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Banking development and corporate financial policies
The game-changing role of FinTech and globalization

Settore Scientifico Disciplinare SECS / P08

Direttore: Ch.mo Prof Franco Rubino

Supervisore: Ch.mo Prof. Maurizio La Rocca

Dottorando: Dott. Francesco Fasano

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Abstract of the thesis

Banks are the engine of firm growth and the extant literature suggests that the local banking development, in terms of geographical concentration of bank branches and proximity to the customers, matters to corporate financial policies, especially for SMEs. However, new financial technology and globalization of financial markets could threaten the relevance of local bank branches. The present thesis studies two new issues in this field of research and investigates whether FinTech and the international integration of financial markets shape the effect of local banking institutions on firm value creation processes. Results reveal that banking integration and banking digitalization mitigate the role of local banking development. However, the bank-entrepreneur relationship is still important and fosters the provision of bank credit, which represents the fuel that feeds the firm growth.

Introduction of the thesis

Cash is king. This expression is widely used in corporate finance and denotes the importance of cash flow as crucial driver of firm value. Indeed, cash is essential to catch growth opportunities that represent the most important dimension of corporate value[1]. Hence, firms use cash to undertake new profitable investments, which are fundamental to sustain their growth. Such cash can be generated through internal savings or external funding. With this regard, banks play a central role, as they allocate funds from savers to borrowers. Most of the European countries are bank-based economies, where banks represent the main financial institutions and play a crucial role in entrepreneurial growth (Fraser et al., 2015). As a result, bank debt is the single most important source of financing for European firms. Considering the relevance of banks, the financial literature studied the banking phenomenon in several respects, and the banking-firm relationship became a hot topic in the corporate finance literature. In this context, an interesting stream of research regards the role of the banking development on corporate financial policies[2]. Banking development is intended as the development of a particular set of financial institutions, i.e. banks that, among other functions, provide short, medium and long-term finance to both the private and the public sector. The role of the banking development is thus very important, as "developed financial markets grant firms easier access to external funds" (Guiso et al. 2004) fostering corporate growth (Demirguc-Kunt and Maksimovic 1998). The extant literature studied banking development paying particular attention to small and medium sized enterprises (SMEs), which have a main role in the economic growth as they represent 99% of businesses in the European Union[3]. According to the European Commission definition, SMEs are those firms having the following characteristics: employees fewer than 250 persons, annual turnover lower than EUR 50 million and/or annual balance sheet total not exceeding EUR 43 million. The relationship between

1 Firm value is the combination of assets in place and growth opportunities (Myers 1984). However, while assets in place become obsolete, growth opportunities allow firms to look ahead and create value in the long run.
2 The three most important dimensions of corporate financial policies are: debt, cash holdings and trade credit (Brealey 2012)
3 https://ec.europa.eu/growth/smes/sme-definition_en

banks and SMEs is particularly important, as the latter are informationally opaque businesses that have a difficult access to external financial resources due to asymmetric information problems (Almeida et al. 2004; Berger and Udell 1998). SMEs financial difficulties depend on the fact that they often do not have public balance sheets available, for which banks in turn do not have enough information about them and, consequently, the risk of the loans cannot be easily quantified. Additionally, SMEs typically do not have adequate collateral to provide as guarantee of their loans.

The existing financial literature investigated the banking development both at the national and at the local level. The first streams of research in this field focused on the development of the national banking systems, observing a positive influence on corporate financial policies (Utrero-Gonzàlez 2007; Giannetti 2003; Rajan and Zingales 1998, 2001; Mayer 1990), also for SMEs. (Chittenden et al. 1996). These authors highlight how well-performing national banking markets increases the availability of debt, as the efficiency of the banking system reduces the cost of external finance and mitigates problems of asymmetric information through personal relationships between the bank and the firm. A subsequent stream of investigation, starting from the work of Guiso et al. (2004), observed that despite contemporary globalisation also the local banking sector has a positive effect on firms financial policies, especially for SMEs (Palacín-Sánchez and Di Pietro 2016; Deloof and La Rocca 2015; La Rocca et al. 2010; Alessandrini et al. 2009; González and González 2008; Utrero-González, 2007; Beck et al. 2005; Pollard 2003; Petersen and Rajan 2002). These studies focus on a single country setting of analysis, interestingly observing that each local (provincial or regional) banking market has a different degree of development that could differently affect corporate financial choices. More in detail, they evidenced that the closeness between the bank and the SME, which is an important measure of banking development, mitigates asymmetric information problems. Indeed, the bank-SME proximity allows local banks to provide credit to SMEs based on soft information obtained through personal contacts with the firm, reducing information asymmetries. In this context of information asymmetries the new financial technologies (FinTech) is playing a breakthrough role, revolutionizing the banking world. Indeed, the information collection procedures completely changed with the advent of FinTech, which is though base on hard quantifiable information.

New digital technologies in banking represent a fascinating new opportunity to develop the way banks process information, without overlooking the importance of personal bank-entrepreneur human interactions in the collection of 'soft' information (Jakšič and Marinc, 2019).

Notwithstanding such academic interest generated a huge body of contributions, there are some questions that have not been deepened from the existing articles. The aim of this PhD thesis is to contribute to the existing literature studying new issues on the bank-SME relationship. The thesis consists of four empirical chapters, each of which responds to a new essay in the banking development research. The following Figure 1 synthesizes the story-line of the thesis:

<table>
<tr><td colspan="2">Does local banking development matter on SMEs financial policies?</td></tr>
<tr><td>Chapter 1
Local Banking Development and Cash Holdings in Italian SMEs</td><td>Chapter 2
Banking Relationship and Research Spin-offs' life cycle: the Italian experience</td></tr>
<tr><td colspan="2">Is local banking development still relevant….</td></tr>
<tr><td>… considering the advent of digitalization and new financial technologies?</td><td>… considering the internationalization and integration of financial markets?</td></tr>
<tr><td>Chapter 3
Does Local Banking Development Still Matters? The game-changing role of FinTech</td><td>Chapter 4
National versus Local Banking development. Who is the Winner? A European within-country empirical analysis</td></tr>
</table>

The first chapter focuses on the relationship between local banking markets and SME cash holdings, which are vital to invest in new business projects. The setting of study is Italy, a country where there are significant differences in banking development across Italian provinces. My results suggest that the higher the development of the banking institutions, the lower the cash SMEs hold. It seems that when SMEs have an easier access to external funds, they do not feel the need to accumulate cash buffers. This occurs only for those SMEs using bank debt and only for younger and smaller SMEs, which are more sensitive to information opacity problems. Moreover, my empirical evidences underline that the role of local banking development is stronger during crisis periods, providing important implications for policy-makers during this particular COVID-19 period, during which firms are in urgent need of cash resources.

The second chapter studies the role of local banking institutions during research spin-offs life-cycle, which are special SMEs created within Universities that create economic growth and wealth through innovation and product development. The findings, based on Italy, highlight that local banking institutions do not matter to research spin-offs performance during the incubation phase (when the main source of funding comes from public contributions), but only in the following stages of the life-cycle when the firm enters the market and public resources are no longer available.

The third chapter investigates whether the growth of FinTech shapes the effect of local banking development on SMEs financial policies. The results highlight that FinTech reduces the effect of local banking institutions on SMEs use of debt only for national bank branches and not for cooperative bank branches. This is because cooperative banks, differently from national ones, base their lending decisions primarily on personally acquired 'soft' information rather than digitally acquired 'hard' information. However, my evidences also suggest that despite FinTech is rapidly increasing in the banking industry, the local banking market is still important, as the benefits due to personal bank-firm relationships cannot be completely substituted by FinTech

The fourth chapter expands the context of analysis, focusing on a cross-country European environment. It first generalizes the findings of prior contributions that carried out single-country studies, confirming that local banking development

positively affects firm financial policies also in the wider European setting. Then, it studies the relationship between the local and the national banking sector and the resulting influence on SMEs financial policies. Results interestingly reveal that the development of the banking markets at the national level shapes the influence of local banks on SME financial policies. In particular, when the national banking institutions are more developed, the relevance of the local banking sector on SMEs financial decisions is lower. Therefore, the development of national banking markets moderates the effect of local ones.

The four chapters of the thesis have the same common thread, which is the role of banking development to corporate growth processes, and hope to offer new insight in the banking development literature. The results obtained shed light on practical implications that policy-makers, managers and practitioners could take into account.

A first implication of my thesis is that the local banking context still matters, despite the internalization of financial markets and despite the advent of FinTech. The bank-SME relationship favors the access to bank credit allowing SMEs and research spin-offs to get business opportunities and grow, favoring in turn the growth of the entire economy. With this regard, the contacts between the firm and its lenders should be stimulated, especially in those local contexts where the local banking markets are poorly developed. This can happen through dedicated funds, financial incentives or online lending, which is a growing alternative sources of financing that reduce information asymmetries through new financial technologies. This is particularly important for SME during crisis periods, such as the current COVID-19 crisis when firms experienced the sales downfall (Fahlenbrach et al. 2020). Governments should reduce financial constraints by developing new banking instruments that support the investments of SMEs and research spin-offs, increasing the availability of debt financing especially in those underdeveloped provincial banking contexts. The thesis also suggests Government to improve primarily the national banking markets, which drive the entire banking sector, in order to increase SMEs credit availability.

Moreover, the key implication of my thesis is that firms are still in need of human bankers and close ties with their bank branches, even in a context where the national financial sector and FinTech drive the change. The decision-making role of a loan officer can be difficulty be substitute by FinTech, especially for informational opaque

SMEs. However, the importance of bank branches is changing, for which in the near future banking institutions should reorganize their business model where digitalization and personal relationships coexist.

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Chapter 1

Local Banking Development and Cash Holdings in Italian SMEs

Abstract

In this chapter, I investigate the effect of local banking development on cash holdings of Italian small and medium sized enterprises (SMEs). Consistent with the hypothesis that local banking development reduces the need to hold precautionary cash because it facilitates access to bank debt, I find that local banking development measured by the density of bank branches in Italian provinces has a negative effect on corporate cash holdings. This effect is driven by SMEs with bank debt. Furthermore, the negative effect of local banking development on cash holdings only exists for younger and smaller SMEs, which are more likely to benefit from increased local banking development. My work highlights that local banking development is an important driver of policies on holding cash by SMEs and is particularly relevant during crisis periods, such as the recent COVID-19 crisis.

Keywords: cash holdings, local banking development, SMEs, asymmetric information, financial constraints, bank debt.

1.1 Introduction

Corporate finance decisions are significantly affected by the financial system in which a firm operates (Rajan and Zingales 1995; Demirguc-Kunt and Maksimovic 1996; La Porta et al. 1997; Fan et al. 2012). A well-developed financial system facilitates access to external finance (Demirguc-Kunt and Maksimovic 1998; Guiso et al. 2004). An important component of financial development is banking development, that differs across countries but also at the local level *within* countries. Differences in local banking development especially affect corporate finance decisions of small and medium-sized enterprises (SMEs) (Pollard 2003; Alessandrini et al. 2009; La Rocca et al. 2010; Deloof and La Rocca 2015; Deloof et al. 2019). As the proximity between local banks and their customers facilitates screening and monitoring of informationally opaque firms, the local presence of banks can alleviate asymmetric information problems, which reduce the access of SMEs to external finance, (Berger and Udell 1998; Petersen and Rajan 2002; Beck et al. 2005). Local banks can provide loans to SMEs based on soft information acquired by the local banker via personal contacts with the SME owners and managers. Consistent with this argument, it has been found that local banking development improves SME access to debt (La Rocca et al. 2010; Cowling et al., 2020a), it reduces their financing constraints (Alessandrini et al. 2009) and bankruptcy risk (Arcuri and Levratto 2020), and it facilitates growth (Guiso et al. 2004; Kendall 2012) and the provision of trade credit (Deloof and La Rocca 2015).

In this chapter, I investigate the effect of local banking development on the cash holdings of Italian SMEs. While cash holdings tend to be a substantial part of SME assets (Bigelli and Sánchez-Vidal 2012) and have worldwide been increasing over time (Chen et al. 2017), I currently know very little about the relation between local banking development and SME cash holdings.[4] Cash reserves are likely to be especially important for informationally opaque SMEs facing difficulties in obtaining external financing (Almeida et al. 2004; Berger and Udell 1998). SMEs that have restricted access to external finance due to asymmetric information problems will prefer internally available funds to finance their investments. Only when internal funds

[4] One study investigating the relation between local bank markets and cash holdings is Han et al. (2017), who find that small US firms hold less cash if they are located in a highly concentrated local banking market concentration.

are inadequate do they seek debt as a second best option (Myers and Majluf, 1984). A well-developed local banking system increases the availability of external finance and consequently reduces the need of SMEs to hold cash as a precautionary buffer against adverse shocks. If SMEs operate in a poorly developed banking environment with limited access to debt, they have to keep more precautionary cash (Almeida et al. 2004; Khurana et al. 2006; Han and Qiu 2007; Denis and Sibilkov 2010). However, this will reduce the availability of funds for growth related investments and hence may reduce their growth. Therefore, it is important to understand how the banking environment in which SMEs operate affect their cash holdings.

The importance of cash holdings for SMEs has recently been highlighted by the COVID-19 crisis, which was a severe negative shock for many SMEs. Cowling et al. (2020b) estimate that the majority of British SMEs run the risk of a liquidity crisis due to insufficient cash holdings at the beginning of the COVID-19 crisis, while Acharya and Steffen (2020) and Li et al. (2020) have found that this crisis led to a "dash for cash", whereby firms have tried to draw down bank credit lines and raise their cash levels.

My investigation focuses on Italy, which, for several reasons, provides a very interesting environment to investigate the relation between local banking development and cash holdings. SMEs play a crucial role in the Italian economy, representing 99.7% of all businesses in Italy. They are particularly important in the southern regions where there are very few large firms.[5] Italian firms are also characterized by high cash holdings, which reduce their vulnerability to negative shocks such as the COVID-19 crisis.[6] Furthermore, there is a wide variation in banking development across Italian provinces and interestingly, in contrast to many the other European countries, the number of bank branches interestingly increased during the period examined[7]. The richness of Italian data allows us to assess the causal effect of local banking

[5] Source: Italian National Institute of Statistics (ISTAT), report available at http://dati-censimentipermanenti.istat.it/

[6] Bank of Italy, Financial Stability Report No. 1/2020, report available at https://www.bancaditalia.it/pubblicazioni/rapporto-stabilita/2020-1/en_FSR_1-2020.pdf?language_id=1

[7] As evidenced by a report from the international company KPMG entitled "Sportelli bancari e nuovi modelli distributivi. Contesto di riferimento e scenari evolutivi, 2013" available at https://assets.kpmg/content/dam/kpmg/it/pdf/2017/02/KPMGSportellibancarinuovimodellidistributivi.pdf

development on SME cash holdings by including exogenous determinants of the local banking development as instruments in two stage least squares regressions, following the methodological approach of other studies (Guiso et al. 2004; Herrera and Minetti 2007; Deloof and La Rocca 2015; Deloof et al. 2019).

My results show that local banking development, measured by bank branch density in Italian provinces, negatively affects the cash holdings of SMEs. I find this negative effect only for those SMEs that do use bank debt, which confirms that it is the access to bank debt that drives the effect of local banking development on cash holdings. Moreover, I observe that the negative effect of local banking development only exists for younger and smaller SMEs, which are more informational opaque and, therefore, are more likely to benefit from an increase in the number of nearby bank branches. Interestingly, I also find that the effect of bank branch density is driven by *national* banks and not by local banks, highlighting the importance of a local presence of branches of national banks for SME access to bank debt. Bank branch density reduces cash holdings of SMEs both during and after the Global Financial Crisis, but the effect is more pronounced during the crisis, suggesting that local banking development matters especially during crisis periods.

A key implication of my results is that SMEs operating in a poorly developed local banking setting have more difficulties in obtaining bank funding and, as a result, have to keep a buffer of cash to finance both their current activities and growth opportunities. The need to keep a large cash reserve is likely to limit their growth, since this cash could otherwise be used to fund growth projects. In this respect, my research has important implications for governments, suggesting that removing the barriers that cause SMEs to save cash for precautionary motives instead of investing in growth opportunities will stimulate growth. This is especially important during crisis periods such as the current COVID-19 crisis, when SMEs need external financial resources to survive collapsing revenues and to recover from the crisis (Lim et al. 2020). My results suggest that local banking institutions may play a key role in this respect.

The remainder of the chapter is structured as follows. I describe the Italian context in Section 2. Section 3 presents the main literature and the research hypotheses. Section

4 discusses the data, variables, and descriptive statistics. Section 5 contains the results. Section 6 provides some conclusions and implications.

1.2 The Italian context

The large persistent differences in banking development across Italian provinces make Italy a very suitable environment to investigate the effects of local banking development. Italy is a bank-based economy like many other European countries, such as France, Germany and Spain. The government introduced a banking regulation in 1936 that put Italian banks under state control and limited competition and the establishment of new bank branches. In 1990, a new regulation permitted the consolidation and the sale of state-held banks. As evidenced by the Bank of Italy, this led to a rapid growth in the number of bank branches in Italy from 16,600 in 1990 to 30,740 in 2014.

Bank debt is the single most important source of financing for SMEs in Italy, where banking markets play a very minor role in corporate finance (Beck et al. 2008; Agostino et al. 2011). The most important Italian banks operate nationwide. In 2018, 77% of the bank branches in Italy were branches from national banks.[8] "Banche di Credito Cooperativo" (BCC), which are cooperative banks, also play an important role, with 22% of the bank branches in Italy in 2018. BCCs are owned by cooperative members who typically also are bank customers. By definition, they are local banks, given their legal obligation to operate in limited territorial areas (Alessandrini et al. 2009; Stefani et al. 2016). This characteristic makes them geographically close to SMEs. By operating in the local community and being owned by members of the local community, they may find it easier to acquire soft information via personal relationships with entrepreneurs, which is not available to national banks that operate at a distance (Angelini et al. 1998; Howorth and Moro 2006; Bolton et al. 2016). The lending decisions of national banks will be more based on hard information such as credit scoring and less on the personal relationship between the banker and the firm

[8] Foreign banks had only 1% of Italian bank branches. Source: Banca d'Italia report available at https://www.bancaditalia.it/pubblicazioni/banche-istfin/2019-banche-istfin/statistiche_STATER_29032019.pdf.

(Howorth and Moro 2006). However, these banks operate on a much larger scale than cooperative banks and use modern lending technologies to screen and monitor their customers, which makes them more cost efficient than the smaller and less diversified cooperative banks. This may allow the national banks to provide cheaper loans to informationally opaque SMEs than cooperative banks (Black and Strahan 2002).

With respect to corporate governance, Italian firms are in general actively managed by their owners, and there is not a marked separation between ownership and control (Bianco and Casavola 1999; Giacomelli and Trento 2005). Most Italian firms are SMEs that are family owned and operate in mature industries. These features make Italian SMEs prone to financial constraints. Therefore, local banking development is likely to be particularly important to the growth of Italian SMEs, even in an integrated financial market. This growth is particularly important for provinces in the south of Italy, which are economically underdeveloped. Considering all these aspects, I can conclude that the Italian setting is a worthwhile case study to assess the potential effects of local banking development on SME cash holding.

1.3 Literature Review and Hypotheses development

Market frictions make external debt expensive (Faulkender and Wang 2006), and cash holdings provide financial flexibility to firms that have difficulty accessing financial markets (Kim et al. 1998, Gamba and Triantis 2008, Chen et al. 2017). An important cause of the market frictions that reduce financial flexibility is the presence of asymmetric information that hampers access to external financing, especially for younger and smaller firms (Berger et al. 2001). These financial difficulties create a demand for cash, as cash resources allow the firm to invest in value-increasing projects when access to external financing is restricted (Almeida et al. 2004; Denis and Sibilkov 2010). Banks can mitigate information problems with relationship lending that allows to acquire information through repeated contacts with a firm and its managers (Petersen and Rajan 1994). The presence of a loan officer who has personal contacts with the firm, its owners, and its managers facilitates the acquisition of soft information on those firms that have or want to have a relation with banks (Petersen

and Rajan 1997). Thus, the proximity between SMEs and bank branches reduces their information asymmetries that thereby facilitates the provision of bank credit.

Together with asymmetric information, adverse selection and moral hazard could cause financial constraints and reduce financial flexibility. Adverse selection refers to the problem for lenders in selecting good credit risks ex ante when they have no information about the quality of the borrower (Stiglitz and Weiss 1981). Moral hazard denotes the inability of the lender to enforce credit contracts ex post because of costly monitoring and incomplete contracting. A close relationship between the lender and the borrower mitigates both problems that reduces the need to hold precautionary cash. Furthermore, if there are more bank branches in a local community, increased competition between the banks might increase the availability of loans for SMEs (Black and Strahan 2002).

In a system where bank branches and SMEs are neighbours, firms are less likely to miss valuable business opportunities when they do not have a cash buffer because they can secure credit from the bank. Consistent with this argument, La Rocca et al. (2010) find that an increase in banking development at the local level increases access to debt financing for Italian SMEs. Consequently, as better access to debt reduces the need to hold precautionary cash, I propose the following hypothesis:

H. 1 – Local banking development has a negative effect on SME cash holdings.

It could be argued that cash holdings are basically a by-product of financing and investment decisions, and for that reason the level of cash holdings does not really say anything about the financing policy of the firm. However, informationally opaque SMEs often have restricted access to external finance, leading to a pecking order in their finance with a preference for internally available funds (Lopez-Gracia and Sogorb-Mira 2008). Consistent with this argument, Michaely and Roberts (2012) find that the dividend payments of privately held firms in the UK are determined by the internal need for cash (which includes the need for cash holdings) and not vice versa as is the case for listed firms.

In recent years, new fintech financing methods have emerged as a source of financing that complements or replaces traditional bank lending (Gomber et al. 2017; Short et al. 2017). Crowdfunding especially is an important new instrument to fund a business and is particularly useful to SMEs (Maiolini and Naggi 2011, Mollick 2014). Fintech reduces the distance between the firm and the lender and the relative asymmetric information they might have (Cappa et al. 2020). Consequently, fintech influences the relationship between local banking development and cash holdings. However, despite the recent proliferation of online lending as an alternative financing channel, bank debt remains the most used source of external funding by far in Italy[9]. The fact that a SME has bank debt means that the firm not only has a need for debt, but also that it has access to debt. SMEs with bank debt have already passed the due diligence and screening investigation of a bank. Moreover, they will be monitored by the lending bank during the loan relationship. Therefore, the SMEs that borrow from a bank will benefit from a more developed local banking system in the area in which they operate, as it provides close interaction with the lender.

SMEs without bank debt could instead be of two types. The first type, zero-leverage constrained SMEs, suffer financial constraints and consequently, save cash reserves to carry on their activities so that they can face any contingencies (Bessler et al. 2013). The second type, zero-leverage unconstrained SMEs, willingly do not use bank debt, although they can obtain bank financing. Thus, the development of the banking system is less likely to matter to zero-leverage SMEs (constrained or unconstrained), as they cannot or deliberately do not want to use bank debt. Consequently, local banking development is unlikely to affect their cash holdings.

Differently, local banking development facilitates access to bank debt for those SMEs that are in need or want to use external funding, which reduces the need to hold cash. Indeed, where the banking system is well-developed, indebted SMEs can more easily get additional debt and, consequently, they have less need to keep a buffer of cash on their balance sheets. Therefore, I propose the following hypothesis:

[9] Source: CRIF special report on Italian PMI capital structure available at https://www.crifratings.com/media/1421/special-report_-pmi_struttura-finanziaria-delle-pmi-italiane_ita_15122016_final.pdf

H.2 - The SMEs that use bank debt drive the negative effect of local banking development on cash holdings.

Younger and smaller firms are more likely to face moral hazard and asymmetric information, which make them financially, constrained (Berger et al. 2001). Furthermore, young firms will typically have a high need for funding, as they have high growth opportunities and limited internally generated cash flows. But they often have insufficient collateral to offer and lack a proven track record (Dittmar and Duchin 2011). As a result, SMEs that are younger and smaller are more likely to benefit from local banking development in terms of easier access to external financing. These firms will benefit the most from the closeness of bank branches and loan officers, who can assess their qualities as borrowers. Therefore, I propose the following hypothesis:

H.3 -The negative effect of local banking development on cash holdings is stronger for younger and smaller SMEs who are more informationally opaque.

1.4 Data, Model, variables and descriptive statistics

1.4.1 Data

My analysis is based on a sample of nonfinancial Italian SMEs that employ fewer than 250 persons, which is the European Commission's definition of an SME. The period I study is from 2008 to 2014. I use unbalanced panel data that I collected from the Amadeus database of the Bureau van Dijk. These data contain the balance sheets of private and public companies across Europe. To avoid selection bias, firms that became inactive during the sample period remained in the sample for the years that they were active. I eliminated financial industries (NACE[10] codes 64, 65, 66, 68, 77) as well as firms with NACE codes 84 to 90 (public administration; education; human

[10] NACE is the European statistical classification of economic activities. NACE groups organizations according to their business activities. Statistics produced based on NACE are comparable at the European level.

health and social work; and creative, arts, and entertainment), NACE code 94 (membership organisations) and NACE codes 97–98 (activities of households as employers, undifferentiated goods- and services-producing by households for own use).

Restrictions on the data were imposed as follows: First, I selected all firms with accounting information over the sample period. Then, I left out economically meaningless observations with respect to accounting information. To limit the potential influence of outliers, I winsorized all the firm-specific variables (except Age) at the 1st and 99th percentiles (Debt, Tangibility, ROA and Size) or at the 5th and 95th percentiles (Working Capital and Firm Growth) before performing my regressions. Moreover, I removed any observations with errors (non-positive values for total book assets, negative number of years the firm has been operating) and zero sales. Thus, I obtain a sample of 2,032,148 firm-year observations over the 2008–2014 period. I also use data from other sources. Data on the density of bank branches and competition in the bank market per province come from the Bank of Italy. Data on gross domestic product (GDP), local crime and population per province are collected from the Italian National Institute of Statistics (ISTAT).

1.4.2 Model and variables

To test my hypotheses, I first use the traditional ordinary least squares (OLS) technique. Since omitted factors could influence the effect of local banking development on cash holdings, I also estimate regressions using the two stage least squares (2SLS) technique with instrumental variables (IV). I use the same instrumental variables as in Guiso et al. (2004), Deloof and La Rocca (2015), and Deloof et al. (2019), who all measure local banking structures in 1936. These structures were largely determined by factors unrelated to local economic development. As mentioned earlier, the new legislation introduced in 1936 strongly restricted the development of the Italian banking sector. As a result, the local (provincial) differences that existed then persist to today. The instruments consist of the amount of bank branches in 1936, the number of banks, the number of popular bank branches, and the 1936 branch

density in the SME province. Popular banks are larger cooperative banks that since 1936 have evolved into large banks operating on a national basis.

The dependent variable of my model is Cash Holdings, measured as the ratio between cash and cash equivalents scaled by total assets (see Almeida et. al. 2004; Ozkan and Ozkan 2004). Following the approach of Benfratello et al. (2008), Alessandrini et al. (2009), La Rocca et al. (2010), Deloof and La Rocca (2015), and others, the local banking development measure Branch Density is the number of bank branches (national, cooperative, and foreign) per 1,000 inhabitants in the province. I similarly calculate the variables National Branch Density, BCC Branch Density, and Foreign Branch Density, respectively, as the number of national, BCC, and foreign branches per 1,000 inhabitants in the province.

I include a number of firm-specific characteristics that may influence SME cash holdings in my regressions (see Belghitar and Khan 2013). Tangibility is the ratio of tangible fixed assets to total assets. Tangible assets may increase firm debt capacity as they are used as collateral, and thereby can reduce the need for cash holdings (Lei et al. 2018). Size is measured as the logarithm of total assets. Larger firms typically have a lower cash ratio due to economics of scale in holding cash. Age is the natural logarithm of one plus the number of years since the firm creation. Older firms tend to hold more cash (Drobetz et al. 2015). The variable Bank Debt is the ratio of long-term bank debt plus short-term bank debt to total assets. According to the pecking order theory, firms with a surplus of internal funds will have more cash and less need for debt. Working capital, which can be a substitute for cash holdings, is measured by the ratio of working capital to total assets (see Ferreira and Vilela 2004). Firm growth is measured as sales in year (t) minus sales in year (t-1). Growing SMEs generally require more financial resources (Binks and Ennew 1997). ROA is the ratio of earnings before interest and taxes (EBIT) to total assets and measures profitability. Firms that are more profitable are likely to generate and hold more cash.

I also control for provincial characteristics that may affect corporate cash holdings. To take into account differences in economic development between provinces, I include GDP Growth, which is measured as the growth in real GDP at the provincial level from year (t-1) to year (t). South is a dummy that that equals one if the firm is located in the southern part of Italy and zero otherwise. This variable is important, as previous

studies on banking development in Italy (Guiso et al. 2004 in particular) have shown relevant differences between the northern and the southern parts of the country. Industry and year fixed effects using dummies are also included in the econometric model. Finally, in line with the literature on local banking development (see Deloof and La Rocca 2015; Deloof et al. 2019), I include in our model a measure of local crime (per-capita fraud), which is related to local banking development (Bonaccorsi di Patti, 2009), and a measure of the concentration of the provincial bank market (HHI). Per-capita fraud is the number of crimes at the provincial level scaled by the population. The HHI is measured as the sum of squared market shares of banks operating in the province and is based on the number of bank branches in 2009. This variable controls for the bank structure at the local level to measure the extent of the competition in relation to the branch concentration in the local banking systems.

*** Table 1 about here ***

1.4.3 Descriptive statistics

Table 1 shows the descriptive statistics for the variables. It presents the mean, median, standard deviation, maximum value, and minimum value at the 25th and 75th percentiles for all variables. While the median firm has a cash ratio of 4.4%, the mean cash holding is 11% with a standard deviation of 15.7%, indicating that there is substantial variation in cash holdings across the firms in my sample. There is also substantial variation with respect to branch density. The values for the other variables are in line with the literature on the cash holdings of SMEs. Table 1 also shows that the variability in the control variables is in line with the literature.

*** Table 2 about here ***

Table 2 (which is shown at the end of the chapter) presents the correlation matrix of my variables. All correlations are statistically significant at the 0.05 level or lower. The negative correlation between cash holdings and bank branches is statistically significant at the 0.01 level. I tested possible multicollinearity among the independent

variables by using the variance inflation factors (VIFs) that estimate how much the variance in my regression coefficients is inflated due to multicollinearity. The maximum VIF in my model is 2.19 (mean of 1.38) which is far below the generally accepted cutoff of 10 (or, more prudently, 5) for regression models. Therefore, no bias was detected in the significance of my results.

*** Table 3 about here ***

1.5 Empirical results

1.5.1 Local banking development and SME cash holdings

Table 3 shows the general effect of local banking development on corporate cash holdings. The *p*-values are based on heteroscedastic robust standard errors. For the 2SLS regressions, the F-test statistic of the first stage indicates that the instruments are always jointly significant when estimating the local banking development. The *p*-value of the instruments is statistically significant. Moreover, the lack of statistical significance of the Hansen-J statistic further confirms the validity of the instruments.

