic orientation of cooperative banks facilitate relationship-based lending and the production of soft information. This allows for a more accurate assessment of borrower quality and project feasibility, despite significant information frictions and higher idiosyncratic risks. As a result, these institutions can offer more flexible and tailored lending terms, easing the liquidity constraints that typically hinder start-up creation. At the same time, banking diversity mitigates the negative effects of market concentration. Indeed, in highly concentrated systems, large banks tend to rely on standardised lending models that neglect local characteristics and increase the cost of credit. This discourages entrepreneurship. Therefore, supporting a diversified financial ecosystem in which cooperative banks coexist with commercial intermediaries strengthens the effectiveness of the financial sector and promotes economic growth supported by broader opportunities for business creation.

We are aware of the limitations of this analysis, particularly with regard to the data set, which is primarily focussed on developing countries. We will extend the analysis to industrialised countries as we are convinced that some results will be

equally meaningful. For example, as the European Association of Cooperative Banks emphasises: “Cooperative banks are essential for strengthening Europe's regional economy, improving its financial and capital markets, enhancing its global strategic autonomy and financing Europe’s sustainable and digital goals” (2024) . In fact, based on data from Italian municipalities, Coccorese & Shaffer (2021), show that cooperative banks are more effective than commercial banks and performs a unique role in improving local economic performance. They also note that the effect is strongest in the fields of income, employment, and firm birth growth rates.

As a limitation within the chapter, we certainly recognise that one is the proxy for financial development that represents business density, i.e. the number of new business registrations. In fact, in developing countries, a significant proportion of economic activity is informal and may not appear in official records. This may attenuate or distort the estimated relationship, because the effects of finance could also manifest themselves as a transition from informal to formal (or remain invisible in the data). Furthermore, it is plausible that the impact of branches on business creation is not simultaneous, whereas in our empirical framework, the estimated relationship is mainly simultaneous. In addition, we also know that finance may have decreasing returns or non-monotonic effects. In this chapter, however, the effect is estimated in linear form, so if thresholds exist, the estimated coefficients could be misleading.

In future research, other methods such as “quantile regression” (to analyse the impact of financial development on entrepreneurship at different points of the conditional distribution) and the “error correction model” (to analyse the short-run and long-run impact of financial development on entrepreneurship) could be used to investigate the relationship between financial development and entrepreneurship.

As a further avenue for future research, we intend to assess the role of institutional quality in shaping the link between financial development and entrepreneurship. In particular, the effect may not be uniform across countries, but may vary systematically according to different levels of institutional quality, such as the effectiveness of the legal system, the protection of property rights, the quality of regulation and the fight against corruption. In weaker institutional contexts, financial intermediation may be less effective in supporting the creation of

productive enterprises due to greater information frictions. Conversely, in stronger institutional contexts, the same degree of financial development may translate more efficiently into credit allocation and entrepreneurial dynamism. Furthermore, we intend to enrich the framework by including lagged values of the main explanatory variable, as the impact of banking development on new business formation may be delayed. The expansion of financial infrastructure and the banking network may take time to translate into effective credit relationships and information accumulation. The integration of lags will allow for a more accurate identification of the timing and persistence of the estimated effects. In addition, consideration of other cyclical, market, socio-economic, political and institutional factors would help to identify potential processes that could explain the mechanisms underlying the influence of financial development on entrepreneurship.

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