Three essays on firm investment, trade credit, and exports

JOSÉ MANUEL MANSILLA FERNÁNDEZ

SCHOOL OF ECONOMICS AND MANAGEMENT

Department of Economics

Ph.D. THESIS

Advisors:

PROF. SANTIAGO CARBÓ-VALVERDE

DR. FRANCISCO RODRÍGUEZ-FERNÁNDEZ

Granada, May 2013

AUTORIZACIÓN DE LOS DIRECTORES PARA LA PRESENTACIÓN DE ESTA TESIS

Dr. SANTIAGO CARBÓ VALVERDE, Catedrático de Fundamentos del Análisis Económico de la Bangor Business School, y Dr. FRANCISCO RODRÍGUEZ FERNÁNDEZ, Profesor Titular de Análisis de Fundamentos del Análisis Económico de la Universidad de Granada.

AUTORIZAN:

La presentación y defensa pública de la tesis doctoral realizada bajo su dirección, "*Three essays on firm investment, trade credit, and exports*", de la que es autor D. JOSÉ MANUEL MANSILLA FERNÁNDEZ, puesto que reúne los requisitos formales y de contenido exigibles a un trabajo de esta naturaleza y es una investigación científica original, novedosa e innovadora.

Para que conste y surta los efectos oportunos firmamos la presente en Granada a 24 de abril de 2013.

Dr. Santiago Carbó Valverde   **Dr. Francisco Rodríguez Fernández**

AGRADECIMIENTOS

ACKNOWLEDGEMENTS

This thesis is the result of mi personal interest in the field of banking and corporate finance. I would like to dedicate a space of this dissertation to show my appreciation to those who, one way or another, have contributed to the completion of this work. I would like to express my gratitude to my thesis advisors, Prof. Santiago Carbó-Valverde and Prof. Francisco Rodríguez-Fernández, who have guided me with their teachings, support me, as well as guided me throughout this long way.

Similarly, I would like to give special thanks to Prof. John O.S. Wilson from the University of St. Andrews (Scotland, United Kingdom) for his appreciated comments and suggestions, as well as our interesting discussions on this research presented here during my research visiting in the summer of 2011. I hope this relationship will continue in the future. These acknowledgements also include Prof. Gregorio Núñez Romero-Balmas for having support me during my first years of research.

I would also like to reserve a place in this letter of acknowledges to my colleges with whom I have had the opportunity to exchange interesting discussions and comments on our research. This appreciation includes the whole comments, suggestions and discussions with participants in the conferences I had the opportunity to attend in the area of banking, corporate finance, and monetary policy.

I would also like to express my deepest gratitude to the Spanish Savings Banks Foundation (FUNCAS) for the time I was working there, and where I make great friendships that I maintain nowadays, and I hope to continue for many years. I will be always indebted to the Foundation for having received me with open arms from the first day, their confidence during all these years, and specially for giving me the opportunity to have belonged to a prestigious group.

Finally, I reserve a special and loving acknowledge to my family, my parents, Tomasita and Jose, my sisters, Beatriz and María de Tiscar, my maternal grandparents, Manuel and Atanasia, my paternal grandparents, Consuelo and María de Tiscar, and my girlfriend, Mar, for all the love, understanding, and do not have loosed my hand at any time during all this long way.

Thank you all,

José Manuel Mansilla-Fernández

Granada, October 2012

TABLE OF CONTENTS

Introduction

1. Introduction

The present doctoral dissertation includes three research papers on the area of banking and corporate finance. The main goal of this dissertation is threefold. The first research question attempts to solve whether bank market power constitutes a relevant topic in order to influence on bank lending availability and, therefore this fact could have influence on firm investment, and subsequently on economic growth. The second essay asks directly whether financial constraints, as well as liquidity management, are determinant on firm foreign sales activity. Finally, the third paper deals on the role of stance of monetary policy on the implicit interest rate and the amount of trade credit. In order to study deeply the research topics presented above, we offer a brief outline of the current situation, as a general framework of analysis, on the economic literature regarding bank market power, bank lending availability, monetary policy, trade credit, and firm exports.