Local banking development as measured by Branch Density negatively affects SME cash holdings, which confirms Hypothesis 1. The finding is statistically significant when using both OLS in column 1 and 2SLS in column 2. With respect to the economic significance, the coefficient for Branch Density in column 2 means that a one standard deviation increase in Branch Density (0.185) reduces cash holdings by 2.86% as compared to the sample mean (0.110). This result is also confirmed when I use the natural logarithm of cash holdings as the dependent variable (column 3) and when I control for bank concentration through the Herfindahl–Hirschman Index (HHI) (column 4). In Column 5, I take into account the presence at the provincial level of national, BCC, and foreign bank branches by separately including National Branch Density, BCC Branch Density, and Foreign Branch Density. Interestingly, I find that the increase in branches of national banks reduces cash holdings, while there is no significant effect for BCC branches and foreign branches. This suggests that it is an

increasing local presence of national banks that reduces the need for SMEs to hold cash.

With regard to the firm-specific control variables, the results are generally as expected. Italian SMEs hold more cash if they have fewer tangible assets, bank debt, and working capital; if they are smaller, younger, and more profitable; and if they have a higher growth rate.

As a further test, I studied the effect of local banking development on cash holdings conditioned by a set of firm characteristics (tangibility, size, age, net working capital, firm growth, and ROA). This test allows us to understand whether firm-specific factors moderate the effect of local banking development on cash holdings. The marginal effect of Branch Density conditioned by firm-specific variables is shown in Figures A.1–A.6 in appendix. The results confirm that firm characteristics moderate the effect of local banking development on the decision to hold cash, which supports the findings of Lyandres and Palazzo (2016) who claim that firm-specific characteristics and banking development jointly shape corporate cash policy. Specifically, I find that the effect of branch density on cash holdings is smaller for SMEs that find it easier to attract bank financing: older, larger, and more profitable SMEs and SMEs with more tangible assets and more net working capital. The negative effect of branch density even disappears for larger SMEs, confirming my findings in Table 5. Differently, firm growth does not seem to matter much for the effect of branch density on cash holdings.

I also investigated whether the effect of local banking development on the cash holdings of Italian SMEs was different during the Global Financial Crisis (period 2008-2010) and after the Global Financial Crisis (period 2011-2014). The results, which are reported in Tables A.2-A.3 in the appendix, show that there is a negative effect of branch density on cash holdings in both periods. However, the effect is stronger in the crisis period 2008-2010 than in the post-crisis period 2011-2014, indicating that a lack of access to debt due to an underdeveloped local banking sector increases the need of SMEs to hold cash more during a crisis period.

*** Table 4 about here ***

1.5.2 The role of bank debt

Table 4 reports the results concerning Hypothesis 2. The findings show that local banking development negatively affects SME decisions to hold cash for firms that use bank debt (Column 1), but not for those that do not use bank debt (Column 2). This result is confirmed when for the full sample I estimate a regression that includes Dummy Bank Debt that equals one if an SME has bank debt and zero otherwise, and the interaction between this dummy and the Branch Density variable (Column 3). In this regression Branch Density ceases to be significant while the interaction term is statistically significant, which again indicates that local banking development only affects cash holdings for firms with bank debt. This difference can be explained by SMEs using bank debt as a substitute for cash.

1.5.3 The cash holdings of informationally opaque SMEs

Tables 5 and 6 report the results concerning the relationship between local banking development and cash holdings for subsamples of firms that depends on how sensitive they are to asymmetric information problems. In particular, I use the firm size (Bigelli and Sánchez-Vidal 2012; Kim et al.1998) and age (Dittmar and Duchin 2011; Drobetz et al. 2015) as proxies for asymmetric information. I expect that the effect of local banking development on cash holdings is more pronounced for smaller and younger firms. In Table 5 I consider subsamples of small SMEs and large SMEs that are based on the first quartile and the last quartile of the Size variable. I find a significantly negative effect of local banking development on cash holdings for small SMEs (column 1) but not for large SMEs (column 2). This finding is confirmed when I estimate a regression for the full sample with Dummy Small that equals one for large SMEs (i.e., those firms above the median value for the variable Size) and zero otherwise, and the interaction between this dummy variable and Branch Density. Not surprisingly, the economic effect is much stronger for small SMEs than for the full sample. A one standard deviation increase in branch density (0.185) reduces cash holdings by 8.15%, compared to the mean for the small SMEs subsample (0.143).

*** Table 5 about here ***

Table 5 also shows some interesting differences with respect to the effect of the control variables on the policies for cash holdings. Small SMEs typically find it harder to convince bank lenders of their credit worthiness than large SMEs. Tangible assets that provide collateral (Lyandres and Palazzo 2016) reduce the need to hold cash more for small SMEs. Firm size, which is associated with a better reputation, and working capital, which is a substitute of cash holdings (Ferreira and Vilela 2004; Demiroglu and James 2011) and helps SMEs to get external financing (Diamond 1989; Binks and Ennew 1997), also matter more for small SMEs than for large SMEs. I also find that profitability as measured by ROA has a smaller effect on the cash holdings of small SMEs. A possible explanation is that small SMEs need a larger portion of profits to fund their investments and as a result are less able to keep these profits as cash reserves.

*** Table 6 about here ***

Table 6 presents the results for the subsamples based on Age: (1) new firms of one year old, (2) SMEs younger than five years (25 percentile), (3) SMEs older than 11 years (50 percentile), (4) SMEs older than 21 years (75 percentile), and (5) SMEs older than 31 years (90 percentile. The results from Table 6 indicate that the effect of local banking development on cash holdings depends on the age of SMEs. I only find a negative effect from Branch Density for the younger SMEs in my sample (up to five years old), which is consistent with the argument that older SMEs generally have better access to external financing than younger firms (Berger and Udell 1998) and are less dependent on the proximity of bank branches for their funding.

Table 6 further shows that the negative effect of bank debt on cash holdings increases with age that indicates SMEs substitute cash liquidity with bank loans more over time. As in Table 5, I find that the effects of tangibility, size, and working capital are more pronounced for firms that have more severe asymmetric information problems, that is younger firms (smaller firms in Table 5). I also find that profitability affects cash holdings more for firms with less asymmetric information problems, that is, older firms. All these results confirm my findings for the subsample for size. Overall, the

results confirm that if SMEs operate in an institutional context for which banking development is poor, they try to save a stock of cash, especially when it is harder for them to obtain external financing. Small and young SMEs benefit the most from the development of banking intermediaries.

1.5.4 Placebo test

My sample has a very high number of observations, which could affect the statistical significance of the findings (Athey and Imbens 2017). To make sure that this number does not lead to false statistically significant results I applied a placebo test, in which 200 times I randomly assigned a branch density to each firm of I sample, and each time re-estimated my regression with the variable Branch Density re-shuffled. I expect that in this setting Branch Density does not significantly influence SME cash holdings. When I run the placebo test, I find that the estimated coefficient of Branch Density is not statistically significant at the 10% level in 93.5% of the cases.[11] Hence, the results of placebo tests confirm the robustness of my findings, demonstrating that the relationship between local banking development and cash holdings is not influenced by chance.

1.6 Conclusion and implications

In this study, I demonstrate that local banking development reduces the need for SMEs to hold cash. In Italian provinces with a higher bank branch density, the nearby presence of bank branches facilitates the access of SMEs to bank credit and, consequently, allows them to keep lower levels of cash. Vice versa, a poor degree of local banking development leads SMEs to keep a higher buffer of cash against any potential contingencies. I find that this effect is significant only for smaller and younger SMEs, which face more severe asymmetric information problems than larger and older SMEs. I also find that it is additional branches of national banks rather than

[11] The coefficient of Branch Density is significant at the 10% level in 3% of the cases, at the 5% level in 1,5% of the cases, and at the 1% level in the 2% of the cases. The results of the 200 Placebo test regressions are available upon request.

branches of local banks that reduce the need for holding cash. I do not find any effect of bank branch density on cash holdings for firms without bank debt, which confirms my hypothesis that bank branch density negatively affects cash holdings because it increases access to bank debt. A placebo test confirms that the statistical significance of my findings is not driven by the fact that I have a very large sample. Finally, my results indicate that the negative effect of branch density on cash holdings is less pronounced for firms that have a lower need for bank debt or have easier access to bank debt, which is consistent with my main hypothesis.

My findings provide new insights into the role of cash holdings of SMEs. While there is an extensive literature on cash policies of large listed firms, research on cash holdings of SMEs remains scarce[12], notwithstanding the fact that SMEs differ from large firms in fundamental ways. While the cash policies of listed firms are often driven by agency problems between managers and shareholders (Gao et al. 2013), SMEs are generally privately-held, with their owners managing the firm. Furthermore, SMEs are more likely to be constrained in accessing external funding than large firms, leading to a higher need for cash to finance their growth (Brav, 2009). If a dearth of bank branches in the neighborhood reduces access of SMEs to bank debt, which is their primary source of external finance, this will restrict their growth.

My analysis has some limitations. First, while the economic importance of SMEs and the historically determined variation in local banking development across provinces makes Italy a particularly interesting setting to study the effect of local banking development on SME cash holdings, it is not clear whether my results also apply to other countries and to other institutional settings. Therefore, it would be interesting to explore the relation between local banking development and SMEs cash holdings in a multi-country setting that covers different institutional environments. Second, I measure the effect of access to bank debt for SMEs *indirectly*, via local bank branch density. To confirm my findings, it would be interesting to investigate how access to bank debt measured at the individual firm level affects the cash holdings of SMEs.

My research has implications for policy makers by showing that the local banking context is still relevant, despite the internalization of financial markets. The growth of

[12] Exceptions are García-Teruel and Martínez-Solano (2008), Bigelli and Sánchez-Vidal (2012), Martínez-Sola et al. (2018) and Cowling et al. (2020a).

SMEs, which affects the growth of the entire economy, strongly depends on their ability to seize investment opportunities. The presence of local bank branches increases the availability of funding for SMEs and should be encouraged, as banks play a crucial role in entrepreneurial growth (Fraser et al., 2015). I demonstrate that a higher local bank branch density reduces the need for SMEs to hold precautionary cash, thereby increasing the amount of cash available to finance new investments. Policymakers could help informationally opaque SMEs in areas where the local banking system is poorly developed by promoting new financial instruments such as online lending, which could bring alternative sources of financing and help SMEs in their negotiations with banks. The fact that the effect of local banking development I find is driven by *national* bank branches rather than by local banks demonstrates the importance of the presence of national banks at the local level.

Finally, it is interesting that local banking institutions seem to be particularly important for SME cash holdings during a crisis period. This has implications for the recent COVID-19 crisis that had a strong negative effect on the revenues of many firms (Fahlenbrach et al., 2020). My findings indicate that young and small SMEs will be more likely to survive the COVID-19 crisis and finance their growth if they are located in a more developed local banking area, which reduces the need to hold precautionary cash.

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Table 1 - Descriptive Statistics for the sample.

	Mean	Median	Sd	Min	25° Percentile	75° Percentile	Max
Cash Holdings	0.110	0.044	0.157	0.000	0.008	0.147	1.000
Branch Density	0.562	0.533	0.185	0.176	0.443	0.7113	1.074
National Br Density	0.483	0.478	0.143	0.144	0.392	0.599	0.840
BCC Br Density	0.073	0.043	0.080	0.000	0.023	0.104	0.653
Foreign Br Density	0.006	0.002	0.009	0.000	0.000	0.008	0.037
HHI	0.100	0.092	0.042	0.000	0.075	0.114	0.520
Tangibility	0.173	0.084	0.208	0.000	0.024	0.249	0.888
Size	6.431	6.431	1.547	2.131	5.423	7.463	10.002
Age	2.281	2.398	0.981	0.000	1.609	3.045	5.017
Bank Debt	0.143	0.032	0.191	0.000	0.000	0.256	0.759
Working Capital	0.304	0.273	0.231	0.000	0.103	0.472	0.771
ROA	0.043	0.039	0.136	-0.590	0.007	0.085	0.507
Firm Growth	0.393	-0.003	1.502	-1.000	-0.212	0.248	5.766
GDP Growth	0.001	0.000	0.049	-0.952	-0.016	0.016	12.345
Per-capita Fraud	0.188	0.182	0.050	0.069	0.153	0.211	0.335
South	0.206	0.000	0.404	0.000	0.000	0.000	1.000

Table 2 – Correlation matrix

		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
(1)	Cash Holdings	1.00										
(2)	Branch Density	-0.06	1.00									
(3)	National Branch Density	-0.06	0.92	1.00								
(4)	BCC Branch Density	-0.05	0.67	0.32	1.00							
(5)	Foreign Branch Density	0.01	0.04	0.08	-0.18	1.00						
(6)	HHI	-0.00	-0.24	-0.13	-0.28	-0.33	1.00					
(7)	Tangibility	-0.20	0.06	0.04	0.07	-0.07	0.05	1.00				
(8)	Size	-0.31	0.16	0.15	0.09	0.04	-0.04	0.21	1.00			
(9)	Age	-0.16	0.12	0.12	0.06	0.04	-0.02	0.19	0.51	1.00		
(10)	Debt	-0.29	0.13	0.12	0.09	-0.01	-0.01	0.15	0.26	0.14	1.00	
(11)	Working Capital	-0.26	-0.00	0.00	-0.01	0.01	-0.01	-0.35	0.09	0.09	0.16	1.00
(12)	ROA	0.18	0.04	0.04	0.01	0.02	-0.02	-0.08	0.00	-0.05	-0.10	0.01
(13)	Firm Growth	-0.03	0.03	0.05	-0.00	0.02	-0.02	-0.02	0.13	-0.06	0.00	-0.01
(14)	GDP Growth	-0.00^{+}	0.04	0.05	-0.01	0.01	0.00^{+}	0.01	0.01	-0.01	0.01	-0.00
(15)	Per-capita Fraud	0.04	-0.34	-0.28	-0.34	0.39	-0.08	-0.09	-0.03	-0.02	-0.06	0.01
(16)	South	0.04	-0.70	-0.73	-0.28	-0.31	0.12	-0.01	-0.11	-0.11	-0.08	0.00

Notes: Industry dummies are not reported. Correlations greater than 0.03 or lower than -0.03 are statistically significant at the 0.05 level or lower.

Table 3 - Main model: results concerning local banking development and Cash Holdings

Estimation method:	(1) OLS	(2) 2SLS	(3) 2SLS	(4) 2SLS	(5) 2SLS
Dependent variable:	Cash Holdings	Cash Holdings	Ln(Cash Holdings)	Cash Holdings	Cash Holdings
Branch Density	-0.008**	-0.017**	-0.511***	-0.019***	
	(0.004)	(0.007)	(0.135)	(0.007)	
HHI				-0.011	
				(0.022)	
National Branch Density					-0.034***
					(0.011)
BCC Branch Density					0.001
					(0.008)
Foreign Branch Density					-0.019
					(0.061)
Tangibility	-0.182***	-0.182***	-1.854***	-0.182***	-0.183***
	(0.002)	(0.002)	(0.041)	(0.002)	(0.002)
Size	-0.022***	-0.022***	0.626***	-0.022***	-0.022***
	(0.002)	(0.002)	(0.014)	(0.002)	(0.002)
Age	0.009***	0.009***	0.089***	0.009***	0.009***
	(0.001)	(0.001)	(0.005)	(0.001)	(0.001)
Bank Debt	-0.110***	-0.109***	-1.938***	-0.109***	-0.109***
	(0.007)	(0.007)	(0.112)	(0.007)	(0.007)
Working Capital	-0.190***	-0.190***	-1.751***	-0.190***	-0.190***
	(0.002)	(0.002)	(0.051)	(0.002)	(0.002)
ROA	0.177***	0.177***	1.725***	0.177***	0.178***
	(0.003)	(0.003)	(0.057)	(0.003)	(0.003)
Firm Growth	-0.002***	-0.002***	0.007***	-0.002***	-0.002***
	(0.000)	(0.000)	(0.002)	(0.000)	(0.000)
GDP Growth	0.130	0.123	1.997**	0.122	0.119
	(0.092)	(0.086)	(0.810)	(0.085)	(0.082)
Per-capita Fraud	-0.002	-0.009	-0.179	-0.012	-0.008
	(0.008)	(0.011)	(0.240)	(0.011)	(0.013)
South	0.002	-0.001	-0.046	-0.001	-0.005
	(0.002)	(0.003)	(0.043)	(0.003)	(0.003)
Industry Fixed Effects	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes
Adj. R2	0.264	0.278	0.328	0.263	0.264
Observations	2,032,148	2,032,148	2,032,148	2,032,148	2,032,148

Notes: The 2SLS model uses local banking structures in 1936 as instrumental variables. The *p*-values are in parentheses: $^{*}p<0.10$, $^{**}p<0.05$, $^{***}p<0.01$

Table 4 - Model with and without bank debt.

Estimation method:	(1) 2SLS With Bank Debt	(2) 2SLS Without Bank Debt	(3) 2SLS Model with interaction
Dependent variable:	Cash Holdings	Cash Holdings	Cash Holdings
Branch Density	-0.017**	-0.012	-0.011
	(0.008)	(0.011)	(0.007)
Branch Density* Dummy Bank			-0.052***
			(0.007)
Dummy Bank Debt			-0.049***
			(0.002)
Tangibility	-0.123***	-0.253***	-0.190***
	(0.004)	(0.003)	(0.003)
Size	-0.011***	-0.030***	-0.022***
	(0.001)	(0.002)	(0.002)
Age	0.006***	0.015***	0.009***
	(0.001)	(0.001)	(0.001)
Bank Debt	-0.060***		-0.038***
	(0.005)		(0.006)
Working Capital	-0.147***	-0.211***	-0.193***
	(0.004)	(0.004)	(0.003)
ROA	0.161***	0.191***	0.167***
	(0.003)	(0.004)	(0.004)
Firm Growth	-0.001***	-0.003***	-0.003***
	(0.000)	(0.000)	(0.000)
GDP Growth	-0.014	-0.047	-0.050
	(0.012)	(0.035)	(0.035)
Per-capita Fraud	-0.025**	0.022	-0.007
	(0.014)	(0.022)	(0.010)
South	-0.001	-0.002	-0.002
	(0.003)	(0.003)	(0.002)
Industry Fixed Effects	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes
Adj. R2	0.196	0.225	0.284
Observations	1,182,140	850,008	2,032,148

Notes: The 2SLS model uses local banking structures in 1936 as instrumental variables. The *p*-values in parentheses: *$p<0.10$, **$p<0.05$, ***$p<0.01$

Table 5 - Small and large SMEs

Estimation method:	(1) 2SLS Small SMEs	(2) 2SLS Large SME	(3) 2SLS Model with interaction
Dependent variable:	Cash Holdings	Cash Holdings	Cash Holdings
Branch Density	-0.063***	0.004	0.011
	(0.017)	(0.013)	(0.009)
Dummy Small			0.017***
			(0.004)
Dummy Small*Branch			-0.062***
			(0.007)
Bank Debt	-0.098***	-0.098***	-0.109***
	(0.010)	(0.005)	(0.007)
Tangibility	-0.333***	-0.138***	-0.183***
	(0.008)	(0.005)	(0.002)
Size	-0.078***	-0.004***	-0.026***
	(0.002)	(0.001)	(0.003)
Age	0.009***	0.012***	0.009***
	(0.001)	(0.001)	(0.000)
Working Capital	-0.311***	-0.148***	-0.189***
	(0.007)	(0.006)	(0.002)
ROA	0.147***	0.278***	0.180***
	(0.002)	(0.006)	(0.002)
Firm Growth	-0.003***	-0.001***	-0.002***
	(0.000)	(0.000)	(0.000)
GDP Growth	-0.003	-0.003*	-0.028
	(0.005)	(0.003)	(0.027)
Per-capita Fraud	0.001	0.015	-0.006
	(0.024)	(0.019)	(0.011)
South	0.004	-0.009*	-0.003
	(0.007)	(0.005)	(0.003)
Industry Fixed Effects	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes
Adj. R2	0.314	0.251	0.267
Observations	509,960	507,862	2,032,148

Notes: The 2SLS model uses local banking structures in 1936 as instrumental variables. The *p*-values in parentheses: $^{*}p< 0.10$, $^{**}p< 0.05$, $^{***}p< 0.01$

Table 6 - Model for different age of SMEs.

Estimation method:	(1) 2SLS 1 year old	(2) 2SLS 5 years old (25 percentile)	(3) 2SLS 11 years old (50 percentile)	(4) 2SLS 21 years old (75 percentile)	(5) 2SLS 31 years old (90 percentile)
Dependent variable:	Cash Holdings	Cash Holdings	Cash Holdings	Cash Holdings	Cash Holdings
Branch Density	-0.085***	-0.047***	-0.004	-0.000	-0.003
	(0.025)	(0.014)	(0.007)	(0.009)	(0.010)
Bank Debt	-0.035***	-0.058***	-0.123***	-0.134***	-0.138***
	(0.005)	(0.005)	(0.007)	(0.006)	(0.006)
Tangibility	-0.400***	-0.250***	-0.190***	-0.202***	-0.214***
	(0.012)	(0.009)	(0.003)	(0.003)	(0.005)
Size	-0.064***	-0.042***	-0.015***	-0.012***	-0.010***
	(0.003)	(0.002)	(0.001)	(0.001)	(0.001)
Age		-0.022***	0.020***	0.019***	0.013***
		(0.001)	(0.001)	(0.001)	(0.003)
Working Capital	-0.390***	-0.250***	-0.206***	-0.220***	-0.230***
	(0.011)	(0.006)	(0.003)	(0.005)	(0.007)
ROA	0.101***	0.132***	0.193***	0.195***	0.191***
	(0.006)	(0.004)	(0.004)	(0.005)	(0.007)
Firm Growth	0.001***	-0.003***	-0.001***	-0.001***	-0.001***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
GDP Growth	-0.010	-0.002	0.002	0.002	0.003
	(0.014)	(0.005)	(0.003)	(0.003)	(0.004)
Per-capita Fraud	0.035	-0.009	-0.014	-0.000	0.005
	(0.036)	(0.018)	(0.012)	(0.013)	(0.017)
South	-0.004	0.000	-0.001	-0.006**	-0.010***
	(0.010)	(0.006)	(0.002)	(0.003)	(0.003)
Industry Fixed	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes
Adj. R2	0.382	0.319	0.275	0.295	0.313
Observations	101,399	538,525	1,055,975	532,266	221,308

Notes: The 2SLS model uses local banking structures in 1936 as instrumental variables. The *p*-values in parentheses: *$p<0.10$, **$p<0.05$, ***$p<0.01$

APPENDIX

Table A.1 – Variables descriptions.

Dependent variable	***Calculation***	***Role***
Cash Holdings	Cash & cash equivalents / total assets	Dependent variable
Explanatory variables		
Branch Density (Local Banking Development)	(Total Bank Branches at provincial level × 1000) / Population at provincial level	Independent variable
HHI (Hirschman and Herfindahl Index)	Sum of squared Market Shares of Banks operating in the province (number of Bank Branches in 2009)	Controls for the bank structure at local level
Tangibility	Tangible Assets / Total Assets	Controls for the typology of assets
Size	ln(total assets)	Controls for corporate size
Age	ln(1 + Age)	Controls for SME age characteristics
Bank Debt	(Long-Term Bank Debt + Short-Term Bank Debt) / Total Assets	Controls for SME level of indebtedness
Working Capital	(Working Capital) / Total Assets	Controls for a substitute of cash holdings
Firm Growth	$(\text{Sales}_{t} - \text{Sales}_{t-1}) / \text{Sales}_{t-1}$	Controls for SME growth
ROA	EBIT / Total Assets	Controls for SME profitability
GDP Growth	$[(\text{real GDP at provincial level})_{t} - (\text{real GDP at provincial level})_{t-1}] / (\text{real GDP at provincial level})_{t-1}$	Controls for GDP growth at provincial level
Per-capita Fraud	Mean number of Fraud Crimes at provincial level scaled by population	Controls for the level of crime at provincial level
South	Dummy equal to one for firms based in the southern part of Italy	Controls for north-south differences.

Table A.2 - Main model: results concerning local banking development and Cash Holdings during the Global Financial Crisis (period 2008-2010).

Estimation method:	(1) OLS	(2) 2SLS	(3) 2SLS	(4) 2SLS	(5) 2SLS
Dependent variable:	Cash Holdings	Cash Holdings	Ln (Cash Holdings)	Cash Holdings	Cash Holdings
Branch Density	-0.014***	-0.028***	-0.803***	-0.031***	
	(0.005)	(0.010)	(0.178)	(0.010)	
HHI				-0.017	
				(0.013)	
National Branch Density					-0.052***
					(0.013)
BCC Branch Density					-0.022
					(0.030)
Foreign Branch Density					-0.065
					(0.072)
Tangibility	-0.190***	-0.190***	-1.911***	-0.190***	-0.191***
	(0.003)	(0.003)	(0.050)	(0.003)	(0.003)
Size	-0.025***	-0.025***	0.629***	-0.025***	-0.025***
	(0.002)	(0.002)	(0.013)	(0.002)	(0.002)
Age	0.005***	0.005***	0.082***	0.005***	0.005***
	(0.001)	(0.001)	(0.006)	(0.001)	(0.001)
Bank Debt	-0.104***	-0.103***	-1.801***	-0.103***	-0.103***
	(0.007)	(0.007)	(0.106)	(0.007)	(0.007)
Working Capital	-0.191***	-0.191***	-1.738***	-0.191***	-0.191***
	(0.005)	(0.005)	(0.072)	(0.005)	(0.005)
ROA	0.148***	0.148***	1.791***	0.148***	0.148***
	(0.005)	(0.005)	(0.066)	(0.005)	(0.005)
Firm Growth	-0.002***	-0.002***	0.009***	-0.002***	-0.002***
	(0.000)	(0.000)	(0.002)	(0.000)	(0.000)
GDP Growth	0.002	-0.000	0.052	-0.000	-0.000
	(0.004)	(0.004)	(0.066)	(0.005)	(0.005)
Per-capita Fraud	-0.002	-0.012	-0.197	-0.015	-0.010
	(0.010)	(0.012)	(0.276)	(0.013)	(0.019)
South	0.002	-0.002	-0.138**	-0.003	-0.008*
	(0.003)	(0.004)	(0.059)	(0.004)	(0.004)
Constant	0.388***	0.399***	0.367**	0.403***	0.411***
	(0.017)	(0.018)	(0.167)	(0.019)	(0.018)
Industry Fixed Effects	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes
Adj. R2	0.278	0.278	0.321	0.278	0.277
Observations	733,950	733,950	733,950	733,950	733,950

Notes: The 2SLS model uses local banking structures in 1936 as instrumental variables. The p-values are in parentheses: *p< 0.10, **p< 0.05, ***p< 0.01

Table A.3 - Main model: results concerning local banking development and Cash Holdings after Global Financial Crisis (period 2011-2014).

Estimation method:	(1) OLS	(2) 2SLS	(3) 2SLS	(4) 2SLS	(5) 2SLS
Dependent variable:	Cash Holdings	Cash Holdings	Ln(Cash Holdings)	Cash Holdings	Cash Holdings
Branch Density	-0.004	-0.011*	-0.345***	-0.013**	
	(0.004)	(0.006)	(0.122)	(0.006)	
HHI				-0.013	
				(0.011)	
National Branch Density					-0.026**
					(0.010)
BCC Branch Density					-0.004
					(0.018)
Foreign Branch Density					-0.019
					(0.076)
Tangibility	-0.186***	-0.186***	-1.814***	-0.186***	-0.186***
	(0.002)	(0.002)	(0.036)	(0.002)	(0.002)
Size	-0.023***	-0.023***	0.625***	-0.023***	-0.023***
	(0.002)	(0.002)	(0.014)	(0.002)	(0.002)
Age	0.009***	0.009***	0.093***	0.009***	0.009***
	(0.001)	(0.001)	(0.004)	(0.001)	(0.001)
Bank Debt	-0.112***	-0.112***	-2.028***	-0.112***	-0.112***
	(0.007)	(0.007)	(0.117)	(0.007)	(0.007)
Working Capital	-0.200***	-0.200***	-1.754***	-0.200***	-0.200***
	(0.002)	(0.002)	(0.041)	(0.002)	(0.002)
ROA	0.172***	0.172***	1.695***	0.172***	0.172***
	(0.003)	(0.003)	(0.052)	(0.003)	(0.003)
Firm Growth	-0.004***	-0.004***	0.003	-0.004***	-0.004***
	(0.000)	(0.000)	(0.002)	(0.000)	(0.000)
GDP Growth	0.005	0.005	0.005	0.006	0.005
	(0.004)	(0.004)	(0.063)	(0.005)	(0.004)
Per-capita Fraud	-0.001	-0.009	-0.122	-0.011	-0.011
	(0.008)	(0.011)	(0.210)	(0.012)	(0.013)
South	0.004*	0.001	-0.002	0.001	-0.001
	(0.002)	(0.002)	(0.038)	(0.002)	(0.003)
Constant	0.356***	0.361***	0.056	0.364***	0.368***
	(0.014)	(0.014)	(0.115)	(0.014)	(0.013)
Industry Fixed Effects	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes
Adj. R2	0.268	0.268	0.333	0.268	0.268
Observations	1,298,198	1,298,198	1,298,198	1,298,198	1,298,198

Notes: The 2SLS model uses local banking structures in 1936 as instrumental variables. The p-values are in parentheses: *p< 0.10, **p< 0.05, ***p< 0.01

Figure A.1 - Marginal effect of Branch Density conditioned by Tangibility

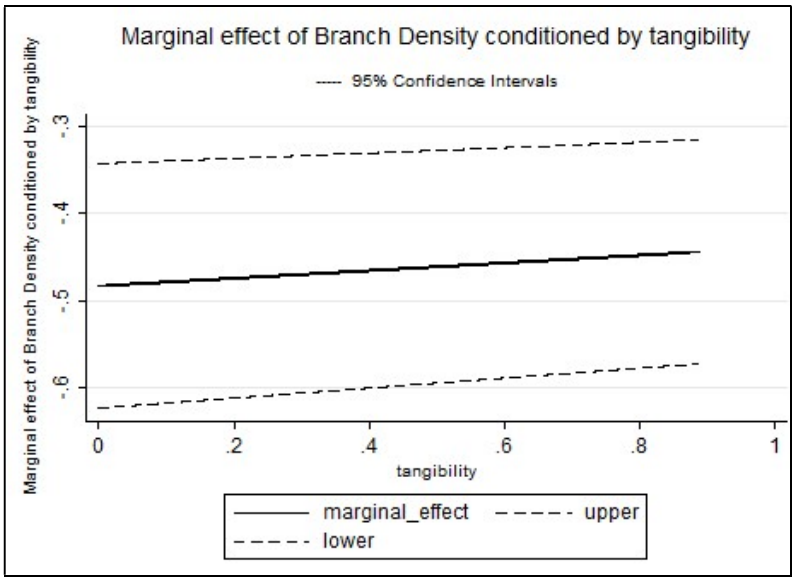


Figure A.2 - Marginal effect of Branch Density conditioned by Age

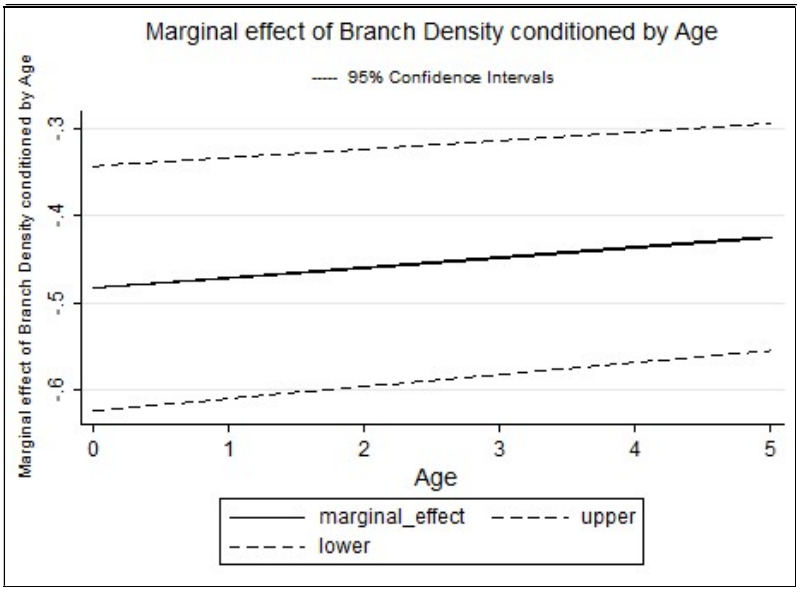


Figure A.3 - Marginal effect of Branch Density conditioned by Net Working Capital

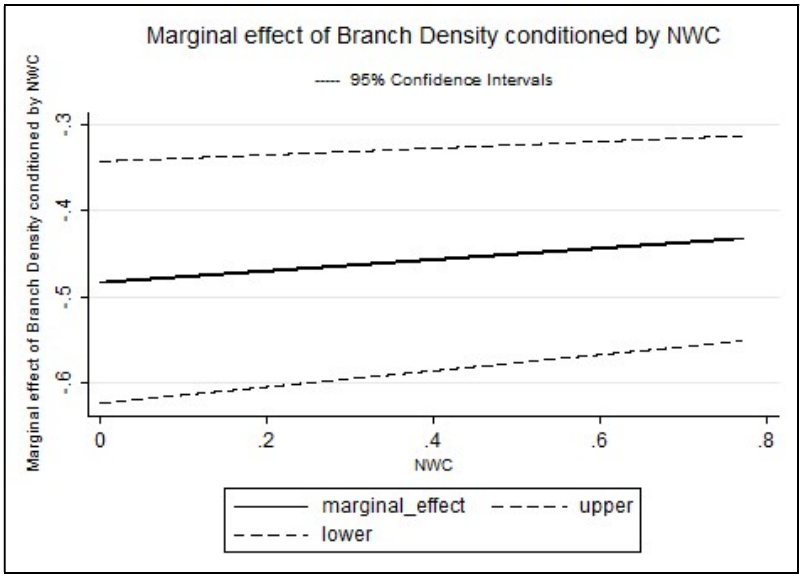


Figure A.4 - Marginal effect of Branch Density conditioned by ROA

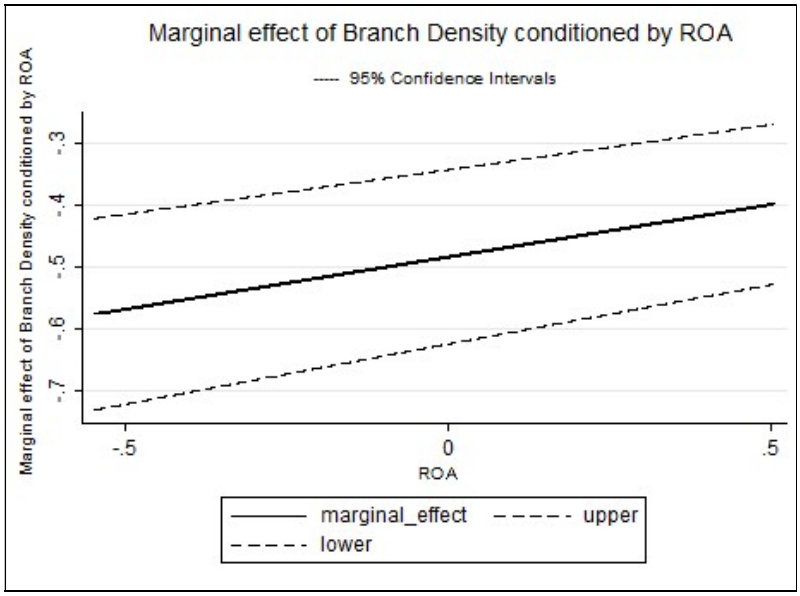


Figure A.5 - Marginal effect of Branch Density conditioned by Size

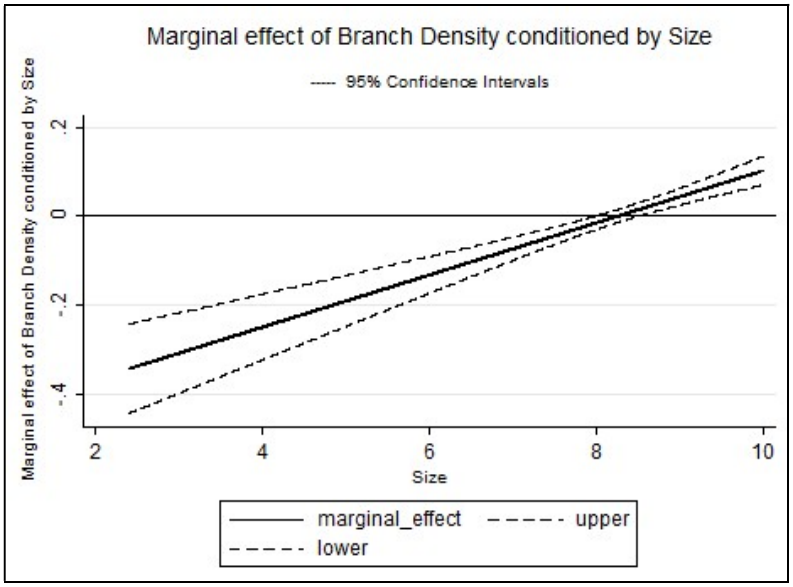
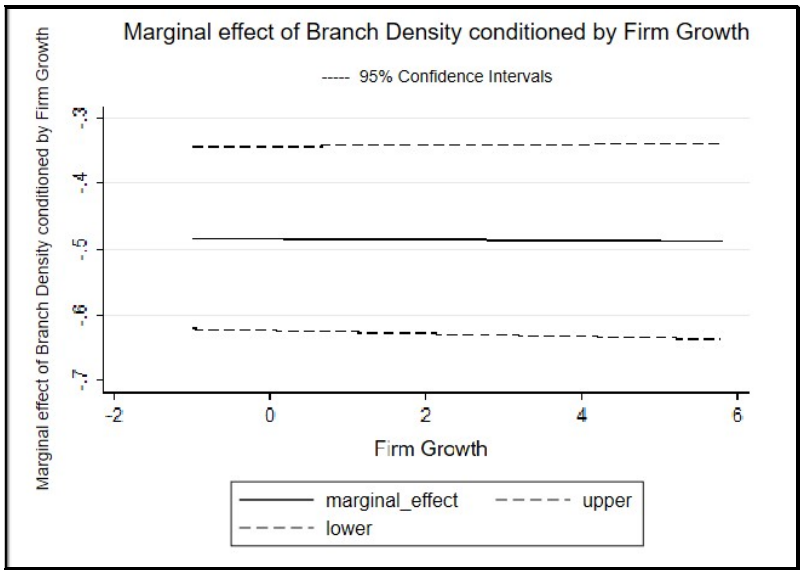


Figure A.6 - Marginal effect of Branch Density conditioned by Firm Growth



Chapter 2

Banking Relationship and Research Spin-offs' life cycle: the Italian experience

Abstract

Research spin-offs are special firms created within Universities or research institutes who require significant financial resources to transfer their innovative technologies to the market. This work studies an important driver of RSO success, investigating whether and how the value of research spin-offs is conditioned by the local banking environment in which they operate. Empirical results highlight that the local development of the banking sector does not affect RSO performance at the time of incubation, when the main source of funding comes from public contributions. Differently, there is a significant, positive and growing influence of local banking institutions when the RSO enters the market and becomes independent from public resources. The findings suggest to Governments and banking institutions to develop new financial instruments to support RSOs, especially during the early stages of their life-cycle. At the same time, RSOs should consider bank debt as complementary source of funding that allows them not to miss the vital growth opportunities emerging during the incubation phase.

Key words: banks, local banking development, research spin-off, university, innovation, economic growth.

2.1 Introduction

Universities and research institutes are protagonists of economic growth. Coherently with the third mission the research system transfers knowledge and technology from the academic environment to the market (Clarysse at al., 2005; Chiesa and Piccaluga, 2000) and a large part of products and processes existing on the market could not have been developed without the support of the academic research (Mansfield, 1995). Universities and research institutes enact different exploitation strategies and academic/research spin-offs (ROSs) are considered a special tool to promote the technology transfer. Shane (2004) defines an academic spin-off as "those high-tech companies whose core business is based on the commercial valorization of results of a scientific and technological research". Thus, RSOs create knowledge and generate innovation, through new product development (Bellini et al., 2002; Atasu et al., 2009). Moreover, they create new industries and also new employment for both academics and graduates (Rizzo, 2015; Shane, 2004).

Miranda et al., 2018 propose a review of the literature on spin-offs, by identifying internal and external drivers that boost RSO success. Among the external divers that influence RSO value, the institutional context, the financial incentives, the support and the advice structures at the local/university level play a very important role. In this framework, the relevance of the banking institutions is a new interesting driver to investigate, as the access to external financial resources is important to RSO growth (Ortín et al., 2007; Patzelt and Shepherd, 2009; Trinugroho et al., 2021). The effectiveness of investors is fundamental for RSOs, to move from the technology development phase to commercialization (Keuschnigg and Nielsen, 2004; Wright et al., 2006). This is because during the development phase that precedes commercialization (incubation period), RSOs need capitals to finance their technological activities, prototyping and engineering their innovations (Fernández-Alles et al., 2015; Munari et al., 2016; Ayoub et al., 2017). These capitals can be found through internal or external resources. However, RSOs in the early stages of their life-cycle are small and young firms, for which they are not able to internally generate enough cash and have difficult access to financial markets (Berger et al., 2001). As a result, RSOs could face asymmetric information problems in debt contract

negotiations, because financers have scarce information about their operating activities. However, RSOs, differently from other young and small firms, can rely on non-refundable resources that the Government makes them available to conduct scientific research in the technology development phase. These external resources reduce RSO financial needs at their incubation stage. Though, when the RSOs are no longer dependent from public contributions, i.e. at the time of their entrance in the product market, the banking institutions could become relevant. Indeed, well-developed banking systems could better meet the credit need of RSOs looking for financial resources to face the market competition.

In this context, this work empirically investigates whether and how the local banking development affects the performance of research spin-offs during the incubation period and after the market entry of the product. More in detail, I want to understand whether and how during the RSOs life cycle a well-developed banking system shapes corporate performance. The present contribution aims to bridge an important gap in the RSO literature, exploring the role of an important institutional factor, that is the banking system, as crucial driver to boost spin-offs' performance. Also, the use of RSOs to test the effects of local banking development is new in the literature. Most prior papers in this field uses firm data or aggregate economic data. The fact that a RSO can rely on the support of Universities and research institutes during their incubation period provides an interesting setup to test the influence of the local banking institutions.

The study is based on Italy that is a perfect background of analysis, as the banking development significantly differs across local contexts (Italian provinces). Moreover, the detailed information available for this country allows to investigate the influence of the banking systems on RSO performance by including exogenous determinants of the local banking development, following the methodological approach of noteworthy contributions (Guiso et al., 2004; Deloof and La Rocca, 2015; Deloof et al., 2019).

The chapter tries to answer the following research question: does local banking development affects the performance of RSOs at the time of incubation and after the incubation period? The findings suggest that in the incubation phase, when RSOs mainly rely on public contributions, local banking institutions do not matter to corporate performance. *Vice versa*, when RSOs enter the market, they are more in need

of external funds, for which the banking sector interestingly becomes strongly relevant, affecting their performance. A key implication of the findings is that policy makers should stimulate technology-based entrepreneurship from universities via not only public funds, but also improving the banking systems through specific banking solutions dedicated to RSOs. Moreover, banks should not ignore RSOs during the engineering phases and, at the same time, RSOs should more looking for bank funding.

The remainder of the chapter is structured as follow. Paragraph 2 develops the literature review and the research hypotheses. Paragraph 3 explains the choice to use Italy as context of analysis. Paragraph 4 discusses the data, model, variables, and descriptive statistics. Paragraph 5 contains the results, while Paragraph 6 concludes and provides practical implications.

2.2 Literature Review and research hypotheses

Several noteworthy studies suggest that a more developed banking system is significantly related to a better access to external finance (Demirgüç-Kunt and Maksimovic, 2002; Beck et al., 2004; Cetorelli and Strahan, 2006) and a lower probability for firms of being financially constrained or go bankruptcy (Arcuri and Levratto, 2020; Musso and Schiavo, 2008; Love, 2003). With regard to new firms, Aghion et al. (2007) suggest that financial development promotes the entry and post-entry growth, while Deloof et al. (2016) highlight that local banking development increases the debt financing. Therefore, the characteristics of the financial environment in which firms operate is at the core of their potential success. This is particularly relevant for young and small & medium sized enterprises (SMEs), which are those firms with the greatest financial constraints, as evidenced by Guiso et al. (2004) and Beck et al. (2005). In this context, the role of banks is crucial. Indeed, asymmetric information problems could be limited through the banking relationship, including fintech instruments (Cappa et al., 2020; Maiolini et al., 2019). If a bank and a SME have a long-term relationship, the bank is able to capture a greater amount of information about the quality of the company and provides better financial solutions

that fit the corporate needs (Castelli et al., 2006). Particular kind of young and small firms are the RSOs, whose activities are based on innovation, which is expensive and requires huge financial resources. In general, start-ups and early-stage firms look for certification of their quality with regard to other stakeholders by submitting themselves to bank monitoring (Diamond, 1989 and 1991). The lack of any track record and reputation in the product market can be overcome by the firm submissions to bank control. Even the interaction with potential customers, suppliers and employees can favor the access to bank credit. Joseph Schumpeter (1912) stated: "*well-functioning banks spur technological innovation by identifying and funding those entrepreneurs with the best chances of successfully implementing innovative products and production processes*". He argued that the services provided by banks are essential for the technological innovation and the economic development. In the same vein, Sharma (2007) observes that in countries with greater financial development, companies are more likely to innovate, while Ayyagari et al (2007) highlight that innovation is higher for firms that have access to external resources. Even in the context of the present analysis based on RSO, banks can play a very important role. The literature on RSOs is rich of contributes that investigate on the factor that boost the performance of RSOs. Clarysse et al. (2011) underline that the newness of technology and the ability to protect innovations through patents affect the performance of RSOs. Kriegesmann (2000) observe the importance of six factors affecting the performance of RSOs: 1) autonomy of the founder; 2) need of leadership of the founder; 3) assumption of personal responsibility from the founder; 4) business risk taking of the founder; 5) horizontal structure of the company; 6) formal contacts between universities and RSOs. Bleibst and Lautenschlager (2004) and Gassmann et al. (2003) identify the career orientation of the RSO's founder as the key factor that impacts on the performance of a RSO. Smilor and Matthews (2004) show that the support provided by the University to a spin-off may increase its success, observing some factors that are crucial to obtain good performance: 1) financial involvement of University; 2) competent staff within the technology transfer offices; 3) transparency and clarity of policy support; 4) access to entrepreneurial skills. Among the factors that influence RSO performance, some studies have highlighted the role played by the financial

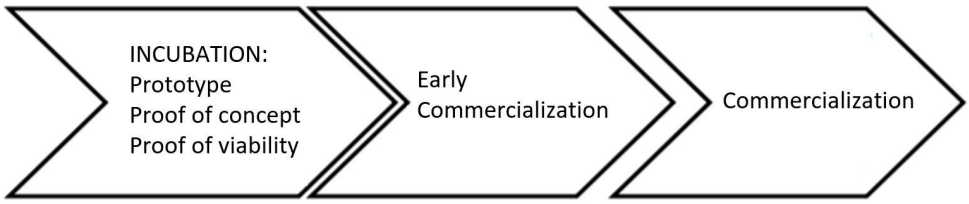
system[13] (Fini et al., 2011; Iacobucci and Micozzi, 2015, Stefanelli et al., 2020). Fini et al. (2011), for example, find a positive relationship between the level of regional development (calculated as the probability that a household is shut off from the credit market for each region), and the number of new RSOs incorporated. However, the creation of a new RSO is not guarantee of success per se. Indeed, as Agarwal and Bayus (2002) point out, *"it takes on average 14 years before a technology patented at a research institute reaches 2% of its peak sales at market maturity*". Typically research RSOs face a long incubation period before the commercialization of the product. Although the timing of the different phases of a RSO's life cycle varies a lot across the different industries, there is, in general, a considerable timeframe between the first phase of the life cycle and the sales take-off. RSO's life cycle can thus be summed up as follows:

- An incubation period composed of three subphases according to Rasmussen (2011): a research phase during which the researchers involved in the project are engaged in turning their ideas into a prototype. A second phase characterized by a proof of concept stage with intense activity of fundraising, that can be labelled the opportunity framing phase (Vohora et al., 2004), or alternatively the gestation (Vanaelst et al., 2006). A proof of viability phase characterized by the development of the prototype in order to understand how it can have an effective commercial use (Vanaelst et al., 2006);
- An early commercialization phase, when the RSO enters the market to commercialise its technologies and faces for the first time the market competition;
- A commercialization phase, when the RSO has efficiently commercialized technologies, products or services, starting the maturity phase (Clarysse and Moray, 2004; Vanaelst et al., 2006).

The above three incubation sub-phases and the following early commercialization and commercialization phases can be synthetized thought the following Figure 1.

[13] Financial system is intended as the set of instruments, institutions and mechanisms that ensure the transfer of financial resources from surplus to deficit subjects (financial resources allocation function).

Figure 1 - Process of development of academic spin-offs



Source: my elaboration.

During the incubation phase, RSOs are usually located into physical spaces (also known as "incubators") that Universities or research institutes make them available, or they are located in Universities' departments or research centers' institutes. RSOs at this time try to exploit the most all the assets (laboratories, staff, etcetera) necessary to develop their concept. In these phases sales are mainly equal to zero (or very low), as RSOs are far away from realizing substantial earnings through the sale of products or services, while non-operational earnings represent the largest part of total revenues. Non-operational earnings represent the non-refundable resources available to foster RSO operations. This is a crucial aspect to consider when studying the role of the local banking development on the performance of RSOs. Indeed, the presence of public contributions is fundamental to generally establish when a RSO lives its engineering phases. It results scientifically more rigorous to appraise the different phases of a RSO's life cycle according to the extent to which a RSO moves from a stage with non-operating revenues higher than sales (incubation period), to a maturity stage where sales are higher than non-operating revenues (semi-dependence state) or non-operating revenues are equal to zero (i.e. when the RSO is financially autonomous from public funds)[14]. This is a sort of indirect way to appreciate the time the RSO takes off on the market, dealing with customers and selling products. Indeed, the difference between sales and other revenues allows to account for dealing with customers or dealing with

14 the real independence of RSOs from Universities and research institutes is not a matter of time. Indeed, it is not possible to calculate an average incubation period for all the RSOs of the sample, as it depends on the kind of industry in which the firm operates. For instance, a RSO that operates in the molecular biology field takes more time to commercialize its products compared to a RSO that develops smartphone applications, since the latter in general does not need a particular patent protection (a process that lasts several months to be completed), and addresses the market faster.

start-cup competitions or similar other source of revenues not linked to the entrance in the product market.

At the time a RSO has sales equal to zero (or very low) and its survival is totally and uniquely dependent from non-operational earnings, it means that this company is *de facto* a "proto-company" still *in nuce*, but not really operative on the markets. During this incubation period the financial resources available from banks play a subordinate role, for which the relevance of the external banking context is negligible. Hence, the degree of development of the banking system should not affect the performance of RSOs when they work under the wing of Universities or research institutes, in a sort of a protected environment where financial resources mainly come from public contributions. Consequently, I expect that during the engineering period the development of the local banking system does not influence the performance of RSOs:

***Hypothesis 1*: *Local banking development is not relevant to RSO performance during the incubation period*.**

The real end of the incubation period can be assessed once the prototype is put in place, when RSOs enter the product market, are no longer fully dependent from public funds and sales grow until they outnumber non-operational revenues. At this time physical spaces of incubator are no more available and the RSOs start to be autonomous in their operational activities. At this point, RSOs need to face the market competitions (for technologies or for products). Therefore, they need huge short and long-term financial resources (to reinforce their research infrastructures, and their laboratories, to invests in intellectual property or to implement manufacturing plans), no longer available from public institutions. Here comes into play the bank-RSO relationship, whose relevance has recently been underlined by Stefanelli et al. (2020), and the degree of the banking development could become strongly relevant After the incubation period in fact, RSOs meet the market for the first time (early commercialization phase and commercialization phase). Kochenkova et al. (2016) argue that in a I ll-functioning financial system new firms seeking financial resources can find an environment plenty of opportunities. Hemer et al. (2005) point out that bank loans are almost irrelevant for spin offs' founding, but they are relevant in later phases of the firm development. A

possible explanation of this dependence from banks lies in the fact that RSOs are unable to initially generate substantial returns and internal cash resources, as the Pecking Order Theory (POT) points out (Myers and Majluf, 1984). According to the POT, firms prefer to use internally available funds to finance their investments. However, firms with constrained access to external finance due to asymmetric information problems will benefit most from the development of the banking system. Indeed, well-developed local banking institutions are better able to appreciate the quality of firm's projects by screening and monitoring activities, allowing to increase the availability of external finance used to catch new growth opportunities. Specifically, the proximity between local banks and RSOs could facilitate the economic relationship and the access to credit. The local presence of banks could also alleviate asymmetric information problems and reduce the cost of external finance, allowing firms to have better access to bank debt (Berger and Udell, 1998; Petersen and Rajan, 2002; Beck et al., 2005). Local banks can exploit soft information acquired by the banker via personal contacts with the RSO and can provide the adequate financial support. Therefore, at this time banking institutions can finally influence RSO performance. Therefore, in presence of a higher degree of local banking development, the access to external sources of financing should be easier for RSOs. The consequent hypothesis is:

Hypothesis 2: *Local banking development has a positive effect on the performance of RSOs after their incubation period.*

2.3 Research spin-offs in the Italian context

Italy is an ideal setting to study the influence of local banking systems on RSO performance, because in this country there are significant differences in the banking development across provinces. Italy is a bank-based economy like many other European countries (e.g. France, Germany and Spain) and bank debt is the single most important source of financing for Italian companies (Beck et al., 2008; Agostino et al.,

2011). From 1936, the competition and the establishment of new bank branches was limited by the existing legislation and Italian banks were under the state control. In 1990, a new regulation allowed the consolidation and the sale of state-held banks. Consequently, the number of bank branches rapidly increased (from 16,600 in 1990 to 30,740 in 2014). The most important Italian banks operate nationwide. In 2019, 76% of the bank branches in Italy originated from national banks. Cooperative banks ("Banche di Credito Cooperativo", BCC) also play an important role (18% of the bank branches in Italy in 2019). BCCs are owned by cooperative members who typically are bank customers. By definition they are local banks, given their legal obligation to operate in limited territorial areas (Alessandrini et al., 2009; Stefani et al., 2016).

With respect to the Italian spin-offs, the Government introduced the Legislative Decree 297/1999 through which the Italian Universities established RSOs regulations. Moreover, the Law 262/2004 introduced the creation of Technology Transfer Offices (TTOs) and Industrial Liaison Offices (ILOs). More in general, the attention to RSOs significantly increased in Italy during the last years (Muscio et al., 2016). This resulted in an increase of contributions studying the Italian RSOs phenomenon. Bellini et al. (1999) observe an increase in productivity, in terms of public research results, thanks to the activity RSOs. Chiesa and Piccaluga (2000) studied the transfer of public research to market, considering 48 Italian spin-offs. Their work shows that Italian RSOs represent an important driver to exploit and disseminate the results of public research. Salvador (2011) shows a prevalence of micro-RSOs in Italy, mainly located in the northern regions. Moreover, Fini et al. (2017) study the role of the Italian institutions for the creation of RSOs.

Notwithstanding the growing literature in this field, in Italy the RSOs phenomenon has not been investigated in depth (Stefanelli et al., 2020; Salvador, 2011). In this context, this study provides an important contribution to this line of literature, also providing important indications to study the role of banks for RSOs in the wider European framework.

2.4 Data, Model, variables and descriptive statistics

2.4.1 Data

The sample is based on an unbalanced panel dataset of 1,947 research spin-offs from the Italian Universities (public and private) and public research institutes listed in the Ministry of Education[15]. I selected only active RSOs during the sample period, which is from 2006 to 2014. Financial and ownership information come from the Amadeus database of the Bureau van Dijk, which has the most extensive database of financial and business information of private and public companies across Europe. Then, I left out economically meaningless observations with respect to accounting information. To limit the potential influence of outliers, I also winsorized all the continuous firm-specific variables at the 1st and 99th percentiles. Data on the density of bank branches per province come from the Bank of Italy. Data on gross domestic product (GDP), local crime and population per province are collected from the Italian National Institute of Statistics (ISTAT).

2.4.2 Model and variables

I investigate the hypotheses first using the two stage least squares (2SLS) technique with instrumental variables (IV), since omitted factors and simultaneous causality relationship could influence the effect of local banking development on RSO performance. I use the same instrumental variables as in Guiso et al. (2004), Deloof and La Rocca (2015), and others who measure local banking structures in 1936. These structures were largely determined by factors unrelated to local economic development. As above-mentioned, the new legislation introduced in 1936 strongly restricted the development of the Italian banking sector. As a result, the local (provincial) differences that existed then persist to today. The instruments consist of the amount of bank branches in 1936 (IV1), the number of banks (IV2), the number of popular bank[16] branches (IV3), and the 1936 branch density (IV4) in the province. The resulting 2SLS model is the following.

15 When information about research spin-offs was not directly available on the website, I contacted (by email or telephone) each University to obtain a list of RSOs.

16 Popular banks are larger cooperative banks that since 1936 have evolved into large banks operating on a national basis.

First stage:

$Local\ Banking\ Development = \alpha_0 + \alpha_1$ IV1 $+\alpha_2$ IV2$+\alpha_3$ IV3 $+ \alpha_4$ IV4

Second stage:

$RSO\ performance\ = \beta_0 + \beta_1$

Instrumented $Local\ Banking\ Development + \beta_h\ X + \varepsilon$

As robustness tests, I used the ordinary least squares based on clustered standard errors (OLS cluster) and the multilevel modelling approach. The dependent variable employed is ROA that is the ratio of earnings before interest and taxes (EBIT) to total assets and measures RSO performance. Following the approach of Alessandrini et al. (2009), La Rocca et al. (2010), Deloof and La Rocca (2015), and others, I measure local banking development as the number of bank branches (national, cooperative, and foreign) per 1,000 inhabitants in the province. The set of factors that influence the performance of RSOs is broad, for which I include a large set of control variables. Specifically, Dummy Debt is a dummy that equals one if the RSO uses short or long-term bank debt and controls for the level of indebtedness. Cash Holdings is the ratio of cash and cash equivalents scaled by total assets. The presence of cash in the RSOs balance sheet is important as substitute of bank debt to develop new investments. Intangibles is the ratio of intangible assets over total assets. This variable is important as it controls for those assets that represent the main source to catch growth opportunities. Tangibility is the ratio of tangible fixed assets to total assets. Tangible assets may increase RSO debt capacity as they are used as collateral. Size is measured as the natural logarithm of total assets, while Age is the natural logarithm of the RSO age. Larger and older RSOs typically are less informationally opaque and can more easily obtain bank debt. Patents is the number of total number of grant patents of the RSO. The number of intellectual properties could influence corporate performance. I also include dummy variables that take into account the composition of the RSO board (Dummy Venture Capital, Dummy Industrial Firm, Dummy Financial Firm, Dummy Member Group). Moreover, I generated Dummy Incubator that equals to one if non-operating revenues outnumber sales, zero otherwise, Dummy Early Commercialization if sales outnumber non-operating revenues, zero otherwise, and

Dummy Commercialization if sales are higher than zero and operating revenues equal to zero.

Then, I control for provincial differences in the economic development, by using the variable GDP that is the natural logarithm of the real GDP at the provincial level. Fraud is measured as the mean number of fraud crimes at the provincial level scaled by population and controls for the local level of crime, which is related to local banking development (Bonaccorsi di Patti, 2009). North is a dummy that equals one if the RSO is located in the northern part of Italy and zero otherwise. This variable is important, as previous studies on financial development in Italy (e.g. Guiso et al. 2004) have shown relevant differences between the northern and the southern parts of the country. Finally, industry and year fixed effects using dummies are also included in the econometric model. Table A.1, which is shown in the appendix at the end of the chapter, synthetize the variables description.

2.4.3 Descriptive statistics

Table 1 shows the descriptive statistics for the variables. It presents mean, standard deviation, minimum value, 25th, 50th (median), 75th percentiles and maximum value for all the variables.

*** Table 1 about here ***

Descriptive statistics show a large variability of the dependent variable across the RSOs in my sample. There is also substantial variation with respect to my local banking development measure, while the variability in the control variables is in line with the extant literature in this field of research. Table 2 shows the correlation matrix of the variables.

*** Table 2 about here ***

The positive correlation between local banking development and RSO performance is statistically significant at the 0.05 level. Then, I tested possible multicollinearity among the independent variables by using the variance inflation factors (VIFs) that

estimate how the variance in my regression coefficients is inflated due to multicollinearity. The maximum VIF in the model is 1.64 (mean of 1.21) which is far below the generally accepted cutoff of 10 (or, more prudently, 5) for regression models. Therefore, no bias was detected in the significance of the results.

2.5 Empirical Results

2.5.1 Local banking development and research spin-offs' performance

Table 3 shows the effect of local banking development on RSO performance before (column 1 and 2) and after the incubation period (columns 2-6).

*** Table 3 about here ***

From a statistical point of view, the outcome of the analysis is valid and robust. For the 2SLS regressions, the F-test statistic of the first stage regression shows that the instruments are jointly significant when estimating the local banking development. The p-values of the instruments, based on heteroscedastic robust standard errors, are statistically significant.

The lack of statistical significance of the Local Banking Development coefficient in column 1 highlights that the provincial development of the banking sector does not affect RSO performance during the incubation period, i.e. when non-operating revenues outnumber sales. It seems that RSOs in the early stages of their lifecycle mainly rely on public or university contribution and, consequently, their performance is not influenced by the state of development of the banking system. Thus, when the major source of revenues comes from non-operating revenues, the role of local banking development is meaningless and Hypothesis 1 is confirmed.

Differently, columns 3 and 5 show that when RSOs are no longer dependent from public or university funds, the effect of local banking institutions on RSO performance interestingly becomes positive and statistically significant, confirming the Hypothesis 2. Once RSOs have started selling their products or services, the dependence from non-operational earnings decreases and the relationship with banks becomes important. At

this time, RSOs deal with market competitions and are in search of funds to finance their investments. Here comes into play the role of the banking system, which is crucial to RSO growth and performance. It seems that the proximity between the RSOs and a loan office enhances personal contacts and accelerates the acquisition of soft information, for which RSOs can more easily obtain external finance. This reduce RSO financial constraints and bank debt can be used to catch valuable business opportunities and face the market challenges.