1.1. The importance of the study of bank market structure and corporate finance

Financial literature has recognized that bank market structure plays a fundamental role for firms in order to find an adequate relationship with banks, and hence raise enough funds to carry out the subsequent investment in fixed assets. In this line, recent research has been mostly focused on the study of bank market concentration on the relationship between banks and firms, lenders and borrowers, and therefore on credit availability. One objective of this dissertation is a step further to extend the economic literature on industrial economics by seeking for direct relationship between bank market power and firm investment.

Recently, a few papers have tested the importance of bank market organization as a relevant factor of credit availability, in particular for SME (see Berger and Udell, 1998, 2002; Uchida *et al*., 2006), and hence as a determinant of firm access to finance, or even on the influence to access to other forms of financing as trade credit (see Fisman and Love, 2003; Fisman and Raturi, 2004; Petersen and Rajan, 1997). Other papers has tested that the causality between bank market structure and credit availability is closely related with informational rents (see Ogura, 2010, 2012; Petersen and Rajan, 1995).

In this dissertation, we discuss several positions which suggest that a strong competitive position could be beneficial for firm financing, but on the other hand, we have also find other arguments which advocates that bank competition reduces firm financial availability (see Berger, 1995; Berger and Udell, 2002; Berger and Black, 2011; Boot and Thakor, 2000; Carbó *et al*., 2009; Cetorelli and Gambera, 2001; Cetorelli, 2004; Elsas, 2005; Ogura, 2010, 2012; Sapienza, 2002; Scott and Dunkelberg, 2003, 2010; Zarutskie, 2006)[1]. In this way, Coccorese (2008) shows that banking consolidation and economic expansion tends to reduce the concentration in favour of competition. Agostino and Trivieri, (2008, 2010) find, for the Italian case, negative causality between bank concentration and firm access to bank finance, whilst Scott and Dunkelberg (2010) find that bank competition improves bank and non-bank financial availability. Canales and Nanda (forthcoming) analyses the effects of bank deregulation and competition on the volume and interest rate of bank loan offered to firms. The authors find that decentralized banks tend to grant more lending to firms, in particular to SME, increasing entrepreneurial activity, as well as attending to more favourable lending terms. Although financial institutions are able to offer more attractive terms to

---

[1] Berger *et al.* (2004) offer an extensive overview of the effects of bank concentration on firm financing, particularly for the case of SME financing, and future research agenda as well.

firm, they are also in a better position to select healthier firms and cut credit in areas where they have stronger market power.[2]

Research agenda has been expanded to include the analysis of bank market structure, competition and concentration, on bank-firm relationships, in particular placing greater emphasis on relationship lending. Closely related to this dissertation, financial literature offers sound arguments demonstrating that bank market power might be perceived as a tool to extract information of borrowers (see Ogura, 2010; 2012). The seminal works presented by Petersen and Rajan (1995, 2002) concludes that better information accession is not necessarily conditioned to hard information on borrowers' creditworthiness since this fact enables to banks to lend considering greater distance with respect to the firm without compromising their ability to underwrite or monitoring those credits. Petersen and Rajan (1994, 1995) provide the theoretical framework that determines that competition in credit markets and long-term relationships are not obligatory compatible, and banks are less able to retain borrowers, and increased bank market power has a positive influence on credit availability since lenders are able to capture a larger share of future loan interest surpluses from borrowers. [3] Dell'Ariccia (2000) shows that the effect of banking competition on screening could result some ambiguous resulting in a prisoner's dilemma in which banks should decide between relationship and transactional lending. Boot (2000) and Boot and Thakor (2000) show find the existence of the benefit that each bank gains investing in knowledge is decreasing as the rent increases, so the rent per unit of relationship lending

---

[2] Closely to this paper, Erel (2011) shows that after merger processes, market overlap increases cost savings, and therefore lowers the spreads, but when the overlap is large enough, spreads could be also increased by the effects of bank market power.