These evidences are corroborated by the results of columns 2, 4 and 6, whose models include Dummy Incubator (column 1), Dummy Early Commercialization (column 2) and Dummy Commercialization (column 3) and their respective interaction terms with the independent variable Local Banking Development. In particular, while in column 1 the interaction term is not statistically significant, in columns 2 and 3 it is. In order to have a clearer interpretation of the results, it is useful to show graphically the partial effect of local banking development on RSO performance conditional for the phase of the RSO life cycle. Therefore, for a better understanding of the results, I report the following Figures 2 and 3.

Figure 2 – Marginal effect of Local Banking Development on RSO performance conditioned by the early commercialization phase

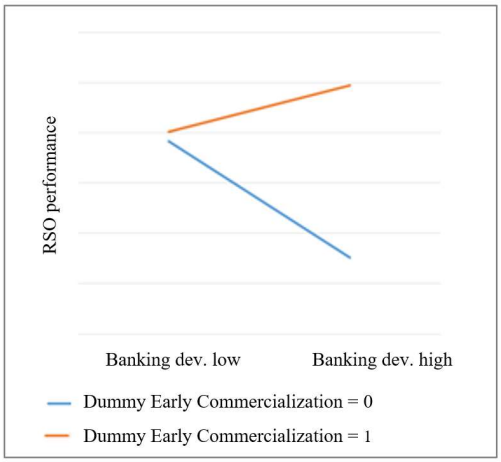
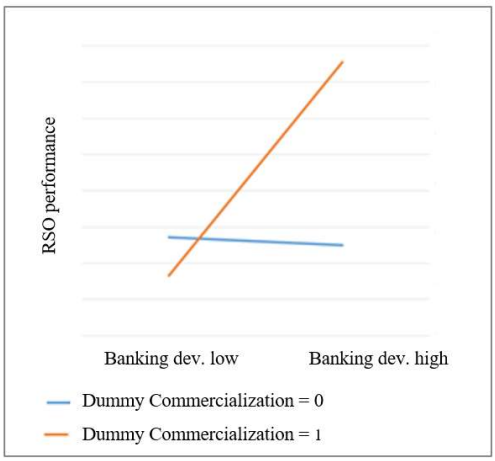


Figure 3 – Marginal effect of Local Banking Development on RSO performance conditioned by the commercialization phase



Figures 2 and 3 interestingly confirm that during the early commercialization and commercialization phases, an increase in the development of banking markets corresponds to an increase in the performance of RSO. *Vice versa*, when sales are loI r than non-operating revenues, the local banking sector does not matter.

With regard to the firm-specific control variables, it is interesting to notice that the use of debt and the amount of cash reserves do not influence the performance of RSOs when they rely on public sources of funding during the incubation period. Inversely, after the incubation period, bank debt and cash buffers play an important role to finance the growth of RSOs. Moreover, the presence of venture capitalists in the RSO board seems to be particularly important at all stages of a ROS life cycle.

The findings aim to enrich the both the literature on RSOs and the literature on banking development. In particular, I contribute to the RSO research studying an important determinant of corporate success that should be carefully considered both by academic researches and decision makers. Moreover, I also contribute to the corporate finance literature investigating a particular typology of firms for which, in the early stages of their life-cycle, the role of the banking system as credit provider is in competition with other sources of funding, namely public or University contributions.

2.5.2 Further test: the moderating role of bank debt

As first further test, I investigate the moderating role of bank debt on the relationship between local banking development and RSO performance. This is an important aspect to consider, as the main relationship studied could be driven by the presence of bank debt in the RSO balance sheet. Figure 4 reports the regression results using the interaction term *Local Banking development*Dummy Bank Debt* as moderating variable.

Figure 4 – Marginal effect of Local Banking Development on RSO performance conditioned by Bank Debt

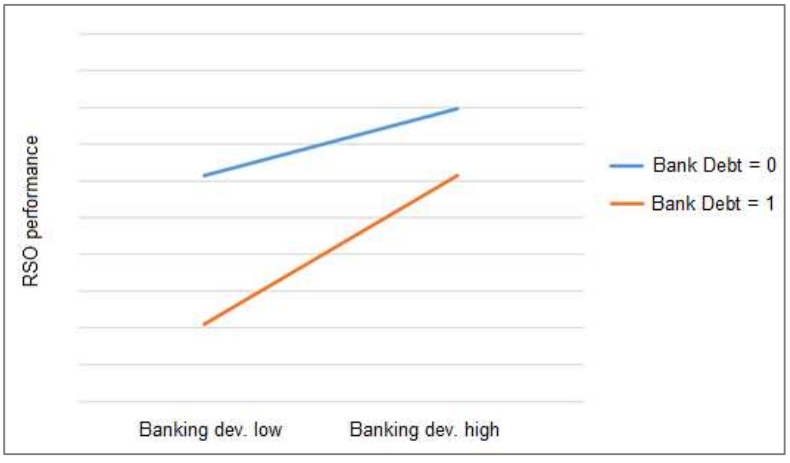


Figure 4 plots the two-way interaction effects for unstandardized variables. The graph shows that the effect of the banking sector on corporate performance is stronger for those RSOs using bank debt. Therefore, the banking environment matters especially to RSOs that use bank debt. It is possible to notice that local banking developments is also important to RSOs that do not use bank debt[17], but to a lesser extent. A possible explanation is that the value-enhancing use of debt has spillover effects to the other spin-offs operating in the same industry.

2.5.3 Further test: start-up and comparable firms

As second further test, I collected a sample of 680 control firms, using the database Bureau van Dijk, composed of 433 innovative-start-ups (selected according to the Italian legislation definition) and 247 comparable firms. This test is important as innovative and comparable firms have similar characteristics to RSOs. The comparable sample was selected considering for each spinoff all the firms with the same NACE code operating in Italy (which is, according to Guiso and Zingales (2004), the most appropriate dimensional geographic entity). Then, I used the propensity score method (Rosenbaum and Rubin, 1983) to estimate the effect of the treatment (namely, being a spinoff). More in detail, I used the nearest neighbor matching method (Friedman et al 1977) to select a single comparable firm for every spinoff, obtaining a control sample of 247 comparable firms. The number of firms in this sample is far below the number of spinoffs because often the same "comparable" refers to many spinoffs with the same NACE code and characteristics in terms of size, debt and profitability. Then, I created a dummy equal to one if the company is an innovative-start-up or a comparable firm, zero otherwise, and I performed the 2SLS main model for this control sample. Results are reported in the following Table 4.

*** Table 4 about here ***

[17] i.e. those companies that have no access to bank debt (zero-leverage constrained RSOs) or do not want use bank debt (zero-leverage unconstrained RSOs).

It interesting to notice that, differently to RSOs, innovative-start-ups and comparable firms are affected by the degree of development of the local banking markets during all the phases of their life cycle (columns 1, 2 and 3). I confirm that, differently to RSOs, they are sensitive to the presence of local bank branches also before the entrance in the product market.

2.5.4 Robustness tests

The following Table 5 reports the first robustness test based on the ordinary least squares technique with clustered standard errors. This approach is important because it allows controlling for observations that are correlated under the provincial dimension. Hence, regressions correct the standard errors for the possible dependence of the residuals within clusters, as they consider that the variable measuring local banking development varies at the provincial level.

*** Table 5 about here ***

Results confirm that also when performing the OLS cluster approach, local banking institutions are important to RSO performance only once the firm mainly relies on non-public contributions. (columns 2 and 3). As second robustness test, Table 6 shows the results of the multilevel modelling analysis, which considers the different provincial levels in which the RSO operate.

*** Table 6 about here ***

The model confirms once again that also controlling for the different provincial levels, the performance of RSOs is conditioned by the quality of the banking system only after the incubation period (columns 2 and 3).

2.6 Conclusions and Implications

The importance of the academic entrepreneurship to the growth of a country is of particular interest in the research context (O'Shea et al., 2008). In this field of research, investigating how RSOs interact with the banking institutions is a relevant topic that enriches the understanding of RSO success. Indeed, if the access to the banking markets is a major concern for firms, this especially applies to innovative firms, such as research spin-offs, whose activities are expensive and require well-developed financial systems (Sharma, 2007; Ayyagari et al., 2007). RSOs are the result of high technological academic research and entail a long engineering period before the marketing of their products or services. During the initial period, RSO capitals are mainly composed of public contributions, while in the maturity phases RSOs largely rely on other sources of external finance, such as bank debt. Considering this peculiarity, it is of academic and practical interest to study the role of the banking system on the activities of RSOs during their life-cycle.

The present study deepens this aspect, investigating how the performance of 1,947 Italian RSOs is influenced by the surrounding banking sector. The findings, based on two-stage least squares regressions, evidence that during the incubation period banks play a marginal role in the performance of RSOs. It seems that the availability of public contributions does not push innovative spin-offs to look for bank funding. Otherwise, when public capitals are no longer available, RSOs increase their use of bank debt and the development of the banking institutions becomes important. Moreover, the results highlight that the influence of the local banking development on the performance of RSOs is higher when the RSO uses bank debt, interestingly revealing a value-enhancing use of debt.

The chapter has important practical implications both for policy-makers and entrepreneurs. The key implication of the findings is that bank and RSOs should try to better meet each other's needs. They can no longer overlook each other throughout the critical prototyping phases, during which the success of the idea could significantly depend from the availability of financial resources. At the same time, policy makers should ensure the necessary priority attention to the banking sector, recognizing that it acts as a force that boosts the growth of spin-offs. The governments should develop

banking instruments that support the business of RSOs. Policy makers should recognize that a close relationship between a RSO and a bank branch gives the possibility to undertake successful growth opportunities. Thus, policy makers should increase the availability of debt financing for RSOs in those provincial banking contexts with few branches. With this regard, bank promoters could explore and deepen the credit need of ROSs and reduce their financial constraints.

Moreover, the banking institutions should support the consolidation of innovative RSOs not only during the maturity stages, but also throughout the early phases of their life-cycle. It is true that spin-off new initiatives benefit from University or research institutes funds. However, public contributions are not always available and in a condition of funding absence productivity is constrained. Moreover, public contributions may not be sufficient to assure the RSO activities and, sometimes, public contributions are not available to all the typologies of spin-offs. When the incubation is still ongoing, the spin-off works on the proof of concepts and prototypes. These activities require significant financial resources often additional to the public ones. Too many RSOs initiatives do not come to light because do not obtain adequate financial resources, despite the high quality of the idea. For these reasons, bank branches should support RSOs also during their incubation period, where public and banking funds could go hand in hand. This can occur through short-term loans, which require less collaterals, or long-term debt, providing the right financial tools to support the acquisition of assets in place and patents. Additionally, banks could establish dedicated funds to RSOs, such as financial incentives for specific academic projects.

Hence, the development of the local banking markets could represent a resource that allows a RSO to both enter the market and, then, face the competition.

Moreover, well-developed banking institutions not only guarantee the availability of liquidity, but also facilitate the trade, providing a mechanism for sharing resources and splitting the industry risk among many RSOs. Therefore, the banking sector has a key role in order to reduce the uncertain of future cash flows, which is a major concern for RSOs.

From a firm-level point of view, managers of RSOs should try to reduce the informational gap between their company and the money lenders. Too many times banks have no idea of the high income potential from valuable projects. The initial

location of a RSOs could mitigate such problem. RSOs could try to reduce the physical and informational distance from the nearest bank branches in order to facilitate debt financing. Moreover, RSO managers should not ignore the possibility to rely on bank loans and could establish the production facilities as close as possible to high bank branch density areas.

Countries cannot afford to miss the opportunity to commercialize the results of public research, as it contributes to economic and social welfare. In light of this, this contribution hopes to increase the understanding of the mechanisms through which the application of new ideas, technologies and scientific knowledge generates economic development and job creation.

The chapter contribute to the literature that analyzes the role of the banking system, as crucial driver to boost spin-offs' performance, by proposing an empirical analysis on the Italian. The chapter also has some limitations, as I use only one proxy of local banking developments, i.e. bank branch density. Indeed, to confirm my findings it would be useful to consider, as proxy of local banking development, also the total amount of credit banks extend to firms as a percentage of GDP. However, this work underscores the need for more research on financial policies in very early stage of RSOs, encouraging future researchers to further study the debt policies of RSOs.

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Table 1 - Descriptive Statistics for the sample.

	Mean	Sd	min	p25	Median	p75	max
ROA	-0.015	0.426	-4.706	-0.050	0.039	0.125	0.686
Local Banking development	0.586	0.158	0.209	0.495	0.574	0.702	1.074
Dummy Bank Debt	0.437	0.496	0.000	0.000	0.000	1.000	1.000
Cash Holdings	0.229	0.246	0.000	0.027	0.138	0.353	1.000
Intangibles	0.172	0.228	0.000	0.008	0.058	0.265	0.923
Tangibility	0.088	0.143	0.000	0.004	0.029	0.104	0.862
Size	5.127	1.647	0.365	4.013	5.133	6.194	10.069
Age	1.553	0.813	0.000	1.099	1.609	2.197	4.263
Patents	0.658	2.529	0.000	0.000	0.000	0.000	27.000
Dummy Venture Capital	0.091	0.288	0.000	0.000	0.000	0.000	1.000
Dummy Industrial Company	0.591	0.492	0.000	0.000	1.000	1.000	1.000
Dummy Financial Company	0.148	0.355	0.000	0.000	0.000	0.000	1.000
Dummy Member Group	0.305	0.460	0.000	0.000	0.000	1.000	1.000
GDP	0.284	0.000	0.283	0.283	0.283	0.284	0.285
Fraud	0.209	0.074	0.000	0.170	0.203	0.254	0.565
North	0.648	0.478	0.000	0.000	1.000	1.000	1.000

Note: industry and year dummies are not reported

Table 2 – Correlation matrix

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	VIF
1	ROA	1.00																
2	Banking development	0.07**	1.00															1.22
3	Dummy Bank Debt	-0.01	-0.02	1.00														1.24
4	Cash Holdings	0.03	0.01	-0.27***	1.00													1.37
5	Intangibles	-0.15***	-0.02	-0.03	-0.22***	1.00												1.22
6	Tangibility	0.03	0.01	0.07***	-0.21***	-0.18***	1.00											1.13
7	Size	0.11***	0.02	0.38***	-0.36***	-0.07**	0.16***	1.00										1.64
8	Age	0.13***	0.05*	0.18***	-0.09***	-0.17***	0.08***	0.41***	1.00									1.26
9	Patents	-0.07**	0.12***	0.10***	-0.05*	0.10***	-0.00	0.30***	0.22***	1.00								1.18
10	Dummy Venture Capital	0.02	-0.15***	0.10***	-0.03	-0.02	0.02	0.15***	0.04*	0.08***	1.00							1.12
11	Dummy Industrial Company	0.04+	0.08***	0.01	0.01	-0.06**	0.03	0.16***	0.13***	0.12***	0.15***	1.00						1.07
12	Dummy Financial Company	0.03	0.02	0.02	-0.02	-0.04+	-0.05*	0.15***	0.11***	0.07***	0.28***	0.10***	1.00					1.07
13	Dummy Member Group	0.06**	0.04	0.03	-0.03	-0.04*	0.05*	0.19***	0.16***	0.09***	0.10***	0.06**	0.13***	1.00				1.06
14	GDP	0.03	0.10***	-0.01	-0.03	-0.03	0.05*	0.01	0.11***	0.06**	-0.02	0.03	0.00	0.02	1.00			1.12
15	Fraud	-0.00	-0.23***	0.03	-0.00	0.04+	-0.05*	-0.06**	-0.11***	-0.11***	-0.06**	-0.08***	-0.06**	-0.06**	-0.26***	1.00		1.26
16	North	0.07**	0.27***	0.13***	-0.02	-0.03	-0.02	0.07***	0.02	0.01	-0.19***	-0.07**	-0.03	0.07**	-0.02	0.21***	1.00	1.23

Notes: Industry dummies are not reported. Significance: + p < 0.10, * p < 0.05, ** p < 0.01, *** p < 0.0

Table 3 - Main Model: 2SLS results concerning local banking development and RSO performance.

	(1)	(2)	(3)	(4)	(5)	(6)
Estimation technique:	2SLS	2SLS	2SLS	2SLS	2SLS	2SLS
	Sub-sample analysis			**Interactions' analysis**		
Conditions:	Sample of RSOs in the **incubation phase**	Sample of RSOs in the **early commerciali zation phase**	Sample of RSOs in the **commerciali zation phase**	Full sample: interaction with **Incubation phase**	Full sample: interaction with **early commerciali zation**	Full sample: interaction with **commerciali zation phase**
Dependent Variable	ROA	ROA	ROA	ROA	ROA	ROA
Local Banking Development	-0.470	0.239*	0.551**	0.097	-0.365	-0.014
	(0.334)	(0.129)	(0.271)	(0.141)	(0.333)	(0.120)
Dummy Incubator				0.086		
				(0.156)		
Local Banking Develop. * Dummy Incubator				-0.321		
				(0.262)		
Dummy Early Commercial.					-0.199	
					(0.177)	
Local Banking Develop. * Dummy Early Commercial.					0.512*	
					(0.310)	
Dummy Commercialization						-0.179
						(0.159)
Local Banking Develop. * Dummy Commercialization						0.387*
						(0.199)
Dummy Bank Debt	0.024	-0.070***	-0.334*	-0.046*	-0.046*	-0.040
	(0.061)	(0.025)	(0.192)	(0.027)	(0.027)	(0.030)
Cash Holdings	-0.212	0.146**	0.493**	0.093	0.094	0.090
	(0.293)	(0.061)	(0.242)	(0.087)	(0.087)	(0.088)
Intangibles	0.271	-0.230***	0.518	-0.163**	-0.165**	-0.190***
	(0.227)	(0.082)	(0.354)	(0.069)	(0.069)	(0.063)
Tangibility	0.083	-0.185*	-0.074	-0.126	-0.126	-0.147*
	(0.190)	(0.100)	(0.181)	(0.079)	(0.080)	(0.078)
Size	-0.037	0.046***	0.111**	0.027	0.027	0.024
	(0.058)	(0.014)	(0.048)	(0.019)	(0.019)	(0.019)
Age	0.029	0.017	0.058	0.025	0.023	0.029
	(0.085)	(0.018)	(0.067)	(0.025)	(0.026)	(0.029)
Patents	-0.009	-0.012	-0.033**	-0.011	-0.010	-0.012
	(0.010)	(0.010)	(0.017)	(0.011)	(0.011)	(0.011)
Dummy Venture Capital	0.453***	0.116**	0.768***	0.127***	0.127***	0.140***
	(0.151)	(0.052)	(0.236)	(0.045)	(0.048)	(0.048)
Dummy Industrial Company	0.202**	-0.050*	-0.019	-0.004	-0.006	0.005
	(0.089)	(0.028)	(0.084)	(0.026)	(0.026)	(0.027)
Dummy Financial Company	-0.020	0.012	0.206**	0.015	0.014	0.034
	(0.118)	(0.044)	(0.096)	(0.053)	(0.053)	(0.055)
Dummy Member Group	0.028	0.014	0.122	0.039**	0.041**	0.041**
	(0.068)	(0.021)	(0.091)	(0.019)	(0.019)	(0.019)
GDP	-1.580	-0.196	3.908**	-53.026	-47.824	-61.291
	(1.396)	(0.413)	(1.717)	(44.275)	(44.989)	(45.361)
Fraud	-1.244	0.065	-0.181	-0.114	-0.129	-0.017

	(0.757)	(0.204)	(0.648)	(0.205)	(0.211)	(0.219)
North	0.220**	-0.026	0.003	0.023	0.022	0.031
	(0.092)	(0.021)	(0.051)	(0.025)	(0.026)	(0.028)
Industry Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	225	1104	201	1329	1329	1329
R-squared	0.234	0.189	0.310	0.134	0.133	0.127

Notes: Industry and year fixed effects are the controls. The 2SLS model uses the same instrumental variables as in Deloof and La Rocca (2015) and Deloof et al. (2019) for the local banking structures in 1936 that were largely determined by factors unrelated to local economic development. The superscripts denote significance as follows: *p< 0.10, **p< 0.05, ***p< 0.01. Regressions report standard errors in brackets.

Table 4 – 2SLS technique: results concerning local banking development and the performance of innovative-start-ups and comparable

Estimation technique:	(1) 2SLS	(2) 2SLS	(3) 2SLS
Conditions:	Start-up and comparable Early stages	Start-up and comparable Early commercialization	Start-up and comparable Commercialization
Dependent variable	ROA	ROA	ROA
Local Banking Development	0.199** (0.087)	0.537** (0.226)	0.811* (0.444)
Control Variables	Yes	Yes	Yes
Observations	94	539	116
R-squared	0.794	0.292	0. 426

Notes: Industry and year fixed effects are the controls. The 2SLS model uses the same instrumental variables as in Deloof and La Rocca (2015) and Deloof et al. (2019) for the local banking structures in 1936 that were largely determined by factors unrelated to local economic development. The superscripts denote significance as follows: *p< 0.10, **p< 0.05, ***p< 0.01. Regressions report standard errors in brackets.

Table 5 – OLS cluster technique: results concerning local banking development and RSO performance

Estimation technique:	(1) OLS Cluster	(2) OLS Cluster	(3) OLS Cluster
Conditions:	RSOs Incubated	RSOs Early commercialization	RSOs Commercialization
Dependent variable	ROA	ROA	ROA
Local Banking Development	-0.360 (0.458)	0.209** (0.089)	0.421* (0.219)
Control Variables	Yes	Yes	Yes
Observations	225	1105	201
R-squared	-0.070	0.543	0.113

Notes: Industry and year fixed effects are the controls. The superscripts denote significance as follows: *p< 0.10, **p< 0.05, ***p< 0.01. Regressions report standard errors in brackets.

Table 6 – Multilevel technique: results concerning local banking development and RSO performance

Estimation technique:	(1) Multilevel	(2) Multilevel	(3) Multilevel
Conditions:	RSOs Incubated	RSOs Early commercialization	RSOs Commercialization
Dependent variable	ROA	ROA	ROA
Local Banking development	-0.360 (0.410)	0.210** (0.102)	0.419* (0.219)
Control Variables	Yes	Yes	Yes
Observations	225	1105	201
R-squared	-0.015	0.119	0.070

Notes: Industry and year fixed effects are the controls. The superscripts denote significance as follows: *p< 0.10, **p< 0.05, ***p< 0.01. Regressions report standard errors in brackets.

APPENDIX

Table A.1 – Variables descriptions.

Dependent variable	***Calculation***	***Role***
ROA	earnings before interest and taxes (EBIT) / total assets	Dependent variable
Explanatory variables		
Local Banking Development	(Total Bank Branches at provincial level × 1000) / Population at provincial level	Independent variable
Dummy Debt	Dummy equal to 1 if the RSOs employs short-term or long-term Bank Debt bank debt, 0 otherwise	Controls for RSO indebtedness
Cash Holdings	Cash & cash equivalents / total assets	Controls for RSO level of cash
Intangibles	Intangible Assets / Total Assets	Controls for those assets that could generate high growth opportunities
Tangibility	Tangible Assets / Total Assets	Controls for the typology of assets
Size	ln(total assets)	Controls for RSO dimension
Age	ln(age)	Controls for RSO age characteristics
Patents	Number of Patents of the RSO	Controls for RSO intellectual properties
Dummy Venture Capital	Dummy equal to 1 if in the RSO's board there is at least a venture capitalist, 0 otherwise	Controls for the typology of investors
Dummy Industrial Firm	Dummy equal to 1 if in the RSO's board there is at least an industrial company, 0 otherwise	Controls for the industrial expertise of the board of directors
Dummy Financial Firm	Dummy equal to 1 if in the RSO's board there is at least a Bank or a financial institution, 0 otherwise	Controls for the financial expertise of the board of directors
Dummy Member Group	Dummy equal to 1 if the RSO is a member of an industrial group, 0 otherwise	Controls for the composition of the board of directors
GDP	Natural logarithm of the real GDP at the provincial level	Controls for GDP at the provincial level
Fraud	Mean number of Fraud Crimes at the provincial level scaled by population	Controls for the level of crime at provincial level
North	Dummy equal to 1 if the firm is located in the northern part of Italy, 0 otherwise	Controls for north-south differences.

Chapter 3

Does Local banking development Still Matters? The game-changing role of FinTech

Abstract

Noteworthy contributions highlighted that local banking development matters to corporate financial policies, as the geographic proximity between the firm and the bank branch alleviates asymmetric information problems and increases the use of bank debt. The advent of new digital technologies in the information collection processes could open new horizons and change the role of local banking institutions in the near future. This study, using a large panel sample of Italian SMEs from 2011 to 2019, investigates whether the rapid increase of FinTech instruments during the last decade shapes the influence of local banking development on SMEs debt decisions. The findings interestingly suggest that FinTech mitigates the effect of local banking markets on SMEs indebtedness level. However, despite the arrival on the scene of FinTech, local banking development is still extremely relevant and the bank-firm close human ties remain important in debt contract negotiations.

Keywords: Fintech, local banking development, bank, debt

3.1 Introduction

The future of banking is influenced by the rapid development in digitization, which has revolutionized the financial services industry (Puschmann 2017). The use of new technologies has changed the banking business worldwide and the 'financial technology' (FinTech) became essential in the banking relationship (Romānova and Kudinska, 2016). Recently, banks increased their investment in IT, which accounts for 15–20% of total costs (Gopalan et al. 2012). FinTech has become a challenge, but also an opportunity as it provides more flexibility, better functionality in some areas, and aggregation of services (Romānova and Kudinska, 2016). These recent tendencies stimulated a growing academic interest in this area, generating a rapid increase of papers studying the relationship between banks and FinTech. A recent paper of Thakor (2020) reviews the existing literature on FinTech and its interaction with banking. The author points out that there is still much that "we do not know" about the bank-FinTech relationship. An important issue in this field of research regards the role that FinTech plays in the information collection processes (Jakšič and Marinc 2019). Indeed, credit contracts are almost exclusively based on information (Puschmann 2017) and the information-gathering process has been historically based on personal repeated contacts between the firm and its bank branch (Diamond 1984). The mitigation of bank-firm information asymmetries is the essence of the banking relationship (Greenbaum et al. 2016) and builds its grounds on the human interactions that allow the bank to acquire 'soft' information about the company, thereby facilitating loan provision. Indeed, the face-to-face meets between the banker and the entrepreneur simplify screening and monitoring activities, reducing the information gap. This is particularly important to informationally opaque firms, typically small and medium sized enterprises (SMEs) that have limited access to external finance because of their asymmetric information problems (Beck et al. 2005; Petersen and Rajan 2002; Berger and Udell 1998).

The extant financial literature quantifies the bank-firm physical proximity in terms of bank branches concentration, which is a traditional dimension of local banking development. The contribution of Guiso et al. (2004) is the forerunner paper studying local banking development and suggests that the bank branches density is positively related to growth. This work has been enormously influential and inspired a large body

of literature in this field. For instance, La Rocca et al. (2010) employ the same indicator of local banking development as in Guiso et al. (2004), finding that well-developed local banking markets alleviates asymmetric information problems and increases SMEs used of debt. Hence, SMEs benefit from the closeness of loan officers, who can rapidly assess their credit worthiness (Pollard 2003; Alessandrini et al. 2009; La Rocca et al. 2010; Deloof and La Rocca 2015; Deloof et al. 2019).

In this banking context, where information has an extraordinary value, the advent of new digital technologies in the information collection procedures has opened up a whole new frontier that could change the role local banking development in the years ahead. Indeed, FinTech could play a breakthrough role in the bank-firm relationship, as the digitization represents an interesting new opportunity to improve the way information is processed by banks. As evidenced by Jakšič and Marinc (2019), this does not mean that the bank should abolish the close personal interaction with the entrepreneur, which is at the core of the banking relationship, but rather should get this opportunity to overcome some weaknesses in the information collection process. It is true that non-quantifiable soft information is difficult to obtain in impersonal ways (Liberti and Petersen 2017), such as FinTech. However, bank could take advantage from FinTech in order to reduce the 'distance' from the firm when it is logistically difficult to have a live personal interaction. With this regard, an advanced method of collecting quantifiable hard information based on artificial intelligence and FinTech could strengthen the bank-firm relationship by integrating and not replacing the human ties that are inevitably characterized by bounded rationality (Jakšič and Marinc 2019). On this basis, the present work studies whether the explosive increase of FinTech instruments during the last decade shapes the influence of local banking development on SMEs financial policies. The results highlight that FinTech mitigates the effect of local banking development on SMEs use of debt. The intensification of innovative FinTech services reduces the influence of bank branches on SMEs level of indebtedness. However, this moderating effect does not apply for cooperative bank branches. The growth of FinTech does not seem to influence lending strategies of such bank branches, whose decisions are mainly based on 'soft' information rather than 'hard' information based on FinTech.

I also find that despite FinTech is rapidly spreading around the banking world, the local financial sector is still highly important. Firms are still in need of human bankers and personal contacts that cannot be fully substituted by FinTech. The discretion of a banker can be difficulty be substitute by FinTech and is particularly important to informationally opaque SMEs. However, a key implication of the findings is that the importance of bank branches concentration is changing, for which in the near future banking institutions should rethink the business model of their branches in the light of the ongoing growth of digitization that leads to the automation of acquisition information processes. A new idea of bank-firm digital proximity could complement the benefits due to the geographical proximity. Also the recent coronavirus pandemic changed firm approach towards banks, as entrepreneur appreciate online service that are accessible anywhere. This and the constant IT expansion should induce Governments to support banks during the online transition in order to strengthen the banking relationship.

The reminder of the chapter is structured as follow. Paragraph two depicts the Italian context. Paragraph three reports the literature review and the hypotheses development. Paragraph four focuses on data, methodology, and variables. Paragraph five reports the results and Paragraph six concludes, also providing some implications.

3.2 The Italian context

Following the approach of Guiso et al. (2004), La Rocca et al. (2010) and others, I study local banking development in Italy, which is a country in which there are differences in the banking development across provinces. These differences make Italy a perfect context of analysis. Italy is a bank-based economy like many other European countries, such as France, Germany and Spain. From 1936, the competition and the establishment of new bank branches was limited by the existing legislation and Italian banks were under the state control. In 1990, a new regulation allowed the consolidation and the sale of state-held banks.

Most of Italian banks operate nationwide. In 2019, 76% of the total number of bank branches in Italy were from national banks, while cooperative banks ("Banche di Credito Cooperativo", BCC) accounted for 18% of the total bank branches in Italy in

2019. Bank debt is the single most important source of financing for SMEs in Italy, where banking markets play a very minor role in corporate finance (Beck et al. 2008; Agostino et al. 2011).

With respect to corporate governance, Italian firms are in general actively managed by their owners, and there is not a marked separation between ownership and control (Bianco and Casavola 1999; Giacomelli and Trento 2005). Most Italian firms are SMEs that are family owned and operate in mature industries. These features makes local banking development important to Italian SMEs. Therefore, banking institutions have a key role for Italian SMEs policies, even in an integrated financial market. This growth is particularly important for provinces in the south of Italy, which are economically underdeveloped. Considering all these arguments, I can conclude that the Italian setting is a worthwhile case study to study local banking development and the moderating role of FinTech.

3.3 Literature review and hypotheses development

3.3.1 Literature review

The Financial Stability Board defines FinTech as the "technologically enabled financial innovation that could result in new business models, applications, processes, or products with an associated material effect on financial markets and institutions and the provision of financial services." FinTech generates economies of scale in the processing of banking services (Li and Marinč 2018). Internet banking allows to implement banking activities without geographic limitations (Khedmatgozar and Shahnazi 2018). Jakšič and Marinč (2015) recognise four areas in which FinTech mainly impacts on banks: improved communication, decision-making, automation, and empowerment of bank customers.

This rapid increase of FinTech in financial markets stimulated the financial literature to study its effects on banking institutions (Navaretti et al. 2018) and financial stability (Demertzis et al., 2017, Vives, 2017). The banking world is wondering whether FinTech can completely substitute banks (Boot 2017). The disruptive advent of

FinTech encouraged many researches in this field. The work of Thakor (2020) reviews the existing literature on FinTech and banking. The author observes that FinTech run three phases: from 1866 to 1967 when is started the rapid transmission of financial information through for instance the telegraph. From 1967 to 2008 when the electronic payments where introduced and from 2008 to the present where the use of IT technologies rapidly increased. He also argues that FinTech is difficult to quantify, as there are different definitions of FinTech. An important stream of research in this field investigates how the hard non codifiable information obtained through FinTech could change the role of loan officers who collect soft information via direct personal contacts (Uchida et al. 2012). Some works suggest that personal interactions are still important even in a digital banking world (Ferri and Murro 2015; Marinč 2013; Grunert and Norden 2012). Thus, the discretion of a banker matters (Cerqueiro et al. 2011), especially for SMEs that face more asymmetric information problems (Berger and Udell 1998) and despite such discretion is based on 'soft' information that could also be manipulated (Berg et al. 2016). Personal interactions between the entrepreneur and the bank are more frequent when the bank branch and the firm closely operate. Indeed firms benefit from a well-developed local banking system in terms of bank branches concentration (Guiso et al., 2004; Kendall, 2012). Guiso et al. (2004), based on the Italian context, suggest that local banking development significantly matters for corporate growth, despite the globalisation of financial markets. This applies only for informational opaque SMEs, whose asymmetric information problems make local banking development particularly important to them (Pollard, 2003; Beck et al., 2005; Alessandrini et al., 2009). The close relationship between the SME and the bank due to the physical proximity reduces the asymmetric information gap (Petersen and Rajan 2002) and, consequently, SME financial constraints. Starting from the contribution of Guiso et al. (2004), the financial literature studied the relationship between local banking development and corporate financial policies of SMEs. Noteworthy articles studied how the development of banking markets positively influences the use of debt (Palacín-Sánchez and Di Pietro, 2016; La Rocca et al., 2010; González and González, 2008; Utrero-González, 2007) and trade credit (Deloof and La Rocca, 2015). Alessandrini et al. (2009) carry out a study based on the same context ad Guiso et al. (2004), observing that the geographic distance between the firm and the bank reduces

the amount of debt used by SMEs. La Rocca et al. (2010) similarly evidence that higher levels of banking development in terms of bank branch density favours credit provision to SMEs. The same results are observed in Spain, where exactly as in Italy the differences in the level of debt of SMEs lie in the differences in the local financial institutions (Palacín-Sánchez and Di Pietro, 2016; González and González, 2008; Utrero-González, 2007). Therefore more developed banking institutions facilitate the acquisition of 'soft' information on SMEs (Howorth and Moro 2006), reducing information asymmetries and increasing the access to bank finance.

In this context, the new internet banking increases the efficiency of banking processes, but decreases the baker-entrepreneur human interactions. This could influence the collection of 'soft' information. Indeed, as highlighted by the extant literature, banking consolidation and the financial technology reduce credit availability, especially for SMEs (Sapienza, 2002, Degryse and Ongena, 2005, Berger and Frame, 2007). It therefore appears important to investigate how FinTech influences the effect of local banking development on SMEs financial choices.

3.3.2 Hypotheses development

Asymmetric information is the situation in which one of two parts is better informed than the other. Asymmetric information problems arises in the presence of adverse selection and moral hazard. Adverse selection occurs when one part does not know the qualities of the counterpart before the contract is closed. Moral hazard takes place after the contract is closed, when one of the two parts cannot acquire enough information about the counterpart.

Information asymmetry due to adverse selection and moral hazard problems is a major concern in financial markets (Gan and Riddiough 2008; Nier and Baumann 2003; Myers and Majluf 1984; Stiglitz and Weiss 1981; Leland and Pyle 1977). Personal contacts between the bank and the firm found the banking relationship (Diamond 1984) and mitigate information asymmetries (Greenbaum et al. 2016). Repeated personal interactions allow the bank to acquire soft information that is at the core of credit provision (Boot 2000) and is difficult to codify.

In a world of information imbalance, the existing literature, starting from the work of Guiso et al. (2004), interestingly observed that local banking development, in terms of

bank branches concentration, increases personal contacts, reduces asymmetric information problems and has a positive effect on firm financial policies, especially for SMEs (Palacín-Sánchez and Di Pietro 2016; Deloof and La Rocca 2015; La Rocca et al. 2010; Alessandrini et al. 2009; González and González 2008; Utrero-González,2007; Beck et al. 2005; Pollard 2003; Petersen and Rajan 2002). Guiso et al. (2004) suggest that local banking development positively influences corporate growth processes. La Rocca et al. (2010) find that the close bank-firm geographic proximity increases the use of debt by SMEs.

In this context, the new financial technologies transformed the information collection process (Jakšič and Marinc 2019). The type of information that is fundamental in the decision process of banks and FinTech could have a potential impact in this sense. FinTech diminish information asymmetries (Cappa et al. 2020) as the hard information (e.g. balance sheets or collateral guarantees) can be standardized and digitally analysed through machine learning techniques. Nowadays, internet-based banking plays a relevant role in reducing information asymmetries in banking. FinTech made it possible to obtain firm-level much valuable information through mobile and online banking platforms. The technological services provided by banks directly match the bank with the entrepreneur, providing information about the firm credit worthiness and financial needs. These developments in credit scoring lending evaluation reduce the bank-firm distance and could influence the role of local bankig development. But what the growth of hard standard information implies for the human relationships that take place in the bank branches rooms? Jakšič and Marinc (2019) rise a question: “Is online and mobile banking disrupting the role of a bank branch network - a core access channel for relationship banking?”. This interesting question introduces an important interrogation in the bank-FinTech relationship: “does bank branches concentration still matters to firms?”

Advances in digital technology kicked off a huge integration of financial markets (Lucey et al. 2018). The advent of FinTech led banks to resize their branches and increase the use of electronic channels (Nuesch et al. 2015). This resulted in a drastic decrease in the number of bank branches from 2014 to 2019, also in Italy (trovare fonte e riportare numero di filiali prima e dopo). However, despite FinTech makes bank products and services easily accessible over larger distances through online and mobile

banking (Martins et al. 2014; Khedmatgozar and Shahnazi 2018), bank branches maintain their importance. Indeed, some papers suggest that internet banking performs as a complementary channel to traditional bank branches activities rather than as its substitute (Onay and Ozsoz 2013; De Young et al. 2007; Hernando and Nieto 2007). Moreover, FinTech, being base on 'hard' quantifiable information, cannot resolve all asymmetric information problems, because 'soft' information that is a relationship-based information. can difficulty be digitalized. With this regard, Ferri and Murro (2015) interestingly point out that financial contains of informationally opaque firms are wider when loan decisions are based on technology typically created through 'hard' information.

As a result, the banking business model is moving toward a hybrid bank-firm interaction (Nuesch et al. 2015) based on combined digital and face-to-face acquired information that complement each other. This implies that FinTech cannot substitute the personal relationships that occur during physical branch visits, but could complement it. Therefore, I expect that FinTech changes, but not annihilate, the relevance of bank branches density on firms' financial decisions, for which I hypothesize:

H. 1 – FinTech shapes the effect of local banking development on SMEs financial policies.

In Italy "Banche di Credito Cooperativo" (BCC) are cooperative banks and play an important role, as they represent 18% of the bank branches in Italy in 2019. BCCs are owned by cooperative members who typically also are bank customers. By definition, they are local banks, given their legal obligation to operate in limited territorial areas (Alessandrini et al. 2009; Stefani et al. 2016). This characteristic makes them geographically close to SMEs. By operating in the local community and being owned by members of the local community, they may find it easier to acquire soft information via personal relationships with entrepreneurs, which is not available to national banks that operate at a distance (Angelini et al. 1998; Howorth and Moro 2006; Bolton et al. 2016). The lending decisions of national banks will be more based on hard and standardized information obtained through FinTech channels and less on the personal

relationship between the banker and the firm (Howorth and Moro 2006). Differently, cooperative banks that operate on a much smaller scale than national banks are probably less in need of FinTech to screen and monitor their customers, for which I expect that

H. 2 – For BCC bank branches FinTech does not affect the relationship between local banking development on SMEs financial policies.

3.4 Research design: data, methodology, and variables

3.4.1 Data

The study is based on a large sample of nonfinancial Italian SMEs. SMEs are selected according the European Commission definition in terms of employees (fewer than 250 persons), annual turnover (lower than EUR 50 million) and/or annual balance sheet total (not exceeding EUR 43 million). The period I study is from 2011 to 2019. I use unbalanced panel data that I collected from the Amadeus database of the Bureau van Dijk. Orbis has the most extensive database of financial and business information for SMEs all over the world. Moreover, using NACE codes[18] it harmonizes the financial accounts to allow for accurate comparison of firms across countries. I eliminated financial industries (NACE codes 64, 65, 66, 68, 77) as well as firms with NACE codes 84 to 90 (public administration; education; human health and social work; and creative, arts, and entertainment), NACE code 94 (membership organisations) and NACE codes 97–98 (activities of households as employers, undifferentiated goods- and services-producing by households for own use).

Restrictions on the data were imposed as follows: First, I selected all firms with accounting information over the sample period. Then, I left out economically meaningless observations with respect to accounting information. To limit the

[18] NACE is the European statistical classification of economic activities. NACE groups organizations according to their business activities. Statistics produced on the basis of NACE are comparable at European level.

potential influence of outliers, I winsorized all the firm-specific variables at the 1st and 99th percentiles (Bank Debt, Cash Holdings, Working Capital, Size, Tangibility, Intangibles, Age, Firm Growth, GDP Growth) before performing my regressions. Moreover, I removed any observations with errors (non-positive values for total book assets, negative number of years the firm has been operating) and zero sales. Thus, I obtain a sample of 1,458,450 firm-year observations over the 2008–2014 period. I also use data from other sources. Data on the density of bank branches and competition and FinTech in the bank market per province come from the Bank of Italy. Data on gross domestic product (GDP) and population per province are collected from the Italian National Institute of Statistics (ISTAT).

3.4.2 Methodology

Following the approach of Deloof and La Rocca (2015), I investigate my hypotheses first using the ordinary least squares based on clustered standard errors (OLS cluster) in order to account for multiple dimensions at the same time[19]. This approach is important because it allows controlling for observations that are correlated under two dimensions (province and firm-level). Hence, regressions correct the standard errors for the possible dependence of the residuals within clusters. Then, I perform additional tests in search of robustness of my findings. As first robustness analysis, I employ the traditional ordinary least squares (OLS) technique, while as additional robustness exam, I perform the Placebo test to make sure that the high number of observations does not lead to false statistically significant results. Table 1 synthesizes hypotheses and model.

*** Table 1 about here ***

3.4.3 Variables definition

The dependent variables measuring SME financial policies is *Bank Debt*, that is a proxy for the amount of bank debt used by SMEs. Following the capital structure

[19] I used the Mitchell Petersen's Stata routine to cluster standard errors by two dimensions (available athttps://www.kellogg.northwestern.edu/faculty/petersen/htm/papers/se/se_programming.htm).

literature (e.g., Rajan & Zingales, 1995), the financial level of indebtedness is calculated by the ratio of long-term and short-term interest-bearing bank debt scaled by total assets. As first independent variable, following the approach of Guiso et al. (2004), Benfratello et al. (2008), Alessandrini et al. (2009), La Rocca et al. (2010), and others, I measure Local banking development considering the number of national, cooperative and foreign bank branches scaled to 1,000 inhabitants in the province. This variable is widely used in the previous studies as it clearly explains the dimension of the bank branches concentration at the local level. As my indicator of local banking development is provided at the provincial level by the Bank of Italy, in order to be consistent I used the indicator of FinTech at the provincial level provided by the same Bank of Italy. More in detail, the variable FinTech is calculated as the number of bank customers using online and mobile internet banking services per province scaled to 1,000 inhabitants in the province. This variable is a proxy of local banking FinTech development.

Table 2 synthetize the variables description.

*** Table 2 about here ***

I also include a number of firm-specific variables that may influence the effects studied. *Cash Holdings* is the ratio between cash and cash equivalents scaled by total assets (e.g., Almeida et. al. 2004; Ozkan and Ozkan 2004). *ROA* is the ratio of earnings before interest and taxes (EBIT) to total assets and measures profitability. *Size* is calculated as the natural logarithm of total assets. Larger firms typically have an easier access to bank debt. *Tangibility* is the ratio of tangible fixed assets scaled to total assets. Tangible assets may increase firms financial capacity as they are used as collateral. *Age* is calculated as the natural logarithm of year minus year of incorporation. Older firms have a long history that reduces information asymmetries and increases the use of debt. *Firm Growth* is calculated as sales in year (t) minus sales in year (t-1). Growing SMEs generally require more financial resources (Binks and Ennew 1997). I also control for a provincial characteristic that may affect the results. *GDP Growth* is measured as the growth in real GDP at the provincial level from year (t-1) to year (t).

South is a dummy that that equals one if the firm is located in the southern part of Italy and zero otherwise

3.5 Empirical results

3.5.1 Descriptive statistics and correlations

Table 3 shows the descriptive statistics for the variables. It presents mean, standard deviation, minimum value, 25th, 50th (median), 75th percentiles and maximum value for all the variables.

*** Table 3 about here ***

Descriptive Statistics show that my dependent variable play a very important role in the financing of Italian SMEs, as on average debt represents 14 % of total assets. Moreover, the standard deviation of the variable *Bank Debt* (0.540) indicates a large variability of the dependent variable across the SMEs in my Italian sample. Table 3 shows that there is substantial variation also with respect to both local bankig development, while the values for the control variables are in line with the existing financial literature contributions. Table 4 reports the correlation matrix of the variables.

*** Table 4 about here ***

All the correlations different from 0.00 are statistically significant at the 0.01 level. Additionally, I tested possible multicollinearity among the independent variables by using the variance inflation factors (VIFs) that estimate how much the variance in the regression coefficients is inflated due to multicollinearity. The maximum VIF in the model is 2.48 (mean of 1.42) that is far below the generally accepted cut-off of 10 (or, more prudently, 5) for regression models. Therefore, no bias was detected in the significance of the results.

3.5.2 Local banking development and SMEs financial policies: the moderating role of FinTech

This section reports the main results of the chapter using the OLS Cluster technique. Table 5 investigates through a moderation analysis whether the level of FinTech development at the provincial level moderates the effect of local financial markets on SMEs use of debt.

*** Table 5 about here ***

The positive and statistically significant coefficients of Total Branch Density (in column 1) and FinTech (in column 2) reveal that both local banking development and FinTech considered individually increase SMEs indebtedness level. Columns 3 suggests that when local banking development and FinTech development are considered together, FinTech loses its statistical significance, which demonstrates a correlation between the two variables. Therefore, it is important to include in my regressions the interaction term (column 4) that is the moderating variable based on the variable Total Branch Density multiplied by the variable FinTech, results reveal that the marginal impact of local banking development varies according to different levels of FinTech. To better highlight the marginal impact, it is useful to consider a graph that clearly shows the partial effect of the local financial sector on SME financial policies conditional for high or low levels of FinTech. Therefore, for a better understanding of the results, I report the following Figure 1[20].

[20] Figures 1 is based on the Jeremy-Dawson graphs. For further information, see www.jeremydawson.co.uk/slopes.htm

Figure 1 - Marginal effect of local banking development on SMEs debt conditioned by FinTech

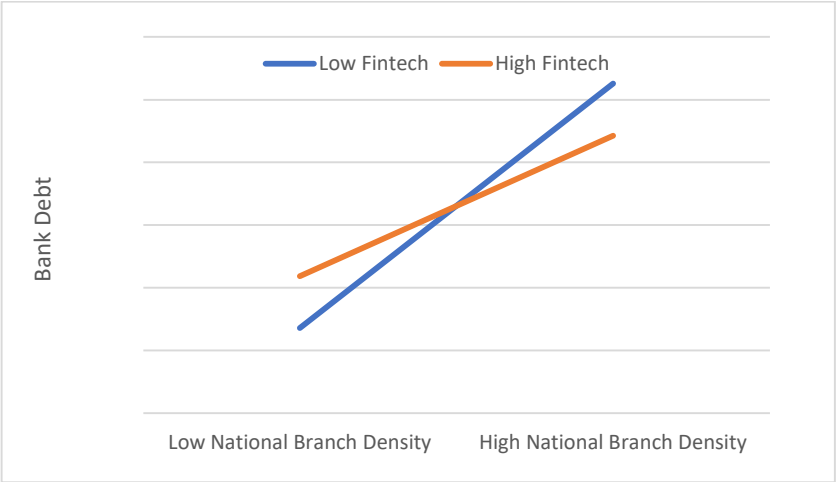


Table 6 and Figure 1 evidence that the role of bank branches concentration on SME financial decisions is different in magnitude according to different levels of FinTech. In particular, the interaction term, which I measure at the 95% confidence interval in regressions, is negative and statistically significant, indicating that the positive effect of local banking development on SME financial policies tends to decrease as the level of FinTech development rises. Therefore, new financial technologies moderates the influence of local financial markets and my first hypothesis is confirmed.

Column 1 shows a first important results of this chapter, suggesting that local banking development still matters even ten years after the work of La Rocca et al. (2010) and little less than twenty years after the milestone contribution of Guiso et al. (2004). Second, results interestingly reveal that the increasing availability of hard information due to the development of FinTech reduces information asymmetries and favors loan provisions (column 2). Moreover, my moderation study demonstrates that new financial technologies reduce the bank-firm distance, impacting on the role of bank branches concentration. It seems that when firms use online and mobile internet banking, the presence of close personal bank-firm relationship matter less. *Vice versa*, when firms rely less on FinTech instruments, the density of bank branches in local provincial contexts is most relevant. Though local banking development and FinTech provide information of a different nature (soft and hard), both of them reduce information asymmetries. This explains their substitution effect. However, FinTech cannot entirely substitute the interaction with the human banker, for which – as

evidenced by the result – local banking development still matters. The human ties between the bank and its customers still remain the core access channel to bank borrowing. Therefore, FinTech supports and accompanies the personal banking relationships rather than eliminate it. The findings are in line with those of Campbell and Frei (2010), according to whom internet banking increases the relevance of bank branches concentration, despite it mitigates personal relationships.

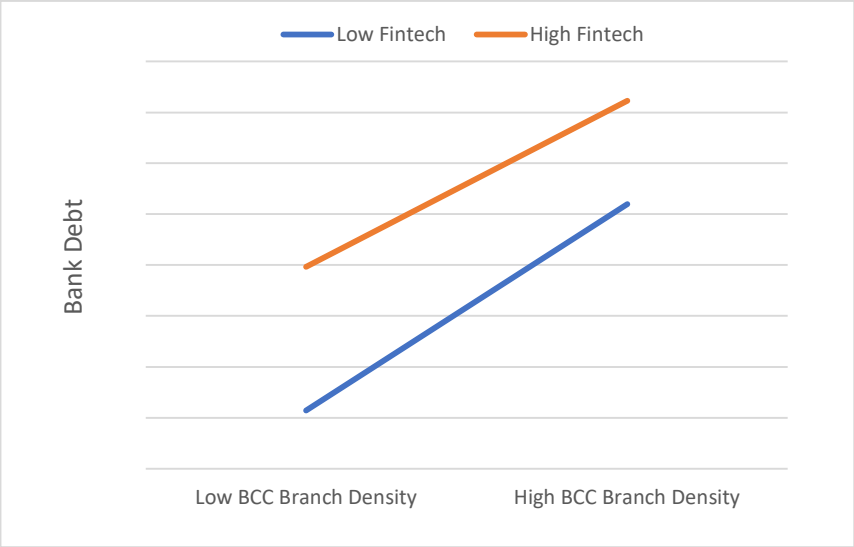
3.5.3 Local banking development and SMEs financial policies: the moderating role of FinTech for BCC bank branches

Table 6 investigates whether the effect of the geographical density of cooperative bank branches on SMEs use of debt and the moderating role of FinTech. The moderating interaction term is calculated as the variable BCC Branch Density multiplied by the variable FinTech.

*** Table 6 about here ***

Results of Table 6 indicate that when considering only cooperative banks branches, FinTech does not moderate the relationship between local banking development and debt, corroborating my hypothesis 2. This is interesting, but not surprising. Indeed, the findings confirm that cooperative banks that by nature operate locally, have a robust special close relationship with local entrepreneurs. This physical closeness reduces banks' need to acquire further information through FinTech channels. The existing strong relationship does not much need to be reinforced through hard information, as firms has already earned a solid reputation obtained via personal relationships. The following Figure 2 graphically shows that when the density of cooperative bank branches increases, the effect of the local financial sector on SME debt follows the same path both when FinTech is high and low. I confirms that the lending decisions of local banks are mainly based on soft information, supporting the findings of Howorth and Moro (2006).

Figure 2 - Marginal effect of local banking development on SMEs debt conditioned by FinTech for BCC bank branches



3.5.4 Robustness tests

As first robustness test I run in Table 7 the traditional ordinary least squares (OLS) method.

*** Table 7 about here ***

Results confirm that also when performing the OLS approach, the effect local financial institutions on SMEs debt is conditioned by FinTech. When firms use new FinTech channels, the relevance of local branches proximity is lower.

As second robustness test, I run the placebo test. My sample has a very high number of observations which could affect the statistical significance of the findings (Athey and Imbens 2017). To make sure that this number does not lead to false statistically significant results I applied a placebo test, in which 200 times I randomly assigned a Branch Density to each firm of the sample, and each time re-estimated the regression with the independent variable re-shuffled. I expect that in this setting Branch Density does not significantly influence SMEs' use of debt. When I run the placebo test 200 times, I find that the estimated coefficients of Branch Density are not statistically

significant at the 10% level in more than 90% of the cases[21]. Hence, the results of placebo tests confirm the robustness of my findings, which are thus not influenced by chance.

3.6 Conclusion and implications

FinTech is one of the technologies that is transforming the banking sector and has received a lot of attention from scholar and practitioners all over the world. FinTech allows banks to provide services more efficiently than in the past and to acquire a huge amount of information about firms. This revolution integrates the work of human bankers in the process of mitigating information asymmetry problems, such as adverse selection and moral hazard problems. Therefore, hard codifiable information provided by FinTech could change the role of the bank branches network in the future. In this context, the present chapter scrutinizes whether and to which extent FinTech moderates the effect of local banking development, measured in terms of bank branches density, on the amount of debt used by Italian SMEs. The findings, supported by robustness tests, suggest that both local banking development and FinTech have a positive effect on SMEs debt policies. However, the effect of local banking development decreases as the level of FinTech rises, suggesting that new financial technologies mitigate the influence of local banking institutions. It seems that when banks can obtain information from FinTech channels, the bank-entrepreneur personal relationship decreases its relevance. On the contrary, when firms use less internet banking channels, the proximity between the firm and the bank branches is more important. Nevertheless, my evidences indicate that bank branches concentration is still important even in a digital environment. Indeed, while internet banking provides standard quantifiable information about borrowers, human interactions allow to acquire 'soft' qualitative information that are at the core of the decision process. Therefore, despite FinTech is changing the bank-customer relationship, it is unlikely that digital technologies will replace personal contacts in the long-run. Differently, it is likely that FinTech and face-to-face connections will coexist. But how FinTech and

[21] The results of the 200 Placebo test regressions are available upon request.

personal relationship interact each other? Human bankers adapt their discretional decisions also on the basis of the quantitative information provided by FinTech. At the same time, FinTech should make huge steps forward. A further advance of FinTech could be the developments artificial intelligence techniques to better support loan officers' strategic and qualitative decisions. Technological research could lead to the use of FinTech in order to exploit machine learning techniques for applications that guide the banks not only towards the correct quantitative choices, but also providing support for strategic/qualitative decisions, with a consequent strong positive impact on the bank-firm relationship. This will create a unique new banking business model where digitalization represents an opportunity to reduce the discretion of decisions based on 'soft' information. This will also reduce errors in the loan assessment and, consequently, financial constraints. The hope is to further help the decisions of bankers without abolish the personal interface that is at the core of the banking relationship.

Moreover, the growth of FinTech generated turbulences in the banking markets. Governments should consider this trend and implement proper regulations that make FinTech an opportunity. Governments should regulate FinTech development in the right direction. In particular, FinTech should be used in order to reduce asymmetric information problems. Bankers should not use hard information as an obstacle to loan provisions. It is precisely when hard information suggests not to grant a loan that the personal close ties show their relevance. It is thus important that FinTech does not substitutes banks in their most important key functions, as close relationships in banking are still essentials and the importance the geographic distance is still important in lending decisions.

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Table 1 - Hypotheses and model.

Hypotheses	***Model***
H.1	*Debt = f* (Total Bank Branch Density, control variables), cluster(province) cluster(firm)
H.2	*Debt = f* (Cooperative Bank Branch Density, control variables), cluster(province) cluster(firm)

Table 2 – Variables descriptions.

Dependent variable	**Calculation**
Bank Debt	(Long-Term Bank Debt + Short-Term Bank Debt) / Total Assets
Explanatory variables	
Branch Density	(Total Bank Branches at provincial level × 1000) / Population at provincial level
BCC Branch Density	(Total Cooperative Bank Branches at provincial level × 1000) / Population at provincial level
FinTech	(Total number of bank customers using online and mobile internet banking services × 1000) / Population at provincial level
Cash Holdings	Cash & cash equivalents / total assets
ROA	EBIT / Total Assets
Working Capital	(Working Capital) / Total Assets
Size	ln(total assets)
Tangibility	Tangible Assets / Total Assets
Intangibles	Intangible Assets / Total Assets
Age	ln(Age)
Firm Growth	$(Sales_{t} - Sales_{t-1}) / Sales_{t-1}$
GDP Growth	$[(\text{real GDP at provincial level})_{t} - (\text{real GDP at provincial level})_{t-1}] / (\text{real GDP at provincial level})_{t-1}$
South	Dummy equal to one for firms based in the southern part of Italy

Table 3 - Descriptive Statistics for the sample.

	mean	sd	min	p25	Median	p75	max
Bank Debt	0.140	0.541	0.000	0.000	0.011	0.240	601.172
Total Branch Density	0.500	0.171	0.151	0.363	0.496	0.629	1.050
FinTech	0.519	0.180	0.078	0.389	0.518	0.641	1.164
Cash Holding	0.128	0.168	0.000	0.012	0.060	0.182	2.900
ROA	0.061	0.136	-0.527	0.015	0.047	0.104	0.537
Working Capital	0.265	0.404	-71.233	0.028	0.230	0.460	84.271
Size	6.758	1.549	2.141	5.722	6.744	7.804	10.314
Tangibility	0.238	0.253	0.000	0.043	0.144	0.362	5.494
Intangibles	0.035	0.084	0.000	0.000	0.004	0.027	1.345
Age	2.414	0.992	0.000	1.792	2.565	3.219	4.949
Firm Growth	0.722	3.557	-0.989	-0.188	0.004	0.314	28.135
GDP Growth	0.000	0.017	-0.175	0.000	0.000	0.000	0.213
South	0.234	0.424	0.000	0.000	0.000	0.000	1.000

Table 4 – Correlation matrix

		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
(1)	Bank Debt	1.00												
(2)	Total Branch Density	0.07	1.00											
(3)	FinTech	-0.01	0.39	1.00										
(4)	Cash Holding	-0.10	-0.07	-0.00	1.00									
(5)	ROA	-0.05	0.04	0.02	0.23	1.00								
(6)	Working Capital	0.03	0.07	-0.02	-0.20	-0.00	1.00							
(7)	Size	0.09	0.21	0.13	-0.25	-0.04	0.08	1.00						
(8)	Tangibility	0.08	0.08	-0.06	-0.23	-0.10	-0.21	0.21	1.00					
(9)	Intangibles	0.02	0.00	-0.00	-0.09	-0.10	-0.08	-0.06	-0.05	1.00				
(10)	Age	0.06	0.15	0.12	-0.11	-0.09	0.11	0.54	0.18	-0.10	1.00			
(11)	Firm Growth	0.02	0.04	-0.08	-0.02	0.04	0.01	0.07	-0.01	-0.00	-0.07	1.00		
(12)	GDP Growth	0.01	0.08	0.06	-0.03	-0.00	0.03	0.08	0.00	-0.00	0.12	0.17	1.00	
(13)	South	-0.04	-0.66	-0.62	0.04	-0.03	-0.04	-0.18	-0.01	-0.01	-0.16	0.00	-0.10	1.00

Notes: Industry dummies are not reported. Correlations different from 0.00 are statistically significant at the 0.01 level.

Table 5 Main Model - Local banking development and SMEs financial policies: The moderating role of FinTech.