[3] This branch of financial literature has motivated numerous studies on the importance of the impact of bank-borrower distance on credit availability, loan pricing and borrower-lender performance (see Agarwal and Hauswald, 2006 , 2010; Berger and De Young, 2006; Brevoort and Hannan, 2006; De Young *et al.*, 2008, 2011; Degryse and Ongena, 2001, 2005; Uchida *et al.*, 2012).

decreases. Following this reasoning, financial literature has continued research agenda by showing that the value of bank market structure and lending relationships is also extensible to the number of relationships that each firm own with financial institutions (see Carbó *et al.*, 2012a; Degryse and Ongena, 2001; Kano *et al.*, 2011). Degryse *et al.* (2011) find that profitability is higher if the firm conserve only one single relationship with the bank. Carbó *et al.* (2012a) find that with more intense relationships throughout its length and lower number of banks enjoy greater credit availability and are less likely to be credit constrained, whilst Kano *et al.* (2011), based on Japanese data, find evidence that longer relationships are beneficial for borrowers and smaller banks in terms that this fact could reduce the cost of loans, as well as increase credit availability.[4]

Following this line of analysis, the most recent strand of financial literature find evidence of the existence of U-shaped effect of bank market concentration and bank firm-relationship (see Degryse and Ongena, 2007; Ralf Elsas, 2005; Ogura, 2010, 2012; Ongena *et al.*, 2012; Presbitero and Zazzaro, 2011). In this line, Elsas (2005) has shown that higher concentration in credit markets reduce the probability of a bank to assume the role of *Hausbank*. Degryse and Ongena (2007) find a non-monotonic effect of market concentration is robust to control for the presence of local credit markets of banks with multiple contacts. Presbitero and Zazzaro (2011) extend their analysis suggesting that this non-monotonicity can be explained by looking at the organizational level of local credit markets. Moreover, the authors provide evidence that a marginal increase in bank competition is in detrimental to relationship lending in markets where *Hausbank* are dominants. In this vein, Ongena *et al.* (2012) show that bank borrowing used to be concentrated in a *Hausbank* which pays an important role in determining

---

[4] See also Goddard and Wilson (2009) and Goddard *et al.* (2007, 2011) for a complete overview.

creditor concentration. Ogura (2010, 2012), using the price cost margin as a measure of market power, find that bank market power improves bank lending availability, in particular for SME, although in a second step of the research provides indirect evidence that bank market power is likely to be generated by relationship banking.

The whole arguments presented before show that competition in banking markets is a relevant factor in order to determine the relationships between banks and firms, as well as credit availability and the terms in which such credit is offered. The main research question formulated in the first essay is whether bank market power, and the subsequent credit availability, could be a determinant factor in order to decide firm investment in fixed assets in the short term and the long term. We find in financial literature arguments which demonstrate that bank market concentration exert certain influence on firm creation and investment (see Black and Strahan, 2002; Nicola Cetorelli, 2004; Cetorelli and Gambera, 2001; Cetorelli and Strahan, 2006; Degryse *et al.*, 2011; Bonaccorsi di Patti and Dell'Ariccia, 2004; Bonaccorsi Di Patti and Gobbi, 2007; Zarutskie, 2006). The results presented in the first essay demonstrate that bank market power exerts a negative influence on firm investment in the short term, but in the long term firm investment is recovered. In line with our results, Black and Strahan, (2002) find that bank market concentration reduce the creation of new firms. Moreover, Bonaccorsi di Patti and Dell'Ariccia (2004) find evidence that bank competition might result less favourable to the birth of new firms in industrial sector were informational asymmetries are more important. This argument is consistent with previous theoretical models that explicitly consider asymmetric information between lenders and borrowers, and predict that bank competition might reduce the availability of credit to more informational opaque firms. Rice and Strahan (2010) show that firms in more competitive environment are more likely to borrow from banks at a lower cost. In the