Estimation technique:	(1) OLS Cluster	(2) OLS Cluster	(3) OLS Cluster	(4) OLS Cluster
Dependent Variable	Bank Debt	Bank Debt	Bank Debt	Bank Debt
Total Branch Density	0.099***		0.100***	0.154***
	(0.009)		(0.009)	(0.022)
FinTech		0.007**	-0.001	0.012**
		(0.003)	(0.002)	(0.005)
Total Branch Density * FinTech (interaction)				-0.024***
				(0.009)
Cash Holdings	-0.226***	-0.226***	-0.226***	-0.226***
	(0.024)	(0.031)	(0.024)	(0.024)
ROA	-0.098***	-0.095***	-0.098***	-0.098***
	(0.014)	(0.014)	(0.014)	(0.014)
Working Capital	0.009	0.010	0.009	0.009
	(0.021)	(0.026)	(0.021)	(0.021)
Size	0.016***	0.017***	0.016***	0.016***
	(0.002)	(0.002)	(0.002)	(0.002)
Tangibility	0.086***	0.089***	0.086***	0.086***
	(0.011)	(0.019)	(0.011)	(0.011)
Intangibles	0.119***	0.120***	0.119***	0.119***
	(0.014)	(0.022)	(0.014)	(0.014)
Age	0.008***	0.009***	0.008***	0.008***
	(0.003)	(0.003)	(0.003)	(0.003)
Firm Growth	0.039	0.038	0.038	0.038
	(0.001)	(0.001)	(0.001)	(0.001)
GDP Growth	-0.024	-0.034	-0.021	-0.025
	(0.052)	(0.049)	(0.052)	(0.051)
South	-0.001	-0.026***	-0.002***	0.002***
	(0.001)	(0.001)	(0.001)	(0.001)
Adj. R2	0.025	0.024	0.025	0.025
Observations	1,458,450	1,458,450	1,458,450	1,458,450

Notes: Industry and year fixed effects are the controls. The *p*-values in parentheses are based on standard errors clustered by provinces and firms. The superscripts denote significance as follows: $^{*}p< 0.10$, $^{**}p< 0.05$, $^{***}p< 0.01$. Standard errors in parentheses

Table 6 Local banking development and SMEs financial policies:

The moderating role of FinTech for BCC Bank Branches

Estimation technique:	(1) OLS Cluster	(2) OLS Cluster	(3) OLS Cluster	(4) OLS Cluster
Dependent Variable	Bank Debt	Bank Debt	Bank Debt	Bank Debt
BCC Branch Density	0.132***		0.129***	0.156***
	(0.004)		(0.003)	(0.011)
FinTech		0.007***	0.007***	0.007***
		(0.001)	(0.001)	(0.001)
BCC Branch Density * FinTech (interaction)				-0.013***
				(0.004)
Cash Holdings	-0.098***	-0.095***	-0.098***	-0.098***
	(0.014)	(0.014)	(0.014)	(0.014)
ROA	-0.226***	-0.226***	-0.226***	-0.226***
	(0.016)	(0.016)	(0.016)	(0.016)
Working Capital	0.009	0.010	0.009	0.009
	(0.021)	(0.021)	(0.021)	(0.021)
Size	0.017***	0.017***	0.017***	0.017***
	(0.002)	(0.002)	(0.002)	(0.002)
Tangibility	0.086***	0.089***	0.087***	0.087***
	(0.011)	(0.011)	(0.011)	(0.011)
Intangibles	0.121***	0.120***	0.120***	0.120***
	(0.011)	(0.011)	(0.011)	(0.011)
Age	0.009***	0.009***	0.009***	0.009***
	(0.003)	(0.003)	(0.003)	(0.003)
Firm Growth	0.040	0.039	0.041	0.040
	(0.001)	(0.002)	(0.001)	(0.001)
GDP Growth	-0.024	-0.034	-0.021	-0.025
	(0.052)	(0.049)	(0.052)	(0.051)
South	0.005	-0.034	-0.033	-0.034
	(0.033)	(0.040)	(0.040)	(0.040)
Adj. R2	0.024	0.024	0.024	0.024
Observations	1,458,450	1,458,450	1,458,450	1,458,450

Notes: Industry and year fixed effects are the controls. The *p*-values in parentheses are based on standard errors clustered by provinces and firms. The superscripts denote significance as follows: $^{*}p< 0.10$, $^{**}p< 0.05$, $^{***}p< 0.01$. Standard errors in parentheses

Table 7 - Local banking development and SMEs financial policies:

The moderating role of FinTech

Estimation technique:	(1) OLS	(2) OLS	(3) OLS	(4) OLS
Dependent Variable	Bank Debt	Bank Debt	Bank Debt	Bank Debt
Total Branch Density	0.099***		0.100***	0.142***
	(0.004)		(0.002)	(0.004)
FinTech		0.007***	-0.001	0.002*
		(0.001)	(0.001)	(0.001)
Total Branch Density * FinTech (interaction)				-0.064***
				(0.003)
Control Variables	Yes	Yes	Yes	Yes
Adj. R2	0.025	0.024	0.025	0.025
Observations	1,458,450	1,458,450	1,458,450	1,458,450

Notes: Industry and year fixed effects are the controls. The *p*-values in parentheses are based on standard errors clustered by provinces and firms. The superscripts denote significance as follows: $^{*}p< 0.10$, $^{**}p< 0.05$, $^{***}p< 0.01$. Standard errors in parentheses

Chapter 4

National versus Local Banking Development. Who is the Winner? A European within-country empirical analysis

Abstract

This chapter contributes to the financial literature by investigating the role of local banking development for SME financial policies in a cross-country European context, studying whether the financial policies of European SMEs are mainly driven from local or national banking development. Using a unique wide sample from 6 European countries, I find that higher levels of local banking development increase the amount of debt, cash holdings and trade credit used by SMEs. The results, supported by several robustness tests, suggest that both the local and the national banking institutions have a key role on SME financial decisions. However, the development of the banking markets at the national level shapes the influence of local banks on SME financial behaviour. Consequently, the European Commission and the Governments of the European Union should foremost improve the national banking institutions in order to reduce the financial constraints of SMEs and spur their economic growth.

Keywords: local banking development, national banking development, bank, financial constraints, SMEs

4.1 Introduction

The role of the financial institutions on firm policies is one of the most important topics in corporate finance. Noteworthy authors found that the development of the financial system[22] at the national level has a crucial impact on corporate growth processes (Demirguc-Kunt and Maksimovic, 1998; Levine, 2002; Allen and Gale, 2000; Rajan and Zingales, 2001). These authoritative works generated much academic interest in this field, attracting the attention of the researchers all over the world. This resulted in a rapid increase of papers that investigated how financial institutions influence firm value in several respects. In this context, an important aspect studied by the extant literature is the role of local banking development on corporate growth (Guiso et al., 2004; Kendall, 2012). The pioneer paper in this field is the worthwhile work of Guiso et al. (2004), which has been enormously influential and set the direction for the subsequent researches. Thanks to this contribution, it turned out that despite contemporary globalisation local banking development significantly matters for firm growth. Moreover, the authors interestingly observed that the development of local banking markets matters only for Small and Medium-sized Enterprises (SMEs), which face more asymmetric information problems in debt contract negotiations (Berger and Udell 1998). Indeed, SMEs information opacity makes that such firms strongly rely on the development of the local banking system, which can alleviate their financial constraint problems (Pollard, 2003; Beck et al., 2005; Alessandrini et al., 2009). This is because the proximity between the SME and the outside lenders mitigates asymmetric information difficulties, as evidenced by Petersen and Rajan (2002). This is remarkable, since the access to finance is one of the most pressing problems after the financial crisis, as evidenced by the European Central Bank[23], and is particularly essential in the recent context of coronavirus (COVID-19) crisis. Therefore, local banking development might reduce the obstacles to the funding of SMEs, which have a main role in the economic growth as they represent 99% of businesses in the

22 Financial system is intended as the set of instruments, institutions and mechanisms that ensure the transfer of financial resources from surplus to deficit subjects (financial resources allocation function).
23 European Central Bank, Economic Bulletin, Issue 4/2020, article "Access to finance for small and medium-sized enterprises since the financial crisis: evidence from survey data" Prepared by Katarzyna Bańkowska, Annalisa Ferrando and Juan Angel Garcia. Available at https://www.ecb.europa.eu/pub/economic-bulletin/articles/2020/html/ecb.ebart202004_02~80dcc6a564.en.html#toc1

European Union[24]. Consequently, given the importance of SMEs and starting from the aforementioned contributions that have gone down in the financial literature history, a flourishing stream of research focused on the relationship between local banking development and corporate financial decisions of SMEs. With this regard, some works studied how well-functioning financial markets influence the use of debt (Palacín-Sánchez and Di Pietro, 2016; La Rocca et al., 2010; González and González, 2008; Utrero-González, 2007) or trade credit (Deloof and La Rocca, 2015). These articles highlight that the development of local banking institutions enhances the use of both debt and trade credit. However, the latter and all the other works inspired by the paper of Guiso et al. (2004), investigated the effects of local banking development in a single country setting of analysis, which rises the issue of generalizability of results.

In this chapter , I provide a contribution to this body of literature, studying the effect of local banking development on corporate financial policies using a unique large dataset composed of SMEs from 6 different European countries. Differently from previous studies, I carry out a cross-country analysis to find out whether local banking development influences debt, cash holdings and trade credit decisions of SMEs.

In addition to that, in the light of the increasing globalization of financial markets, my work provides another important novelty that consists in studying for the first time whether SMEs rely more on the banking development at the national or at the local level. Despite the extant literature suggests that both local and national banking systems are important, no study has yet investigated which of the two systems better drives SME financial policies. This interesting aspect is particularly relevant as the different influence of one or the other banking system has crucial implications for both SMEs and policy-makers.

The results show that local banking development significantly and positively affects debt, cash holdings and trade credit decisions of European small businesses. SMEs set in local environments with more developed banking institutions use more external debt, keep higher levels of cash holdings and provide more trade credit to their customers. Moreover, the findings suggest that the development of national banking markets conditions the effect of local ones on SME financial decisions. It seems that

[24] https://ec.europa.eu/growth/smes/sme-definition_en

when the national banking setting is more developed, the relevance of local banking institutions is lower. *Vice versa*, when the national banking sector is less developed, the importance of local banking markets is greater. The implications of this research are crucial. First, in line with the findings of previous single-country studies, it confirms at the European level that local banking development matters for value creation processes of SMEs. Consequently, the government should carefully consider the development of the banking markets in order to spur SME growth. Second, my findings give an extraordinary importance to the actions of the European Governments, which should primarily improve the national channels of funding in order to mitigate SME financial constraints problems.

The remainder of the chapter is structured as follows. Section 2 describes the main literature and the research hypotheses. Section 3 explains data, methodology, and variables, while Section 4 shows the descriptive statistics and correlations. Section 5 illustrates results, further tests and robustness tests. The chapter ends with conclusions and implications in Section 6.

4.2 Literature Review and hypotheses development

4.2.1 Local banking development and SMEs financial policies

There is broad consensus in the extant literature that debt, cash holdings and trade credit represent three fundamental dimensions that play a significant role in shaping firm financial policies. While the importance of debt has been formerly studied starting from noteworthy and ancient contributions (see the review of Harris and Raviv, 1991), a relatively new stream of research investigate the role of cash holdings and trade credit. Most of empirical studies consider cash holdings as a substitute of debt, suggesting that it represents two faces of the same coin (e.g. Opler et al., 1999). Although there exists a substitution effect, in some circumstances (e.g. scarce creditor protection) indebted firms keep substantial cash reserves to prevent financial distress and maintain their financial flexibility (Guney et al., 2007). However, it is undeniable that debt financing is more difficult to obtain when asymmetric information between borrowers and lenders is relevant. As a result, cash holdings are more important for those firms that are financially constrained (Acharya et al., 2007; Faulkner and Wang, 2006). This is the case of SMEs that are typically financially constrained firms, as they

face asymmetric information problems and have high lending costs (Berger and Udell 1998). In this context, a strong tool that could mitigate SME financial restrictions and prevent from bankruptcy is the development of the banking system (Demirguc-Kunt and Maksimovic, 1998; Pollard, 2003; Beck et al., 2005; Arcuri and Levratto, 2020). These works suggest that SMEs seeking external funding are particularly influenced by the quality of the banking system in which they are embedded. More in detail, SMEs in countries with well-developed banking markets are more likely to obtain external financing than SMEs in countries with lower levels of banking development.

The above-reviewed contributions interestingly highlight the relevance of credit institutions for corporate financial policies. However, they investigate the role of banking development at the country level, ignoring that also at the local level there are different degrees of banking development (Guiso et al., 2004) that could affect SME finance decisions (Pollard, 2003). Inspired by such arguments, a novel and attractive line of study has started investigating how local banking development affects firm financial behavior. In this stream of research, Alessandrini et al. (2009), based on the Italian context, reveal that the physical distance between the firm and its financier obstacles credit provision, especially for small firms. A year later, La Rocca et al. (2010) carried out an empirical analysis using the same Italian context. In this work, the authors point out that higher levels of provincial banking development in terms of bank branch concentration increase the use of debt by SMEs. The same results are observed in Spain, where exactly as in Italy the differences in the level of debt of SMEs lie in the differences in the local banking institutions (Palacín-Sánchez and Di Pietro, 2016; González and González, 2008; Utrero-González, 2007).

These findings demonstrate that more developed banking markets facilitate the acquisition of 'soft' information on small entrepreneurs (Howorth and Moro 2006), reducing information asymmetries between the bank and the SME. Consequently, SMEs that have an easier access to external funds report higher levels of indebtedness. Building upon these arguments, I hypothesize that also in a cross-country context the proximity between the SME and the banking institution could increase the access to debt financing, for which I expect a positive effect of local banking development on debt (*Hypothesis 1*):

H.1 – Local banking development has a positive effect on European SME use of debt.

Cash holdings is often a substantial part of a firm assets (Dittmar and Mahrt-Smith, 2007; Bigelli and Sánchez-Vidal, 2011) and has a key role on corporate financial decisions. Bates et al. (2009) highlight four motives that explain why firms hold cash: the agency motive, the transaction motive, the precautionary motive, and the tax motive. The importance of cash holdings stimulated scholars to examine how the institutional finance environment affects cash policies (Holmstrom and Tirole, 1998, 2000; Pinkowitz and Williamson, 2001; Ferreira and Vilela, 2004; Ozkan and Ozkan, 2004; Khurana et al., 2006; Wu and Rui, 2016). Nevertheless, little attention has been paid to the relationship between local banking development and corporate cash holdings. The work of Han et al. (2017) provides insights in this direction, asserting that banking market concentration reduces the amount of cash held by small firms. Also Cowling et al. (2020) recently deal with this issue, studying liquidity problems in the light of regional differences in the UK. However, the scarce literature in this field is surprising, since it can be expected that local banking development will have a significant impact not only on debt provisions of SMEs, as evidenced by La Rocca et al. (2010), but also on cash holdings. However, what is the expected effect of such relationship?

The above mentioned literature does not provide *a priori* a clear direction of such effect. Indeed, on the one hand, Holmstrom and Tirole (1998, 2000), and Khurana et al. (2006) suggest that the presence of underdeveloped banking systems leads SMEs to save a buffer of cash to preserve growth opportunities and maintain their financial flexibility in the event of adverse contingencies. Hence, as evidenced by the precautionary perspective (Lins et al., 2010), firms build up cash reserves to cover their investments if negative and unexpected contingencies impede the access to the capital markets. This, in turn, implies that firms hold less cash when a close bank relationship boosts them to raise external finance, as underlined by Ferreira and Vilela (2004), Ozkan and Ozkan (2004).

On the other hand, some works observe a positive effect of banking development on corporate cash holdings (Pinkowitz and Williamson, 2001; Dittmar et al., 2003; Wu and Rui, 2016). Pinkowitz and Williamson (2001), focusing on Japanese companies, reveal that more powerful banks encourage firms to hold more cash. The reason for this is that bank face agency costs, for which higher levels of cash allow banks to reduce their screening and monitoring costs. In line with these findings, also Dittmar et al. (2003) support the agency view, showing that an easier access to external finance stimulates firms to increase cash holdings. Moreover, according to Wu and Rui (2016), a better access to external finance allows firm to hold more cash.

In the light of the prior controversial findings, the effect of banking development on cash holdings is *a priori* not clear and requires further investigation. The dichotomous empirical evidences of the existing literature can be explained according to which of the four above mentioned reasons for holding cash prevails over the others. With this regard, I intend to deepen and enrich this debated topic through a study that involves a complete sample of European SMEs from different countries. Although previous contributions do not provide a unique direction of the relationship between local banking development and cash holdings, I expect that a close relationship between the firm and its lenders reduces the need to hold precautionary cash. Consequently, where the financial system supports the access to external debt, I hypothesize that SMEs save lower levels of cash holdings (*Hypothesis 2*):

H.2 – Local banking development has a negative effect on European SME use of cash holdings.

Finally, trade credit represents an important dimension of corporate financial policies. The financial literature provides three main theories to explain why firms use trade credit: the financial motive (Emery, 1984), the operational motive (Emery, 1987) and the commercial motive (Brennan et al., 1988). Trade credit acts as a source of funding alternative or complementary to debt (McGuinness and Hogan, 2014) and cash holdings (Wu et al., 2011). With this regard, Carbó-Valverde et al., (2012), and McGuinness and Hogan (2014) point out that the substitution effect between bank debt

and trade credit makes the latter essential for financially constrained SMEs, especially during crisis periods. The authors assert that large firms, which are less sensitive to the imperfections in the local financial markets, employ trade credit to redistribute financial funds to informationally opaque SMEs. These discoveries confirm that where the access to external funding is restricted, financially stronger firms redistribute capital via trade credit to their more financially constrained customers (Fisman and Love, 2003; Love et al., 2007; Cull et al., 2009). A separate stream of research investigates the key role of the financial institutions on the relationship between cash holdings and trade credit. For instance, Wu et al., (2011) suggest that where the financial markets are more developed, trade credit is used as an alternative source of short-term financing.

Regarding the role of banking development on trade credit policies, the former work of Petersen and Rajan (1997) highlights that trade credit is particularly important for SMEs in those less developed financial contexts where the access to external finance is more difficult. In a similar vein, Demirgüç-Kunt and Maksimovic (2001) find that in countries with larger national banking systems firms use more trade credit. Within this strand of literature, Deloof and La Rocca (2015) study for the first time the relationship between banking development and corporate financial policies in a local context of analysis, i.e. Italy. The two authors highlight that the higher the development of local banking markets the higher the trade credit used by SMEs. Consequently, firms operating in more developed banking environments provide more trade credit to their customers. Their contribution corroborates the former findings suggesting that the trade credit policies are strongly influenced by the banking institutions, but they focus on a single country setting. Moving to a larger European context, the arguments of Deloof and La Rocca (2015) lead me to expect that SMEs operating where the banking institutions are strongly developed use more trade credit. Therefore, in order to provide a more comprehensive framework in this literally context, this study aims to generalize the previous empirical results by hypothesizing that in the European context (*Hypothesis 3*):

H.3 – Local banking development has a positive effect on European SME use of trade credit.

4.2.2 The moderating effect of national on local banking development

The above arguments that led to the development of the first three research hypotheses highlight how firms financial decisions are determined by factors that are related to the local banking environment. A parallel and antecedent core literature suggests that also the national banking development has a key role on corporate financial policies. Noteworthy contributions focus on this field of research, which is a "hot topic" in the financial studies. For instance, Mayer (1990) and Rajan and Zingales (1998, 2001) find that higher levels of financial development reduce the cost of external finance. Chittenden et al. (1996), focusing on SMEs, point out that the access to capital markets is an important determinant of debt choices. Likewise, Demirguc-Kunt and Maksimovic (1998) argue that the development of the financial markets increases the availability of debt, especially of longer maturity. Later, Giannetti (2003) suggests that debt ratios are influenced by the degree of the financial market development, while Utrero-Gonzàlez (2007) observe that prudential banking regulation enhances the probability of firms to obtain credit resources. Therefore, all these empirical evidences underline that well-performing national banking markets facilitate the access to external credit, as the efficiency of the banking system mitigates problems of asymmetric information.

However, the former contributions investigate the role of the banking systems focusing on the national scale. In a different way, the literature reviewed in the preceding sub-paragraph 2.1 highlights that also at the local level banking development has an important effect on corporate financial policies. It is thus clear that two streams of research coexist: one studying local banking markets, while the other studying national banking markets. Nevertheless, although the access to the capital markets is a major concern for SMEs in any country, previous contributions do not shed light on a critical issue still unresolved: is there a relationship between such two effects? Does the big (national banking development) moderates the small (local banking development)? In the face of the discussion in the financial research, the questions naturally arises. From one side, one could expect that the totality of the provincial banking developments

builds up the degree of national banking development (bottom-up effect). Consequently, SMEs in need of financial resources would rely more on the local banking system. However, from another perspective, the whole national banking development could drive the development of the underlying local banking institutions (up-bottom effect). Thus, national banking development would be more relevant than the local one. This works aims to respond for the first time to this intriguing gap of knowledge. What is sure is that the state of development of the financial sector depends from the overlying governmental policies. Such national development is supposed to affect the local (provincial) development that is at a lower level. Indeed, despite the presence of significant differences across provinces (Utrero-González, 2007; Guiso et al., 2004), the local banking development of European provinces is still likely to be a byproduct of the performance of national banking institutions. This because provinces represent a sub-national level under the same institutional conditions (e.g. banking regulation, legislation, etcetera) and, more in general, below the same macro-environment. This suggests that the national banking development moderates the effect of local banking development on corporate financial strategies of SMEs, and not *vice versa*. Therefore, on the basis of this reasoning, I expect that

H.4 – National banking development moderates the effect of local banking development on European SME financial policies.

4.3 Research design: data, methodology, and variables

4.3.1 Data

The study is based on a sample of non-financial SMEs from 6 European countries: Finland, France, Germany, Italy, Spain and United Kingdom. It is important to notice that the sample contains bank-based economies and also one market-based economy (i.e. UK). SMEs are selected according the European Commission definition[25] in terms

[25] EUR-LEX: 2003/361/EC: Commission Recommendation of 6 May 2003 concerning the definition of micro, small and medium sized enterprises, Official Journal of the European Union L124/36, 20.5.2003, p. 36–41.

of employees (fewer than 250 persons), annual turnover (lower than EUR 50 million) and/or annual balance sheet total (not exceeding EUR 43 million). My dataset is derived from several sources. Firm-specific data are collected from the Amadeus database of Orbis Bureau Van Dijk, containing balance sheets of private and public companies across Europe. Orbis has the most extensive database of financial and business information for SMEs all over the world. Moreover, using NACE codes[26] it harmonizes the financial accounts to allow for accurate comparison of firms across countries. Additionally, data concerning local banking development are collected from the banks of the single European countries[27]. The Banks provide information about the density of bank branches per province, corresponding to the NUTS3 areas in the EU classification according to the statistical office of the European Union (Eurostat dataset). I use bank branch density as measure of local banking development because, despite the proliferation on fintech that reduces asymmetric information (Cappa et al. 2020), bank debt still remains the most used source to finance fixed assets investments in Europe[28]. Moreover, the database "World Development Indicators" provided by the World Bank makes available my measure of national banking development. Finally, data regarding enforcement, domestic product (GDP) and population at the provincial level come from the national statistical institutes of the single European countries[29].

Furthermore, I imposed restrictions on the data as follows. First, I selected only firms with accounting information over the sample period and I excluded economically meaningless observations with respect to accounting information. Then, I limited the impact of the outliers, winsorizing all the control variables at the first and 99th percentiles. Lastly, observations with errors (e.g. non-positive values for total book

[26] NACE is the European statistical classification of economic activities. NACE groups organizations according to their business activities. Statistics produced on the basis of NACE are comparable at European level.

[27] Suomen Pankki (Finland), Banque de France (France), Deutsche Bundesbank (Germany), Banca d'Italia (Italy), Banco de Espana (Spain), Bank of England (United Kingdom).

[28] European Central Bank, Economic Bulletin, Issue 4/2020, article "Access to finance for small and medium-sized enterprises since the financial crisis: evidence from survey data" Prepared by Katarzyna Bańkowska, Annalisa Ferrando and Juan Angel Garcia. Available at https://www.ecb.europa.eu/pub/economic-bulletin/articles/2020/html/ecb.ebart202004_02~80dcc6a564.en.html#toc1

[29] Statistics Finland and Courts of Appeal (Finland), INSEE (France), Federal Statistical Office Germany (Germany), ISTAT (Italy), INE and Consejo General del Poder Judicial (Spain), Office for National Statistics (United Kingdom).

assets) and zero sales were removed. To sum up, I build an unbalanced panel set of 285,974 firm-year observations over the period 2004-2010.

4.3.2 Methodology

Following the approach of Deloof and La Rocca (2015), I investigate my hypotheses first using the ordinary least squares based on clustered standard errors (OLS cluster) in order to account for multiple dimensions at the same time[30]. This approach is important because it allows controlling for observations that are correlated under two dimensions (country and province). Hence, regressions correct the standard errors for the possible dependence of the residuals within clusters, as they consider that the variables measuring local and national banking development vary at the provincial and at the national level, respectively. Then, I perform additional tests in search of robustness of my findings. As first robustness analysis, I employ the traditional ordinary least squares (OLS) technique using standardized coefficients, so that the variances of dependent and independent variables are equal to 1. This approach indicates which of the differently calculated variables measuring local and national banking development has a greater effect on the dependent variables that measure SME financial policies. As additional robustness exam, I perform the structural equation models (SEMs) technique using the maximum likelihood method with robust standard errors. This empirical test allows for a very accurate estimation of standardized parameters. Finally, I applied a Placebo test to make sure that the high number of observations does not lead to false statistically significant results. Table 1 synthesizes hypotheses and model.

*** Table 1 about here ***

4.3.3 Variables definition

[30] I used the Mitchell Petersen's Stata routine to cluster standard errors by two dimensions (available at https://www.kellogg.northwestern.edu/faculty/petersen/htm/papers/se/se_programming.htm)

This study uses three dependent variables measuring SME financial policies. First, *Debt* is a proxy for the amount of bank debt used by SMEs. Following the capital structure literature (e.g., Rajan & Zingales, 1995), the financial level of indebtedness is calculated by the ratio of long-term and short-term interest-bearing bank debt scaled by total assets. As second dependent variable, I employ *Cash Holdings* that is the ratio between cash and cash equivalents scaled by total assets (e.g., Almeida et. al. 2004; Ozkan and Ozkan 2004). For my final dependent variable, I calculate *Trade Credit* as receivables minus payables over total assets (e.g., Deloof and La Rocca, 2015). This variable shows the net investment of SME in trade credit.

As first independent variable, following the approach of Guiso et al. (2004), Benfratello et al. (2008), Alessandrini et al. (2009), La Rocca et al. (2010), and others, I measure *Local Banking Development* considering the number of national bank branches scaled to 1,000 inhabitants in the province. This variable is widely used in the previous studies as it clearly explains the dimension of the banking development at the local level. Differently, *National Banking Development* is calculated, according to the World Bank approach, as the total domestic credit[31] provided by the financial sector to the private sector by banks as a percentage of GDP. This measure represents a standard proxy of banking development in the financial literature using panel data (e.g., Clarke et al. 2006; Nikoloski 2012) and measures the extent with which households and firms easily get external credit. Table 2 synthetize the variables description.

*** Table 2 about here ***

I also include a number of firm-specific variables that may influence the effects studied. *ROA* is a variable broadly used in the financial literature to measure SME performance. It is calculated as earnings before interest and taxes (EBIT) scaled by total assets. I use an accounting-based measure in reliance on the fact that no information about the market value of small businesses is available. Firms that are more profitable are likely to have a proactive approach versus financial strategies. *Size* is measured as the logarithm of total assets. Larger firms typically have a bargaining

[31] With the exception of credit to the central government.

power with their lenders or suppliers. *Tangibility* is the ratio of tangible fixed assets to total assets. Tangible assets may increase firms financial capacity as they are used as collateral. *Age* is calculated as year minus year of incorporation. Older firms have a long history that reduces information asymmetries and facilitates credit provision. *Different Tax Shield* is calculated as earnings before interest, taxes, depreciation and amortization minus earnings before interest and taxes (EBITDA - EBIT) scaled by total assets. This variable is particularly important to control for the different tax regimes of the European countries. *Firm Growth* is measured as sales in year (t) minus sales in year (t-1). Growing SMEs generally require more financial resources (Binks and Ennew 1997). I also control for provincial characteristics that may affect the results. *GDP Growth* is measured as the growth in real GDP at the provincial level from year (t-1) to year (t). *Enforcement* represents the time required to enforce a right and takes into account the efficiency of the law courts at the local level. Industry and year fixed effects using dummies are also included in the econometric model.

4.4 Descriptive statistics and correlations

Table 3 shows the descriptive statistics for the variables. It presents mean, standard deviation, minimum value, 25th, 50th (median), 75th percentiles and maximum value for all the variables.

*** Table 3 about here ***

Descriptive Statistics show that my dependent variables play a very important role in the financing of European SMEs. In particular, on average debt represents 20.2% of total assets, cash constitutes 9.7% of total assets and net trade credit investments comprise 12.7% of total asset. Moreover, the standard deviation of *Debt* (0.197), *Cash Holdings* (0.131) and *Trade Credit* (0.206) indicates a large variability of the dependent variables across the SMEs in my sample. Table 3 shows that there is substantial variation also with respect to both local and national banking development,

while the values for the control variables are in line with the existing financial literature studies.

Additionally I report descriptive statistics of the variables *Debt*, *Cash Holdings* and *Trade Credit* for high and low levels of both local and national banking development based on median[32]. Results, which are shown in Table A.1 and Table A.2 in the appendix, interestingly reveal that higher levels of both local and national banking development increase the use of debt, cash holdings and trade credit. This demonstrates that different degrees of the independent variables influence the financial policies of SMEs. Furthermore, I show (in Figure A.1 in the appendix) the trend of the *Debt*, *Cash Holdings* and *Trade Credit* during the years, observing a mostly stable trend throughout the period examined.

Table 4 reports the correlation matrix of the variables.

*** Table 4 about here ***

All the correlations different from 0.00 are statistically significant at the 0.01 level. Additionally, I tested possible multicollinearity among the independent variables by using the variance inflation factors (VIFs) that estimate how much the variance in the regression coefficients is inflated due to multicollinearity. The maximum VIF in the model is 2.63 (mean of 1.40) that is far below the generally accepted cutoff of 10 (or, more prudently, 5) for regression models. Therefore, no bias was detected in the significance of the results.

4.5 Empirical results

4.5.1 Local banking development and SMEs financial strategies

Table 5 shows the results of the study with standard errors clustered at the provincial and country level. The effect of local and national banking development is reported using separate regressions for debt (columns 1, 2 and 3), cash holdings (columns 4, 5

[32] We also observed the differences based on the 25th and 75th percentiles, obtaining the same results.

and 6) and trade credit (columns 7, 8 and 9). The p-values are based on heteroscedastic robust standard errors.

*** Table 5 about here ***

The main results are easily summarized. It is immediately possible to notice that both local and national banking development significantly affect my 3 measures of financial policies. However, while local banking development has a positive effect on debt (column 1) and trade credit (column 7), confirming my hypotheses 1 and 3, it seems that the development of local banking markets also has a positive effect on cash holdings (column 4), which is inconsistent with hypothesis 2. I discuss now the findings obtained for each single hypothesis.

Regarding my first dimension of SME financial policies, the results support the argument that the close proximity between SME and provincial bank branches stimulates credit provision in the European countries. Therefore, the banking development of the geographical area where a SME resides increases the availability of financial resources, since bank branches can easily obtain deep information and reduce information asymmetries. Additionally, the negative coefficient of the variable *Cash Holdings* (in columns 1) and the negative coefficient of the variable *Debt* (in columns 4) confirm that European SMEs use financial borrowing as a substitute for cash. The findings corroborate those of Alessandrini et al. (2009) and La Rocca et al. (2010). However, differently from previous contributions, I find for the first time that this positive important effect exists not only in a single country, but at the European level too.

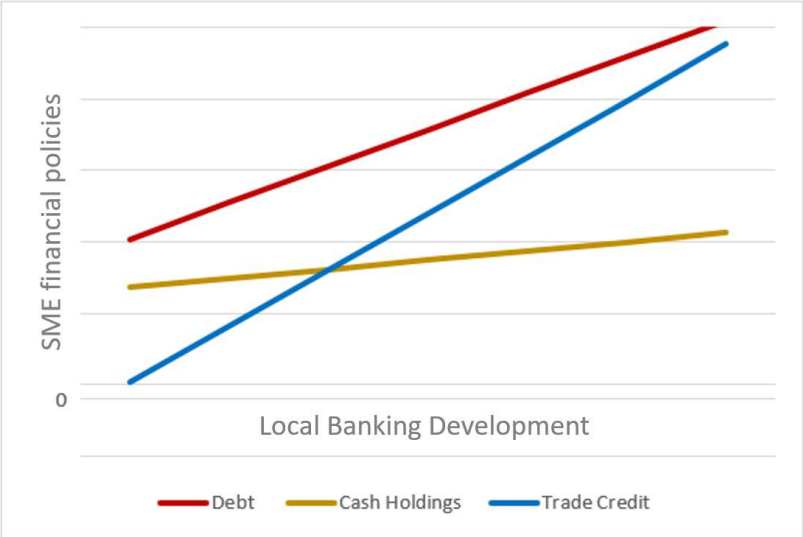
Concerning my second hypothesis, results shed new light on the controversial findings of the existing literature. In particular, my empirical evidence reveals a positive effect of local banking development on European SME cash holdings. These findings are in line with those of Pinkowitz and Williamson (2001), Dittmar et al. (2003) and Wu and Rui (2016), supporting the agency view. However, they are not consistent with the findings of Holmstrom and Tirole (1998, 2000), and Khurana et al. (2006), Ferreira

and Vilela (2004), and Ozkan and Ozkan (2004), supporting the precautionary perspective. Thus, the empirical evidences reveal that when local banking institutions ensure an easier access to external funds, European SMEs increase their cash holdings. As a result, in the wide European context, cash holdings policies of SMEs seem to be driven by the agency perspective more than the precautionary motive. Hence, despite more developed banking institutions should alleviate asymmetric information difficulties and favor the use of debt, which is a substitute of cash, the presence of agency costs and the need to maintain the financial flexibility induces managers of European SMEs to hold higher levels of liquidity.