same way, Cetorelli (2004) finds evidence that changes on improving market competition lead to remove financial barriers to new firms, as well as could help to increase firm size in terms of added value or employment. Closely to the first essay, Bonaccorsi di Patti and Dell'Ariccia (2004) find that firms borrowing from banks involved in process of M&A have a higher investment rate after the merger. This result has been criticized by Degryse *et al.*, (2011) since Bonaccorsi di Patti and Dell'Ariccia (2004) fail to find large merge effects for bank dependent firms. On the other hand, Zarutskie (2006) finds evidence that in competitive environments younger firms invert less, suggesting that competition increases firm financing constraints, diminishing the effects in the long run.

1.2. The effects of financial constraints on liquidity management and foreign trade

Financial crisis has supposed a collapse in international trade from August 2008 until April 2009. In this line, a few papers have tested the coincidence between the great trade collapse and the global financial crisis and they show that the cut of bank credit is closely related with the downturn in international trade (see Ahn *et al.*, 2011; Alessandria *et al.*, 2010, 2011; Bems *et al.*, 2011; Bricongne *et al.*, 2012; Chor and Manova, 2012; Levchenko *et al.*, 2011; Manova, 2010; Manova *et al.*, 2011, among others). In this line, considering the consumer side, the global economy has also experimented a severe slowdown in demand which have clearly affected to international trade (see Manova, 2010). Based on this reasoning we propose in the second essay of this dissertation whether financial constraints could be an obstacle to become firm in export activities or even reduce the volume of foreign sales if the firm was already exporter.

Several authors recognize the importance of firm financial constraints on the volume of exports, in particular related to banking crisis. Moreover, The impact of banking crisis on exports constitutes a particular question for researchers and hence, economic literature has identified at least two reasons why exporters differ from other firms at the impact of production growth (see Amiti and Weinstein, 2011; Bricongne *et al.*, 2012; Chor and Manova, 2012; Iacovone and Zavacka, 2009; Park *et al.*, 2010, among others). First, operating in international markets could be considered as a sign of efficiency and competitiveness by domestic investors, therefore, in a context of financial markets imperfections, exporting could be interpreted as a signal of firm creditworthiness to external export (see Bernard and Jensen, 1995, 1999, 2004; Iacovone and Zavacka, 2009). This argument is reinforced by Campa and Shaver (2002) who show that investment is less sensitive to cash flow for the group of exporters compared to the group of non-exporters, which means that exporting could help firm to reduce financial constraints. Greenaway and Kneller, 2004, 2007; Greenaway *et al.*, 2005, 2007) find no evidence in favour the hypothesis of less constrained firms self-select into export activities. In this line, the argument that financial constraints impinge for exporters more that domestic firms gain relevance , even after considering the effects of banking crisis (see Amiti and Weinstein, 2011; Bellone *et al.*, 2010; Bricongne *et al.*, 2012; Chor and Manova, 2012; Greenaway and Kneller, 2007; Greenaway *et al.*, 2007; Manova, 2010; Manova *et al.*, 2011). Recent papers have shown similar evidence to those presented in the second essay of this dissertation. Bellone *et al.* (2010) employ as financial constraint measure a score index based on indirect measures related to some firm characteristics as well as liquidity ratio. In the same line, Bricongne *et al.* (2012) identify financially constrained firms if those have experienced a default on credits in the previous year. Payment incident can be regarded

as a generator of credit constraints since it could have a negative and significant impact on the amount of a new loan. The authors show that the impact of payment incidents during the crisis exerts a negative influence on the volume of firms' exports, compared to the exporting by the same group of firms before the crisis. To the best of our knowledge, the common point of previous studies is the use of indirect measures of financial constraints. The second essay employs survey data to obtain evidence whether the firm is financially constrained or not. More precisely, we use the BEEPS survey which ask to the entrepreneur whether the most recent loan application were always approved, sometimes approved or denied, or were always denied, among other interesting questions on the explicative reasons for why the loan has been denied and the collateral backed the loan.[5] In order to test the robustness of the results obtained for the survey data, we also construct a disequilibrium model based on parametric estimations based on Ogawa and Suzuki (2000), Atanasova and Wilson (2004), Atanasova (2007), Shikimi (2005), and Carbó *et al.* (2009).