Finally, results highlight that the development of the banking sector has a positive impact on the trade credit policies of European SMEs, confirming my third hypothesis. The availability of financial credit in a geographical area encourages suppliers to provide commercial credit to their customers. Hence, financially constrained SMEs indirectly benefit from the greater accessibility of 'soft' information available in more developed financial provinces. Therefore, consistent with the findings Deloof and La Rocca (2015), I suggest that the development of the banking system facilitates the provision of trade credit, resulting in larger net investments in trade credit. However, the present study, differently from those of Deloof and La Rocca (2015), focuses on a cross-country setting and provides more generalizable results.

The evidences observed in Table 5 are also demonstrated through the following Figure 1 extract from regressions. Figure 1 interestingly shows that the positive effects of well-developed banking markets on corporate financial policies of SMEs increases with higher levels of local banking development.

Figure 1 Regression results: trend of debt, cash holdings and trade credit affected by different levels of local banking development



To sum up, I find that local banking development matters in the European countries even in a globalized world. The empirical results interestingly allow to generalize for the first time the noteworthy findings of Guiso et. al. (2004) and others single-country studies.

4.5.2 The moderating effect of national on local banking development

Turning to the second question of the chapter, this paragraph investigates through a moderation analysis whether the financial policies of SMEs are more influenced by the local or the national banking development. Table 6 shows the regressions concerning the main model also including the interaction term that is my moderating variable based on the variable *Local Banking Development* multiplied by the variable *National Banking Development.* An F-test supports the hypothesis regarding the joint significance of *Local Banking Development* and its interaction term.

*** Table 6 about here ***

Table 6 estimates the marginal impact of local banking development for different levels of national banking development, in order to scrutinize whether the effect of local markets is different in magnitude according to different levels of national

development. To calculate the interaction effects between two continuous variables it is indispensable to consider a graph, since the regression coefficients do not provide a correct interpretation of the marginal effect studied. Differently, a graph clearly shows the partial effect of local banking markets on SME financial policies conditional for high or low levels of national banking development. Therefore, for a better understanding of the results, the marginal effect of local banking development on debt, cash holdings and trade credit, conditioned by national banking development is graphically shown in the following Figures 2–4[33].

Figure 2 - Marginal effect of local banking development (LBD) on debt conditioned by national banking development

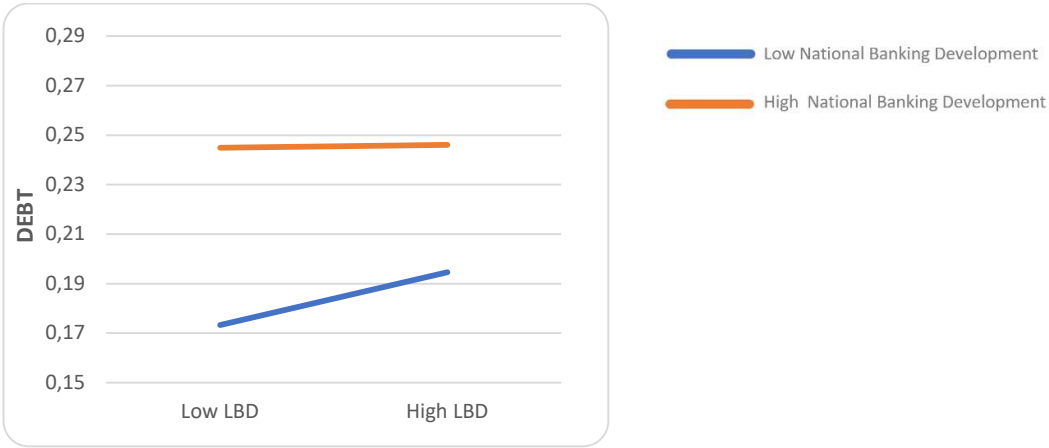


Figure 3 - Marginal effect of local banking development (LBD) on cash holding conditioned by national banking development

[33] Figures 2-4 are based on the Jeremy-Dawson graphs. For further information, see www.jeremydawson.co.uk/slopes.htm.

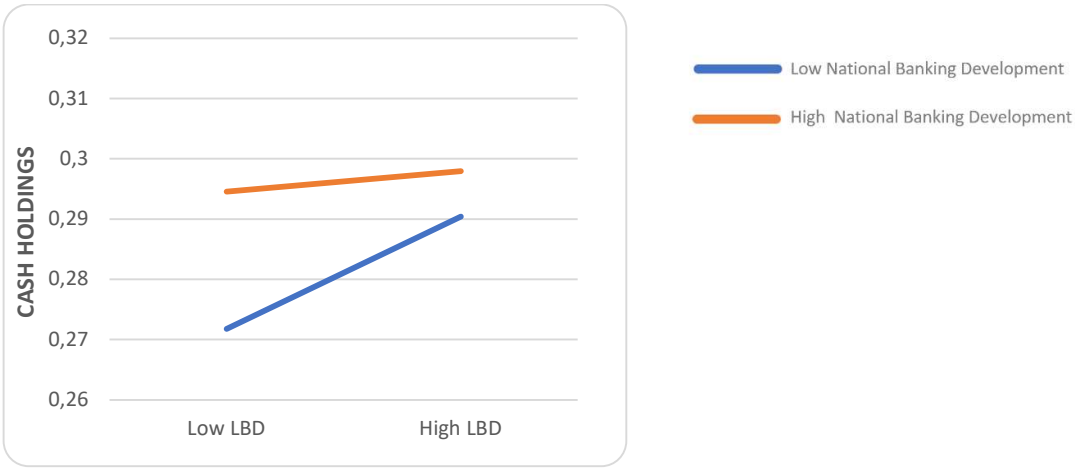


Figure 4 - Marginal effect of local banking development (LBD) on trade credit conditioned by national banking development

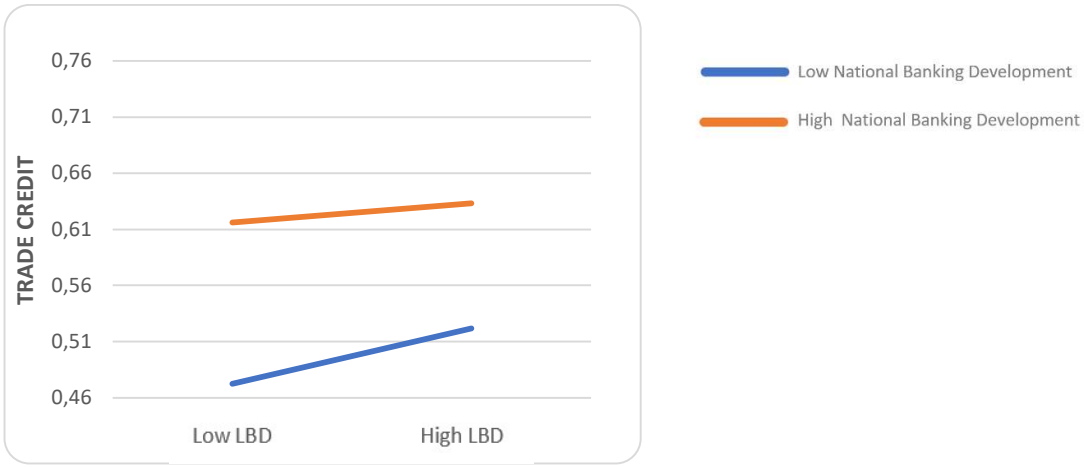


Table 6 and Figures 2-4 evidence that the role of local banking institutions on SME financial decisions is different in magnitude according to different levels of national banking development. In particular, the interaction term, which I measure at the 95% confidence interval in regressions, is negative and statistically significant, indicating

that the positive effect of local banking development on SME financial policies tends to decrease as the level of national banking development rises. Therefore, national banking markets moderates the effect of local ones on the financial decisions of European SMEs and my fourth hypothesis is confirmed. These findings answer an important and unresolved question: SME financial policies are more conditioned by local or national banking development? This chapter demonstrates that the national banking development reduces the effect of local banking institutions on SME debt, cash and trade credit choices. It seems that when national banking systems are more developed, the role of local markets is lower. Thus, well-functioning credit markets at the national scale reduce the relevance of local contexts. This result was observable also in Table 5 where in columns 3, 6 and 9 the standardized coefficients of the variable *National Banking Development* are higher than the standardized coefficients of the variable *Local Banking Development*. Therefore, the national banking markets drive European SME financial behaviour more than the local ones. It seems that the regulation of the banking institutions at the country level, together with the growth of globalization and integration of financial markets, make the national banking markets more influential than the local ones. However, this does not imply that the local context does not matter anymore, but it indicates that the financial policies of European SMEs are more favoured by the development of the national banking sector. Consequently, local banking markets remain still relevant, but to a lesser extent with respect to the national ones. Thus, answering the question which arises in the title of the present chapter, it is possible to conclude that the national banking markets win over the local ones.

4.5.3 Further and robustness tests

Further test

Following previous studies on corporate debt policies that drawn the attention to debt-maturity structure (Fan et al., 2012) also for SMEs (La Rocca et al., 2010; Hernandez-Canovas and Koeter-Kant, 2008), I run a further test distinguishing between long and short term bank debt. The following Table 7 reports the corresponding output.

*** Table 7 about here ***

Table 7 shows a very interesting result. Both local and national banking development seem to have no relevance on short-term bank debt ratios, while they significantly and positively impact on the use of long-term bank debt by SMEs. This is relevant, but not surprising. Indeed, as evidenced by the articles of Diamond (1991) and Barclay and Smith (1995), which represent two fundamental contributions in the financial literature, banks react to the underdevelopment of the financial markets by reducing the maturity of their loans. Shorter loans allow banks to frequently monitor SME and interrupt the bank-lending relationship if the firm becomes poor creditor. Differently, a longer loan maturity could cause greater losses in the event of insolvency. Therefore, where the banking systems (both local and national) are more developed and asymmetric information is limited, banks tend to increase debt-maturity. Consequently, the development of local and national banking sectors is a matter of importance only for long-term bank debt choices.

Robustness test: ordinary least square

As first robustness I run in Table 8 the traditional ordinary least squares (OLS) method using standardized coefficients that allows to compare the magnitude of the effect of each single independent variable.

*** Table 8 about here ***

Table 8 confirms the findings of the main model. In particular, columns 1, 4 and 7 evidence how the development of local banking institutions positively and significantly affect corporate financing decisions. Moreover, columns 3, 6 and 9 indicate that the independent variable measuring national banking development has greater standardized coefficients with respect to the independent variable measuring local banking development. It demonstrates once again that European SMEs benefit most from the development of national banking markets.

Robustness test: structural equation modelling

As additional robustness analysis, I performed in Table 9 the structural equation models (SEMs) technique using the maximum likelihood method with robust standard errors. This empirical test allows for a very accurate estimation of standardized parameters. Considering the dimension of my sample, it is possible to assume that the variables have a joint multivariate normal distribution.

*** Table 8 about here ***

Table 9 reports the SEM results with completely standardized parameters. Moreover, I tested the goodness of fit statistics using the Standardized Root Mean Square Residual (SRMR) index, whose average value is 0.007 for regression in column 1-9. Thus, it is possible to conclude that the model fits well, since the threshold value generally accepted is 0.09. Structural equation modelling corroborates the findings obtained through the cluster and OLS techniques. It confirms a positive effect of banking development on SME financial policies and shows that such positive effects is more influenced by the national rather than the local banking markets.

Robustness test: placebo test

As final robustness test, I run the placebo test. My sample has a very high number of observations which could affect the statistical significance of the findings (Athey and Imbens 2017). To make sure that this number does not lead to false statistically significant results I applied a placebo test, in which 200 times (for each dependent variable) I randomly assigned a branch density and a domestic credit provided by the financial sector by banks to each firm of the sample, and each time re-estimated the regression with the variables Local Banking Development and National Banking Development re-shuffled. I expect that in this setting local banking development and national banking development do not significantly influence SMEs' use of deb, cash holdings and trade credit. When I run the placebo test 200 times for each dependent

variable, I find that the estimated coefficients of Local Banking Development and National Banking Development are not statistically significant at the 10% level in more than 90% of the cases[34]. Hence, the results of placebo tests confirm the robustness of my findings, which are thus not influenced by chance.

4.6 Conclusion and implications

Starting from the milestone contribution of Guiso et al. (2004), the financial literature studied the relevance of local banking development for firm growth, with a particular attention on SMEs. However, previous studies, though extremely important, focus on single-country settings of analysis. In a more innovative manner, the present chapter investigates whether local banking markets matters in a wide European context. The empirical results reveal that the development of local banking institutions significantly and positively influences the financial policies of European SMEs. More in detail, I find that the geographic proximity of bank branches has a key role on the financing of SMEs, as it reduces information asymmetries and facilitates credit provision. Moreover, the presence of well-developed banking markets also increases the use of cash holdings by SMEs. In the European context, there appears to be relevant agency costs that are linked with more cash holdings held by SMEs Additionally, my evidences show that also local banking conditions affect trade credit policies too. In particular, higher levels of banking development in a province are associated with more trade credit provided by the suppliers. Therefore, the findings, which are robust to a number of robustness tests, interestingly reveal that local banking development plays an important role in SME finance policies in the large European scenery.

Assuming that local banking development is relevant also in a cross-country environment, this research addresses another important question still unresolved: European SMEs benefit most from local or national banking development? The findings suggest that notwithstanding the relevance of the local contexts, as indicated by the extant literature, the national dimension of the banking system seems to better drive the financial policies of European SMEs. In particular, my moderation study reveals that the relative importance of local banking development decreases with

[34] The results of the 200x3 Placebo test regressions are available upon request.

higher levels of national banking development. Consequently, in those contexts where the national banking institutions are more developed, local credit markets have a poorer influence on SME financial policies. Hence, despite local bank branches are still important, SMEs rely more on the development of the banking macro-system of a country.

My chapter is at the crossroad of two lines of literature that parallelly study local and national banking development. At the same time it goes one step further in these strands of research, as it studies for the first time SME financial policies considering both local and national banking institutions in a wide European setting. The results highlight that the macro (national) banking environment moderates the role of the micro (provincial) context, suggesting to future researchers in this field to take into account the macro-level contingencies in which SMEs are embedded. Thus, the key findings of this chapter concern the need to jointly consider national and local banking development as crucial determinants of financial decisions of European SMEs. Moreover, the work has also implications for policy-makers. Indeed, given that the financial decisions of European SMEs are more influenced by the national rather than the local banking development, the Governments should primarily improve the national banking institutions. Governments should recognize the importance of the national banking system that drives the local baking sector. New regulations aimed at developing and making more attractive the national banking markets are important to ensure SMEs a priority channel to external resources without external frictions. This is especially important during this particular coronavirus (COVID-19) period, where European SMEs strongly need financial resources to recover from the crisis. According to my findings, the banking institutions of a country should act as a fellow traveller that accompanies SMEs towards value creation processes, rather than an obstacle to overcome. With this regard, I recommend policy makers to enhance the effectiveness of the banking systems, especially the national ones, in order to meet the credit need of the European small businesses. Decision-makers could improve European SME access to outside sources of financing making incentive policies and specialized credit patterns for SMEs. Moreover, the presence of strong national banking institutions should be encouraged. The European Commission and the Governments of the single counties of the European Union should move in this

direction, with the final aim to reduce asymmetric information problems of SMEs and, more in general, all the financial constraints that impede the corporate growth. Moreover, Governments should upgrade the role of the banking institutions, making them not only credit providers, but also financial advisers that can provide support in understanding the appropriate financial strategies. This approach could increase not only the quantity, but also the quality of the external funds available for SMEs. It is particularly important, as the managers of SMEs are often in need of more financial skills (Van Auken, 2005) that could affect the quality of the financial decisions.

This without ignoring the relevance of the local banking sector, which is still important, despite the internalization of financial markets, and can significantly support SME business. Certainly, this work does not diminish the importance of the local contexts. Indeed, the growth of the national banking industry should be balanced by the contemporary growth of the provincial banking markets. The empirical evidences show that SMEs remain dependent from the level of local banking development, but they recognize that the big (national) context has a main role over the small (local) in determining the financial decisions of European small businesses.

In conclusion, in the current context where a lot of attention is paid to the financial resources available for SMEs in severe difficulty caused by the coronavirus crisis, it is of importance that European policy-makers formulate policies that promote the development of national banking institutions, as “the state of development of the financial markets does indeed facilitate growth, and is not simply correlated with it” (Rajan and Zingales, 2001).

Table 1 - Hypotheses and model.

Hypotheses	***Model***
H.1	*Debt = f* (local banking development, control variables), cluster(country) cluster(province)
H.2	*Cash Holdings = f* (local banking development, control variables), cluster(country) cluster(province)
H.3	*Trade Credit = f* (local banking development, control variables), cluster(country) cluster(province)
H.4	*Debt = f* (local banking development, national banking development, control variables), cluster(country) cluster(province)
	Cash Holdings = f (local banking development, national banking development, control variables), cluster(country) cluster(province)
	Trade Credit = f (local banking development, national banking development, control variables), cluster(country) cluster(province)

Table 2 – Variables descriptions.

Dependent variable	***Calculation***
Debt	(Long-Term Bank Debt + Short-Term Bank Debt) / Total Assets
Cash Holdings	Cash & cash equivalents / total assets
Trade Credit	(Receivables – payables) / total assets
Explanatory variables	
Local Banking Development	(Total Bank Branches at provincial level × 1000) / Population at provincial level
National Banking Development	Domestic credit provided by financial sector by banks (% of GDP)
ROA	EBIT / Total Assets
Size	ln(total assets)
Tangibility	Tangible Assets / Total Assets
Age	year - year of incorporation
Different Tax Shield	(EBITDA - EBIT) / total assets
Firm Growth	(Sales t – Sales t -1) / Sales t -1
GDP Growth	[(real GDP at provincial level)t – (real GDP at provincial level)t -1] / (real GDP at provincial level)t -1
Enforcement	Mean time required to enforce a right at the provincial level

Table 3 - Descriptive Statistics for the sample.

	Mean	Sd	min	p25	Median	p75	max
Debt	0.202	0.197	0.000	0.021	0.150	0.339	0.847
Cash Holdings	0.097	0.131	0.000	0.009	0.043	0.133	0.991
Trade Credit	0.127	0.206	-2.689	0.002	0.107	0.233	0.999
Local Bank Dev	0.736	0.260	0.172	0.568	0.708	0.880	2.253
National Bank Dev	1.065	0.376	0.637	0.815	0.885	1.360	1.921
ROA	0.060	0.101	-0.317	0.017	0.048	0.098	0.434
Size	8.697	0.903	1.946	8.034	8.706	9.367	10.669
Tangibility	0.226	0.198	0.000	0.067	0.172	0.335	0.996
Age	2.917	0.762	0.000	2.485	3.045	3.434	5.347
Different Tax Shield	0.039	0.027	0.002	0.018	0.033	0.054	0.104
Firm Growth	-0.056	0.319	-17.054	-0.146	-0.032	0.077	0.947
GDP Growth	0.240	0.019	0.136	0.233	0.240	0.255	0.271
Enforcement	0.082	0.041	0.023	0.040	0.052	0.121	0.139

Table 4 – Correlation matrix

		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	VIF
(1)	Debt	1.00													1.20
(2)	Cash Holdings	-0.33	1.00												1.21
(3)	Trade Credit	-0.03	-0.06	1.00											1.20
(4)	Local Bank Dev	0.06	0.03	0.21	1.00										1.73
(5)	National Bank Dev	0.06	0.07	0.26	0.62	1.00									2.63
(6)	ROA	-0.23	0.27	0.09	-0.00	-0.01	1.00								1.14
(7)	Size	0.20	-0.18	-0.15	-0.01	-0.04	-0.10	1.00							1.17
(8)	Tangibility	0.24	-0.21	-0.22	0.01	0.05	-0.11	0.12	1.00						1.44
(9)	Age	-0.05	0.00	-0.03	-0.03	-0.04	-0.04	0.16	0.07	1.00					1.06
(10)	Diff. Tax Shield	0.05	-0.08	-0.12	-0.03	-0.03	-0.07	-0.11	0.44	-0.04	1.00				1.31
(11)	Firm Growth	0.01	-0.01	0.00	0.01	0.03	-0.17	-0.07	0.05	0.12	0.03	1.00			1.06
(12)	GDP Growth	-0.12	0.08	0.09	0.19	0.18	-0.02	-0.06	-0.17	0.03	-0.10	0.01	1.00		1.09
(13)	Enforcement	0.12	-0.19	-0.12	-0.22	-0.58	-0.08	0.19	-0.01	0.02	-0.06	0.00	-0.05	1.00	1.73

Notes: Industry dummies are not reported. All the correlations different from 0.00 are statistically significant at the 0.01 level.

Table 5 - Main model: results concerning local banking development and SME financial policies

Estimation technique:	(1) OLS Cluster	(2) OLS Cluster	(3) OLS Cluster	(4) OLS Cluster	(5) OLS Cluster	(6) OLS Cluster	(7) OLS Cluster	(8) OLS Cluster	(9) OLS Cluster
Dependent Variable	Debt	Debt	Debt	Cash Holdings	Cash Holdings	Cash Holdings	Trade Credit	Trade Credit	Trade Credit
Local Bank Dev	0.062***		0.013	0.025***		0.015***	0.158**		0.051***
	(0.017)		(0.019)	(0.005)		(0.002)	(0.065)		(0.017)
Nat Bank Dev		0.085***	0.078**		0.025***	0.017***		0.191***	0.164**
		(0.025)	(0.033)		(0.003)	(0.002)		(0.068)	(0.068)
Debt				-0.144***	-0.145***	-0.145***	0.028	0.009	0.008
				(0.012)	(0.011)	(0.011)	(0.061)	(0.067)	(0.067)
Cash Holdings	-0.334***	-0.335***	-0.336***				-0.270***	-0.268***	-0.270***
	(0.091)	(0.091)	(0.091)				(0.073)	(0.071)	(0.071)
Trade Credit	0.025	0.008	0.008	-0.103***	-0.106***	-0.107***			
	(0.056)	(0.062)	(0.061)	(0.015)	(0.015)	(0.015)			
ROA	-0.281***	-0.273***	-0.274***	0.258***	0.259***	0.259***	0.217***	0.221***	0.219***
	(0.059)	(0.060)	(0.061)	(0.030)	(0.031)	(0.031)	(0.077)	(0.077)	(0.077)
Size	0.031***	0.029***	0.029***	-0.011*	-0.011*	-0.011*	-0.034	-0.036	-0.036
	(0.007)	(0.007)	(0.007)	(0.006)	(0.006)	(0.006)	(0.027)	(0.028)	(0.027)
Tangibility	0.167***	0.154***	0.154***	-0.108***	-0.111***	-0.110***	-0.175***	-0.194***	-0.193***
	(0.029)	(0.024)	(0.023)	(0.014)	(0.014)	(0.014)	(0.033)	(0.029)	(0.028)
Age	-0.021***	-0.020***	-0.020***	0.006***	0.007***	0.006***	0.006	0.008	0.008
	(0.005)	(0.005)	(0.005)	(0.002)	(0.002)	(0.002)	(0.010)	(0.010)	(0.010)
Diff. Tax Shield	-0.267**	-0.235*	-0.238*	-0.199***	-0.189***	-0.193***	-0.409**	-0.327**	-0.339**
	(0.130)	(0.138)	(0.142)	(0.044)	(0.044)	(0.044)	(0.180)	(0.154)	(0.156)
Firm Growth	0.000	-0.001	-0.001	0.011***	0.011***	0.011***	0.011	0.008	0.008
	(0.006)	(0.007)	(0.007)	(0.003)	(0.004)	(0.003)	(0.014)	(0.016)	(0.015)
GDP Growth	-0.954***	-1.076***	-1.087***	0.024	0.006	-0.007	0.151	-0.106	-0.151
	(0.262)	(0.157)	(0.166)	(0.099)	(0.084)	(0.075)	(0.471)	(0.250)	(0.260)
Enforcement	0.302	0.657***	0.636***	-0.404***	-0.307***	-0.330***	-0.440	0.361	0.282
	(0.267)	(0.174)	(0.181)	(0.069)	(0.055)	(0.053)	(0.374)	(0.242)	(0.232)
Adj. R2	0.220	0.227	0.227	0.240	0.240	0.240	0.203	0.229	0.231
Observations	285.974	285.974	285.974	285.974	285.974	285.974	285.974	285.974	285.974

Notes: Industry and year fixed effects are the controls. The *p*-values in parentheses are based on standard errors clustered by countries and provinces. The superscripts denote significance as follows: $^{*}p< 0.10$, $^{**}p< 0.05$, $^{***}p< 0.01$. Regressions report standardized beta coefficients and standard errors in brackets.

Table 6 - results concerning the moderating effect of national on local banking development

Estimation technique:	(1) OLS Cluster	(2) OLS Cluster	(3) OLS Cluster
Dependent Variable	Debt	Cash Holdings	Trade Credit
Local Bank Dev	0.077**	0.063**	0.152
	(0.032)	(0.031)	(0.117)
Nat Bank Dev	0.120***	0.049**	0.230**
	(0.022)	(0.022)	(0.113)
Local * National	-0.052**	-0.039	-0.082
Bank Dev (interaction)	(0.020)	(0.024)	(0.077)
Debt		-0.146***	0.007
		(0.011)	(0.067)
Cash Holdings	-0.337***		-0.271***
	(0.091)		(0.071)
Trade Credit	0.007	-0.107***	
	(0.062)	(0.016)	
Control Variables	Yes	Yes	Yes
Adj. R2	0.228	0.241	0.232
Observations	285.974	285.974	285.974

Notes: Industry and year fixed effects are the controls. The *p*-values in parentheses are based on standard errors clustered by countries and provinces. The superscripts denote significance as follows: $^{*}p< 0.10$, $^{**}p< 0.05$, $^{***}p< 0.01$. Regressions report standardized beta coefficients and standard errors in brackets. Full Table is available upon request.

Table 7 – Further test: results concerning local banking development and SME financial policies distinguishing between long and short term bank debt

Estimation technique:	(1) OLS Cluster	(2) OLS Cluster	(3) OLS Cluster	(4) OLS Cluster	(5) OLS Cluster	(6) OLS Cluster
Dependent Variable	Short Debt	Short Debt	Short Debt	Long Debt	Long Debt	Long Debt
Local Bank Dev	0.009		-0.013	0.053***		0.025***
	(0.015)		(0.020)	(0.015)		(0.003)
Nat Bank Dev		0.028	0.035		0.059***	0.045***
		(0.033)	(0.039)		(0.013)	(0.011)
Cash Holdings	-0.237***	-0.238***	-0.238***	-0.097***	-0.097***	-0.098***
	(0.078)	(0.077)	(0.078)	(0.036)	(0.036)	(0.036)
Trade Credit	0.026	0.017	0.018	-0.002	-0.010	-0.011
	(0.042)	(0.047)	(0.046)	(0.017)	(0.019)	(0.019)
Control Variables	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R2	0.176	0.179	0.179	0.210	0.214	0.215
Observations	285.974	285.974	285.974	285.974	285.974	285.974

Notes: Industry and year fixed effects are the controls. The *p*-values in parentheses are based on standard errors clustered by countries and provinces. The superscripts denote significance as follows: $^{*}p< 0.10$, $^{**}p< 0.05$, $^{***}p< 0.01$. Regressions report standardized beta coefficients and standard errors in brackets. Full Table is available upon request.

Table 8 – Robustness test: results concerning local banking development and SME financial policies

Estimation technique:	(1) OLS	(2) OLS	(3) OLS	(4) OLS	(5) OLS	(6) OLS	(7) OLS	(8) OLS	(9) OLS
Dependent Variable	Debt	Debt	Debt	Cash Holdings	Cash Holdings	Cash Holdings	Trade Credit	Trade Credit	Trade Credit
Local Bank Dev	0.082***		0.017***	0.051***		0.030***	0.198***		0.064***
	(0.001)		(0.002)	(0.001)		(0.001)	(0.002)		(0.002)
Nat Bank. Dev		0.162***	0.149***		0.072***	0.049***		0.348***	0.298***
		(0.001)	(0.002)		(0.001)	(0.001)		(0.001)	(0.002)
Debt				-0.216***	-0.219***	-0.219***	0.026***	0.009***	0.008***
				(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)
Cash Holdings	-0.222***	-0.222***	-0.223***				-0.171***	-0.170***	-0.171***
	(0.003)	(0.003)	(0.003)				(0.003)	(0.003)	(0.003)
Trade Credit	0.026***	0.009***	0.008***	-0.163***	-0.167***	-0.169***			
	(0.002)	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)			
Control Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R2	0.220	0.227	0.227	0.240	0.240	0.240	0.203	0.229	0.231
Observations	285.974	285.974	285.974	285.974	285.974	285.974	285.974	285.974	285.974

Notes: Industry and year fixed effects are the controls. The p-values in parentheses are based on standard errors clustered by countries and provinces. The superscripts denote significance as follows: *p< 0.10, **p< 0.05, ***p< 0.01. Regressions report standardized beta coefficients and standard errors in brackets. Full Table is available upon request.

Table 9 – Robustness test: results concerning local banking development and SME financial policies

Estimation technique:	(1) SEM	(2) SEM	(3) SEM	(4) SEM	(5) SEM	(6) SEM	(7) SEM	(8) SEM	(9) SEM
Dependent Variable	Debt	Debt	Debt	Cash Holdings	Cash Holdings	Cash Holdings	Trade Credit	Trade Credit	Trade Credit
Local Bank Dev	0.092***		0.018***	0.048***		0.023***	0.198***		0.067***
	(0.001)		(0.002)	(0.001)		(0.001)	(0.001)		(0.002)
Nat. Bank Dev		0.170***	0.157***		0.070***	0.054***		0.316***	0.267***
		(0.001)	(0.001)		(0.001)	(0.001)		(0.001)	(0.002)
Debt				-0.215***	-0.219***	-0.219***	0.019***	-0.001	-0.002
				(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)
Cash Holdings	-0.218***	-0.220***	-0.220***				-0.167***	-0.168***	-0.169***
	(0.003)	(0.003)	(0.003)				(0.003)	(0.003)	(0.003)
Trade Credit	0.017***	-0.001	-0.002	-0.154***	-0.159***	-0.160***			
	(0.002)	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)			
Control Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R2	0.214	0.235	0.238	0.211	0.211	0.212	0.198	0.219	0.231
Observations	285.974	285.974	285.974	285.974	285.974	285.974	285.974	285.974	285.974

Notes: Industry and year fixed effects are the controls. The p-values in parentheses are based on standard errors clustered by countries and provinces. The superscripts denote significance as follows: *p< 0.10, **p< 0.05, ***p< 0.01. Regressions report standardized beta coefficients and standard errors in brackets. Full Table is available upon request.

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Appendix

Table A.1 – Descriptive Statistics of debt, cash holdings and trade credit for high and low levels of local banking development based on median

High Local Banking Development

	Mean	Sd	min	p25	Median	p75	max
Debt	0.216	0.204	0.000	0.025	0.168	0.359	0.847
Cash Holdings	0.098	0.132	0.000	0.009	0.043	0.133	0.989
Trade Credit	0.164	0.218	-2.451	0.024	0.133	0.276	0.999

Low Local Banking Development

	Mean	Sd	min	p25	Median	p75	max
Debt	0.188	0.188	0.000	0.017	0.133	0.317	0.847
Cash Holdings	0.095	0.129	0.000	0.008	0.042	0.133	0.991
Trade Credit	0.090	0.186	-2.689	-0.010	0.083	0.194	0.969

Table A.2 – Mean and median of debt, cash holdings and trade credit for high and low levels of national banking development based on median

High National Banking Development

	Mean	Sd	min	p25	Median	p75	max
Debt	0.204	0.203	0.000	0.020	0.146	0.337	0.847
Cash Holdings	0.106	0.139	0.000	0.011	0.050	0.148	0.991
Trade Credit	0.157	0.219	-2.451	0.021	0.127	0.268	0.999

Low National Banking Development

	Mean	Sd	min	p25	Median	p75	max
Debt	0.198	0.192	0.000	0.020	0.149	0.335	0.847
Cash Holdings	0.093	0.128	0.000	0.007	0.040	0.128	0.991
Trade Credit	0.097	0.189	-2.689	-0.005	0.088	0.199	0.991

Figure A.1 – Trend of Debt, Cash Holdings and Trade Credit during the years

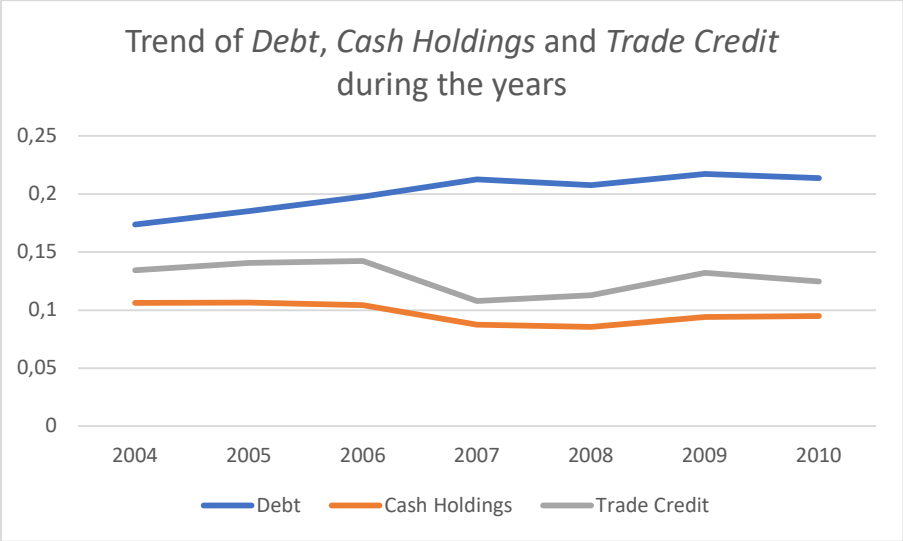

Table A.4 – Descriptive Statistics of debt, cash holdings and trade credit for high and low levels of local banking development based on 25 and 75 percentile

	High Local Banking Development						
	Mean	Sd	min	p25	Median	p75	max
Debt	0.206	0.207	0.000	0.019	0.147	0.344	0.847
Cash Holdings	0.108	0.139	0.000	0.014	0.052	0.147	0.979
Trade Credit	0.214	0.232	-2.451	0.053	0.179	0.349	0.999

	Low Local Banking Development						
	Mean	Sd	min	p25	Median	p75	max
Debt	0.181	0.186	0.000	0.016	0.121	0.303	0.847
Cash Holdings	0.094	0.128	0.000	0.008	0.042	0.130	0.934
Trade Credit	0.085	0.186	-2.689	-0.013	0.079	0.189	0.969

Table A.5 – Mean and median of debt, cash holdings and trade credit for high and low levels of national banking development based on 25 and 75 percentile

	High National Banking Development						
	Mean	Sd	min	p25	Median	p75	max
Debt	0.216	0.216	0.000	0.023	0.153	0.356	0.847
Cash Holdings	0.112	0.142	0.000	0.015	0.056	0.153	0.991
Trade Credit	0.221	0.229	-2.451	0.061	0.181	0.351	0.999

	Low National Banking Development						
	Mean	Sd	min	p25	Median	p75	max
Debt	0.202	0.191	0.000	0.022	0.157	0.341	0.847
Cash Holdings	0.088	0.123	0.000	0.006	0.036	0.121	0.991
Trade Credit	0.094	0.185	-2.689	-0.005	0.086	0.196	0.991

Table A.6 correlation matrix of debt, cash holdings and trade credit for high and low levels of local banking development based on 25 and 75 percentile

	High Local Banking Development		
	Debt	Cash Holdings	Trade Credit
Debt	1.00		
Cash Holdings	-0.33***	1.00	
Trade Credit	-0.18***	-0.06***	1.00

$^{+}p < 0.10$, $^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$

	Low Local Banking Development		
	Debt	Cash Holdings	Trade Credit
Debt	1.00		
Cash Holdings	-0.30***	1.00	
Trade Credit	0.02***	-0.06***	1.00

$^{+}p < 0.10$, $^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$

Table A.7 – Mean and median of debt, cash holdings and trade credit for high and low levels of national banking development based on 25 and 75 percentile

	High National Banking Development		
	Debt	Cash Holdings	Trade Credit
Debt	1.00		
Cash Holdings	-0.31***	1.00	
Trade Credit	-0.20***	-0.07***	1.00

$^{+}p < 0.10$, $^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$

	Low National Banking Development		
	Debt	Cash Holdings	Trade Credit
Debt	1.00		
Cash Holdings	-0.37***	1.00	
Trade Credit	0.09***	-0.12***	1.00

$^{+}p < 0.10$, $^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$

Table A.8 correlation matrix of debt, cash holdings and trade credit for high and low levels of local banking development based on median

	High Local Banking Development		
	Debt	Cash Holdings	Trade Credit
Debt	1.00		
Cash Holdings	-0.34***	1.00	
Trade Credit	-0.11***	-0.04***	1.00

$^{+}p < 0.10$, $^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$

	Low Local Banking Development		
	Debt	Cash Holdings	Trade Credit
Debt	1.00		
Cash Holdings	-0.32***	1.00	
Trade Credit	0.04***	-0.09***	1.00

$^{+}p < 0.10$, $^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$

Table A.9 – Mean and median of debt, cash holdings and trade credit for high and low levels of national banking development based on median

	High National Banking Development		
	Debt	Cash Holdings	Trade Credit
Debt	1.00		
Cash Holdings	-0.36***	1.00	
Trade Credit	0.08***	-0.12***	1.00

$^{+}p < 0.10$, $^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$

	Low National Banking Development		
	Debt	Cash Holdings	Trade Credit
Debt	1.00		
Cash Holdings	-0.36***	1.00	
Trade Credit	0.08***	-0.12***	1.00

$^{+}p < 0.10$, $^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$

Table A.10 –local banking development and corporate financial policies before and after the global financial crisis

Estimation technique	(year >= 2008)	(year < 2008)	(year >= 2008)	(year < 2008)	(year >= 2008)	(year < 2008)
OLS Cluster	Debt	Debt	Cash Holdings	Cash Holdings	Trade Credit	Trade Credit
Local Bank Dev	0.047***	0.002***	0.022***	0.027***	-0.016***	0.107***
	(0.003)	(0.002)	(0.002)	(0.002)	(0.003)	(0.002)
Nat Bank Dev	0.119***	0.148***	0.001	0.102***	0.337***	0.291***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Debt			-0.223***	-0.215***	0.028***	-0.001
			(0.002)	(0.002)	(0.003)	(0.003)
Cash Holdings	-0.232***	-0.215***			-0.161***	-0.181***
	(0.004)	(0.003)			(0.004)	(0.004)
Trade Credit	0.028***	-0.001	-0.156***	-0.183***		
	(0.003)	(0.002)	(0.002)	(0.002)		
ROA	-0.135***	-0.143***	0.203***	0.199***	0.103***	0.111***
	(0.006)	(0.005)	(0.004)	(0.004)	(0.006)	(0.006)
Size	0.107***	0.153***	-0.088***	-0.073***	-0.137***	-0.170***
	(0.001)	(0.001)	(0.000)	(0.000)	(0.001)	(0.001)
Tangibility	0.156***	0.161***	-0.163***	-0.175***	-0.184***	-0.196***
	(0.003)	(0.003)	(0.002)	(0.002)	(0.003)	(0.003)
Age	-0.088***	-0.067***	0.043***	0.037***	0.042***	0.023***
	(0.001)	(0.001)	(0.000)	(0.000)	(0.001)	(0.001)
Diff. Tax Shield	-0.011***	-0.056***	-0.035***	-0.043***	-0.046***	-0.040***
	(0.023)	(0.020)	(0.014)	(0.013)	(0.022)	(0.021)
Firm Growth	0.000	-0.005*	0.028***	0.026***	0.023***	0.007***
	(0.002)	(0.002)	(0.001)	(0.001)	(0.002)	(0.002)
GDP Growth	-0.106***	-0.098***	0.007**	-0.003	0.003	-0.024***
	(0.029)	(0.027)	(0.020)	(0.018)	(0.026)	(0.025)
Enforcement	0.078***	0.167***	-0.130***	-0.075***	0.084***	0.048***
	(0.017)	(0.013)	(0.014)	(0.010)	(0.018)	(0.015)
Adj. R2	0.214	0.241	0.246	0.241	0.223	0.249
Observations	126739	159235	126739	159235	126739	159235

Notes: Industry and year fixed effects are the controls. The *p*-values in parentheses are based on standard errors clustered by countries and provinces. The superscripts denote significance as follows: $^{*}p< 0.10$, $^{**}p< 0.05$, $^{***}p< 0.01$. Regressions report standardized beta coefficients and standard errors in brackets.

Table A.11 – local banking development and debt policies for each country

Estimation technique	(Finland)	(France)	(Germany)	(Italy)	(Spain)	(United Kingdom)
OLS Cluster	Debt	Debt	Debt	Debt	Debt	Debt
Local Bank Dev	0.032	0.017***	-0.008	0.074***	0.034***	0.010*
	(0.020)	(0.005)	(0.017)	(0.003)	(0.004)	(0.006)
Nat Bank Dev	0.194	0.206***	-0.041	0.064**	0.064***	0.097
	(0.522)	(0.011)	(0.059)	(0.031)	(0.004)	(0.077)
Cash Holdings	-0.264***	-0.127***	-0.275***	-0.509***	-0.350***	-0.244***
	(0.020)	(0.003)	(0.016)	(0.005)	(0.005)	(0.011)
Trade Credit	0.041**	0.008**	0.052***	0.106***	-0.096***	0.136***
	(0.020)	(0.004)	(0.016)	(0.003)	(0.004)	(0.012)
ROA	-0.216***	-0.135***	-0.232***	-0.372***	-0.259***	-0.512***
	(0.019)	(0.006)	(0.020)	(0.006)	(0.008)	(0.013)
Size	-0.033***	0.004***	-0.014***	0.027***	0.040***	0.021***
	(0.003)	(0.001)	(0.003)	(0.001)	(0.001)	(0.002)
Tangibility	0.340***	0.135***	0.342***	0.116***	0.177***	0.077***
	(0.016)	(0.007)	(0.015)	(0.003)	(0.005)	(0.011)
Age	-0.015***	-0.012***	-0.006**	-0.015***	-0.035***	-0.052***
	(0.003)	(0.001)	(0.003)	(0.001)	(0.001)	(0.002)
Diff. Tax Shield	-0.488***	0.212***	-0.530***	-0.544***	-0.121***	-0.136*
	(0.105)	(0.031)	(0.096)	(0.022)	(0.030)	(0.070)
Firm Growth	-0.025***	-0.004	-0.003	0.007***	-0.006***	-0.044***
	(0.008)	(0.003)	(0.007)	(0.002)	(0.002)	(0.006)
GDP Growth	-0.008	-0.259***	1.015***	-0.644***	0.059	-0.118
	(0.306)	(0.067)	(0.240)	(0.050)	(0.069)	(0.182)
Enforcement	-0.193	-1.099***	2.638*	0.724*	-0.987***	0.739
	(8.724)	(0.188)	(1.073)	(0.407)	(0.162)	(8.518)
Adj. R2	0.319	0.182	0.251	0.234	0.281	0.205
Observations	5777	48314	8765	133613	68912	20593

Notes: Industry and year fixed effects are the controls. The *p*-values in parentheses are based on standard errors clustered by countries and provinces. The superscripts denote significance as follows: $^{*}p< 0.10$, $^{**}p< 0.05$, $^{***}p< 0.01$. Regressions report standardized beta coefficients and standard errors in brackets.

Table A.12 – local banking development and cash holdings policies for each country

Estimation technique	(Finland)	(France)	(Germany)	(Italy)	(Spain)	(United Kingdom)
OLS Cluster	Debt	Debt	Debt	Debt	Debt	Debt
Local Bank Dev	-0.034***	-0.002	0.014	-0.006***	0.015***	0.011***
	(0.011)	(0.006)	(0.011)	(0.002)	(0.003)	(0.004)
Nat Bank Dev	-0.312	0.113***	0.075*	0.012	-0.039***	0.017
	(0.297)	(0.014)	(0.040)	(0.017)	(0.003)	(0.048)
Debt	-0.095***	-0.183***	-0.109***	-0.147***	-0.164***	-0.093***
	(0.007)	(0.005)	(0.006)	(0.001)	(0.002)	(0.004)
Trade Credit	-0.077***	-0.062***	-0.072***	-0.114***	-0.186***	-0.102***
	(0.013)	(0.004)	(0.011)	(0.002)	(0.003)	(0.007)
ROA	0.198***	0.329***	0.212***	0.271***	0.243***	0.122***
	(0.015)	(0.006)	(0.014)	(0.004)	(0.006)	(0.008)
Size	-0.008***	-0.016***	-0.003	-0.002***	-0.030***	-0.003**
	(0.002)	(0.001)	(0.002)	(0.000)	(0.001)	(0.001)
Tangibility	-0.105***	-0.154***	-0.111***	-0.093***	-0.148***	-0.146***
	(0.008)	(0.005)	(0.008)	(0.001)	(0.003)	(0.005)
Age	0.000	0.015***	0.001	0.007***	0.003***	-0.002
	(0.002)	(0.001)	(0.002)	(0.000)	(0.001)	(0.001)
Diff. Tax Shield	0.028	-0.098***	-0.051	-0.099***	-0.314***	-0.329***
	(0.059)	(0.032)	(0.060)	(0.011)	(0.020)	(0.039)
Firm Growth	0.012**	0.021***	0.012**	0.016***	0.003**	0.003
	(0.006)	(0.003)	(0.005)	(0.001)	(0.001)	(0.003)
GDP Growth	-0.850***	-0.530***	-0.535***	-0.046*	0.031	0.039
	(0.175)	(0.082)	(0.160)	(0.027)	(0.047)	(0.116)
Enforcement	-0.225	-1.776***	-1.194**	-0.465**	-2.112***	1.459
	(0.966)	(0.681)	(0.559)	(0.225)	(0.459)	(0.684)
Adj. R2	0.244	0.220	0.233	0.242	0.287	0.169
Observations	5777	48314	8765	133613	68912	20593

Notes: Industry and year fixed effects are the controls. The *p*-values in parentheses are based on standard errors clustered by countries and provinces. The superscripts denote significance as follows: $^{*}p< 0.10$, $^{**}p< 0.05$, $^{***}p< 0.01$. Regressions report standardized beta coefficients and standard errors in brackets.

Table A.13 – local banking development and trade credit policies for each country

Estimation technique	(Finland)	(France)	(Germany)	(Italy)	(Spain)	(United Kingdom)
OLS Cluster	Debt	Debt	Debt	Debt	Debt	Debt
Local Bank Dev	-0.012	-0.019***	0.036***	0.016***	0.040***	0.004
	(0.015)	(0.007)	(0.012)	(0.003)	(0.004)	(0.004)
Nat Bank Dev	-0.122	-0.046***	-0.003	-0.006	0.006	0.025
	(0.339)	(0.016)	(0.043)	(0.032)	(0.005)	(0.048)
Debt	0.019**	0.016**	0.026***	0.101***	-0.107***	0.056***
	(0.009)	(0.008)	(0.008)	(0.003)	(0.004)	(0.005)
Cash Holdings	-0.097***	-0.088***	-0.089***	-0.374***	-0.442***	-0.109***
	(0.016)	(0.005)	(0.013)	(0.005)	(0.005)	(0.007)
ROA	0.160***	0.278***	0.176***	0.391***	0.096***	0.111***
	(0.017)	(0.009)	(0.016)	(0.007)	(0.009)	(0.009)
Size	0.001	0.001	-0.002	0.000	-0.102***	-0.021***
	(0.002)	(0.001)	(0.002)	(0.001)	(0.001)	(0.001)
Tangibility	-0.113***	-0.052***	-0.152***	-0.229***	-0.281***	-0.115***
	(0.009)	(0.007)	(0.009)	(0.003)	(0.004)	(0.006)
Age	-0.004**	0.018***	0.007***	0.024***	-0.017***	0.005***
	(0.002)	(0.001)	(0.002)	(0.001)	(0.001)	(0.001)
Diff. Tax Shield	-0.049	-0.391***	0.035	-0.034	-0.628***	-0.357***
	(0.073)	(0.043)	(0.068)	(0.021)	(0.030)	(0.042)
Firm Growth	0.009	0.016***	0.015**	0.036***	-0.020***	-0.007**
	(0.007)	(0.004)	(0.008)	(0.002)	(0.003)	(0.003)
GDP Growth	0.001	-0.032	0.450***	0.434***	-0.068	0.137
	(0.199)	(0.092)	(0.174)	(0.050)	(0.072)	(0.117)
Enforcement	2.803	-1.884***	2.203	-1.188***	-1.944***	5.485
	(0.642)	(0.681)	(1.154)	(0.413)	(0.529)	(0.548)
Adj. R2	0.252	0.247	0.159	0.195	0.389	0.168
Observations	5777	48314	8765	133613	68912	20593

Notes: Industry and year fixed effects are the controls. The *p*-values in parentheses are based on standard errors clustered by countries and provinces. The superscripts denote significance as follows: $^{*}p< 0.10$, $^{**}p< 0.05$, $^{***}p< 0.01$. Regressions report standardized beta coefficients and standard errors in brackets.

Table A.14 – local banking development and debt policies for each year

Estimation technique	(2004)	(2005)	(2006)	(2007)	(2008)	(2009)	(2010)
OLS Cluster	Debt	Debt	Debt	Debt	Debt	Debt	Debt
Local Bank Dev	-0.021***	-0.013**	-0.013***	-0.004	0.030***	0.044***	0.033***
	(0.005)	(0.005)	(0.005)	(0.005)	(0.006)	(0.005)	(0.005)
Nat Bank Dev	0.216***	0.147***	0.075***	0.060***	0.055***	0.060***	0.060***
	(0.007)	(0.006)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
Cash Holdings	-0.274***	-0.323***	-0.319***	-0.352***	-0.365***	-0.377***	-0.354***
	(0.006)	(0.006)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)
Trade Credit	-0.004	-0.029***	-0.037***	0.049***	0.037***	0.020***	0.026***
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
ROA	-0.272***	-0.242***	-0.275***	-0.330***	-0.273***	-0.245***	-0.264***
	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)
Size	0.039***	0.030***	0.032***	0.028***	0.027***	0.023***	0.021***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Tangibility	0.121***	0.147***	0.160***	0.192***	0.111***	0.164***	0.172***
	(0.007)	(0.007)	(0.007)	(0.007)	(0.006)	(0.006)	(0.006)
Age	-0.014***	-0.016***	-0.018***	-0.018***	-0.024***	-0.024***	-0.021***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Diff. Tax Shield	-0.347***	-0.394***	-0.375***	-0.341***	0.004	-0.147***	-0.095**
	(0.039)	(0.038)	(0.040)	(0.041)	(0.041)	(0.040)	(0.040)
Firm Growth	-0.002	-0.007**	-0.006	0.002	0.007**	0.003	-0.007**
	(0.003)	(0.004)	(0.004)	(0.003)	(0.004)	(0.003)	(0.003)
GDP Growth	-1.279***	-1.075***	-0.938***	-1.034***	-1.197***	-1.016***	-1.047***
	(0.059)	(0.056)	(0.052)	(0.050)	(0.051)	(0.052)	(0.051)
Enforcement	0.867***	0.992***	0.775***	0.841***	0.446***	0.390***	0.376***
	(0.029)	(0.028)	(0.029)	(0.027)	(0.030)	(0.032)	(0.029)
Adj. R2	0.253	0.259	0.232	0.229	0.208	0.213	0.215
Observations	35230	38642	41476	43887	40363	43002	43374

Notes: Industry and year fixed effects are the controls. The *p*-values in parentheses are based on standard errors clustered by countries and provinces. The superscripts denote significance as follows: $^{*}p< 0.10$, $^{**}p< 0.05$, $^{***}p< 0.01$. Regressions report standardized beta coefficients and standard errors in brackets.

Table A.15 – local banking development and cash holdings policies for each year

Estimation technique	(2004)	(2005)	(2006)	(2007)	(2008)	(2009)	(2010)
OLS Cluster	Cash Holdings	Cash Holdings	Cash Holdings	Cash Holdings	Cash Holdings	Cash Holdings	Cash Holdings
Local Bank Dev	0.016***	0.012***	0.008**	-0.006**	0.005*	0.014***	0.015***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.002)
Nat Bank Dev	0.063***	0.072***	0.066***	0.011***	0.008***	-0.006**	0.017***
	(0.005)	(0.004)	(0.003)	(0.003)	(0.003)	(0.003)	(0.002)
Debt	-0.150***	-0.170***	-0.155***	-0.132***	-0.136***	-0.143***	-0.145***
	(0.004)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.011)
Trade Credit	-0.111***	-0.126***	-0.136***	-0.100***	-0.099***	-0.094***	
	(0.004)	(0.004)	(0.003)	(0.003)	(0.003)	(0.003)	
ROA	0.284***	0.289***	0.282***	0.233***	0.229***	0.267***	-0.107***
	(0.009)	(0.009)	(0.008)	(0.007)	(0.007)	(0.007)	(0.015)
Size	-0.007***	-0.011***	-0.012***	-0.010***	-0.012***	-0.013***	0.259***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.031)
Tangibility	-0.141***	-0.133***	-0.137***	-0.097***	-0.097***	-0.098***	-0.011*
	(0.004)	(0.004)	(0.004)	(0.003)	(0.003)	(0.003)	(0.006)
Age	0.007***	0.007***	0.006***	0.006***	0.006***	0.008***	-0.110***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.014)
Diff. Tax Shield	-0.189***	-0.220***	-0.193***	-0.197***	-0.184***	-0.198***	0.006***
	(0.028)	(0.026)	(0.026)	(0.024)	(0.023)	(0.024)	(0.002)
Firm Growth	0.013***	0.012***	0.013***	0.009***	0.009***	0.010***	-0.193***
	(0.003)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.044)
GDP Growth	-0.012	-0.110***	0.016	0.065**	0.008	0.081**	0.011***
	(0.040)	(0.038)	(0.035)	(0.033)	(0.035)	(0.035)	(0.003)
Enforcement	-0.262***	-0.089***	-0.145***	-0.273***	-0.353***	-0.438***	-0.007
	(0.022)	(0.022)	(0.023)	(0.021)	(0.022)	(0.023)	(0.075)
Adj. R2	0.229	0.253	0.255	0.224	0.239	0.244	0.240
Observations	35230	38642	41476	43887	40363	43002	43374

Notes: Industry and year fixed effects are the controls. The *p*-values in parentheses are based on standard errors clustered by countries and provinces. The superscripts denote significance as follows: $^{*}p< 0.10$, $^{**}p< 0.05$, $^{***}p< 0.01$. Regressions report standardized beta coefficients and standard errors in brackets.

Table A.16 – local banking development and trade credit policies for each year

Estimation technique	(2004)	(2005)	(2006)	(2007)	(2008)	(2009)	(2010)
OLS Cluster	Trade Credit	Trade Credit	Trade Credit	Trade Credit	Trade Credit	Trade Credit	Trade Credit
Local Bank Dev	0.135***	0.083***	0.045***	0.028***	-0.002	-0.029***	-0.006
	(0.005)	(0.005)	(0.005)	(0.004)	(0.005)	(0.005)	(0.005)
Nat Bank Dev	0.188***	0.242***	0.249***	0.137***	0.129***	0.188***	0.179***
	(0.007)	(0.006)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
Debt	-0.004	-0.036***	-0.045***	0.051***	0.036***	0.019***	0.025***
	(0.006)	(0.006)	(0.006)	(0.005)	(0.005)	(0.005)	(0.005)
Cash Holdings	-0.257***	-0.304***	-0.340***	-0.277***	-0.261***	-0.261***	-0.230***
	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.007)
ROA	0.214***	0.224***	0.236***	0.293***	0.240***	0.188***	0.165***
	(0.012)	(0.012)	(0.012)	(0.011)	(0.011)	(0.011)	(0.011)
Size	-0.041***	-0.046***	-0.047***	-0.020***	-0.020***	-0.034***	-0.035***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Tangibility	-0.220***	-0.233***	-0.236***	-0.221***	-0.179***	-0.184***	-0.170***
	(0.006)	(0.006)	(0.006)	(0.006)	(0.005)	(0.005)	(0.005)
Age	0.004***	0.005***	0.005***	0.014***	0.011***	0.011***	0.011***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Diff. Tax Shield	-0.194***	-0.320***	-0.299***	-0.323***	-0.381***	-0.274***	-0.349***
	(0.042)	(0.041)	(0.041)	(0.040)	(0.039)	(0.038)	(0.039)
Firm Growth	0.006	0.005	0.001	0.011***	0.010**	0.016***	0.017***
	(0.004)	(0.004)	(0.004)	(0.003)	(0.004)	(0.004)	(0.003)
GDP Growth	-0.159***	-0.416***	-0.329***	-0.091*	0.113**	0.101**	-0.142***
	(0.056)	(0.053)	(0.050)	(0.047)	(0.046)	(0.045)	(0.046)
Enforcement	-0.010	0.459***	0.704***	0.264***	0.301***	0.506***	0.507***
	(0.032)	(0.032)	(0.034)	(0.031)	(0.032)	(0.034)	(0.031)
Adj. R2	0.250	0.274	0.291	0.200	0.190	0.236	0.236
Observations	35230	38642	41476	43887	40363	43002	43374

Notes: Industry and year fixed effects are the controls. The *p*-values in parentheses are based on standard errors clustered by countries and provinces. The superscripts denote significance as follows: $^{*}p< 0.10$, $^{**}p< 0.05$, $^{***}p< 0.01$. Regressions report standardized beta coefficients and standard errors in brackets.

Conclusions of the thesis

The future financial markets will become increasingly global and digital. What will the future be like for bank branches and the bank-firm relationship in these forthcoming markets? Considering the importance of banks for the economic development, the question naturally arises.

The present thesis studies four issues in the financial literature context. The first two contribute to the existing studies by exploring new aspects in the relationship between local banking development and SMEs financial decisions. The last two investigate how such relationship is influenced by the advent of globalization and new technologies.

The findings of the first chapter suggest that local banking development reduces SMEs cash holdings, indicating that the close relationship between the firm and the bank branch allow SMEs to obtain bank finance when they need it. This negative effect exists only for those firms using bank debt and for smaller and younger SMEs that live more asymmetric information problems than larger and older SMEs.

The second chapter examines a particular typology of SMEs, namely research spin-offs that have a crucial impact on the economic growth. The results indicate that local banking institutions do not affect research spin-offs performance during their incubation period, when they mainly rely on public contributions. *Vice versa*, the proximity of bank branches becomes relevant when the spin-off enters the market and public funds are no longer available.

The third chapter demonstrates that the positive effect of local banking development on SMEs financial choices exists not only in Italy, bat also in a cross-country European context. Moreover, the effect of local banking development is lower when the development of national financial markets is higher. Therefore, the national banking institutions, which are the expression of the integration of financial markets, moderate the effect of local bank branches concentration.

The last chapter provides evidence that the role of local banking development on SMEs use of debt decreases when the new financial technologies take hold in the financial sector. However, when the bank-entrepreneur relationship is stronger at the presence of cooperative local bank branches, the digitalization loses its relevance on the lending decision processes.

Chapter three and four interestingly also evidence that despite the internalization and digitalization of financial markets, the local banking development still matters. More in general, the overall results of the thesis demonstrate that local banking institutions are still relevant to ensure a long-term future bank-firm relationship. The presence of local bank branches increases the accessibility of bank loans, facilitates corporate financial decisions and, in turn, affects the growth of SMEs. The geographical proximity of bank branches is a force that boosts the growth of small business and research spin-offs that strongly need to catch growth opportunities.

The thesis provides important implications. First, policymakers should help SMEs and spin-offs in those local contexts where the local banking market is less developed. This support is particularly important in information opacity situations, when the SME is young or very small and when the research spin-off faces the incubation phase, during which public resources could not be enough.Indeed, enhancing the effectiveness of the banking systems and increasing the personal contacts between the firm and the bank spur the growth of SMEs and spin-offs, which drive the growth of the entire economy. Dedicated financial policies, also based on FinTech, could reduce information asymmetries and support corporate financial strategies. This is particularly important during the recent COVID-19 crisis, where banks should help SMEs by financing their activities. During the recent coronavirus crisis, SMEs strongly need financial resources to recover from the revenue collapse. SMEs will be more likely to survive the COVID-19 crisis when they are embedded in well-developed local banking provinces, where local bankers are aware of the opportunities of relaunching of their customers. Moreover, banks should act not only as credit providers, but also as resources sharers able to the split the industry risk. They should be financial advisers, providing high convenient loans that help SMEs and research spin-offs during their growth stages.

Additionally, a key implication of my work is that small firms and spin-offs strongly rely on close personal relationships with the banker, even in a world where globalization and FinTech rapidly grow. FinTech matters, but the discretion of a banker cannot be replaced by using the hard information provided by new digital technologies. However, the role of bank branches is evolving and banking institutions should rethink their future business models in the light of FinTech. A possible implication could be to develop FinTech using hard information in order to favor the

acquisition of soft information and support qualitative loan decisions, making the bank-firm relationship stronger.

From a firm-level point of view, managers of SMEs and research spin-offs should try to decrease the informational gap between the firm and the bank, also reducing the physical and informational distance from their credit providers. Moreover, entrepreneurs should take the opportunity of new FinTech instruments in order to reduce the bank-firm informational imbalance. In conclusion, banking development should further be encouraged as it could positively affect the growth of the millions of European SMEs and, in turn, of the entire European economy.

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