The second reason is that exporting is associated with the need of external funding because of firms might finance sunk and fixed cost linked to incursion in foreign markets, making specific investments, market research, regulatory adaptation, and even set up and maintain its customer network (see Albornoz, forthcoming). Additionally, this reason justifies that exporters should also seek for working capital finance in foreign sales rather than domestic operations (see Bricongne *et al.*, 2012; Chor and Manova, 2012; Manova *et al.*, 2011; Manova, 2010; Djankov *et al.*, 2010). To solve liquidity constraints, firms ought to rely on bank financing or export letters of credit. Therefore, the second part of our research is motivated by the existing

---

[5] We consider the following three questions:
q47a: *If your firm does not currently have a loan, what was the reason?*
q47b: *If your firm did not apply for a loan, what were the main reasons?*
q47c: *If the loan application of your firm was rejected, what were the main reasons?*

relationship between firm export activities and liquidity management. Summarizing, we focus our attention both on external and internal trade finance. Several authors have related financial constraints with liquidity needs. The seminar papers presented by Fazzari *et al.* (1988) and Fazzari and Petersen (1993) demonstrate that financial constraints are related to cash flow sensitivities. This argument is in line with those presented by Kaplan and Zingales (1997, 2000) who suggest that higher cash flow sensitivity cannot be interpreted as evidence that a firm is financially constrained including in their sample 49 low dividends firms as financial constraints criterion, and Cleary (1999, 2006) demonstrates that cash flow sensitivity need not identify liquidity constrained firms. In particular, we also find authors whom establish that maintain certain level of liquidity is determinant especially when capital markets are imperfects (see Blanchard *et al.*, 1994; Kim *et al.*, 1998; Lins *et al.*, 2010; Yun, 2009). Closely related with the second essay of this dissertation, Bigelli and Sánchez-Vidal (2012) show that more cash is also held by firms with longer cash conversion cycles and lower financing deficits, as predicted by the hierarchy theory. The authors report evidence that dividend payments are associated with more cash holding, and bank debt and net working capital represent good cash substitutes.[6] Constrained firms also burned on through cash, and drew more heavily on lines of credit for fear banks would restrict credit access in the future, and sold more assets in to fund their operations (see Campello *et al.*, 2010). Chor and Manova (2012) show that credit condition play a determinant role as a channel through which the economic crisis affected trade volumes, as well as exports of more external financial vulnerable firms are more sensitive to the cost of external capital than exports of less vulnerable industries. This storyline

---

[6] See also Faulkender and Wang (2006) and Pinkowitz *et al.* (2006).

motivates the second question presented in the second essay of this dissertation. Could liquidity management constitute a determinant factor of firm exports?

1.3. The importance of the volume and the interest rate of trade credit

Once we have treated the importance of bank credit availability and firm investment in fixed assets and working capital, the third essay deals on the influence that movements in macroeconomic interest rates exert on the implicit interest rates, and the firm's balance sheet position, i.e. whether the firm are more interested to be net trade credit borrower or lender. Financial literature has shown that research on trade credit constitutes an interesting question, in particular during crisis times, because of delay on payments, or even lack of availability might be a route of contagion among firms, as well as supposes an increase of financial pressure that affects to investment decisions (see Carbó et al., 2012b). Trade credit permits to sellers delay the payment to their customers depending on the needs of the former and, on the other hand, customers are able to operate without liquidity restrictions (see Raddatz, 2006, 2010; Braun and Raddatz, 2008) although we have also shown authors who demonstrate that trade credit could be an expensive form of firm finance (see Carbó *et al.*, 2012b; Ng *et al.*, 1999).

Literature on monetary policy has traditionally been interested to study the *interest rate channel* which focuses the analysis on analysing movements of macroeconomic interest rates based on the adjustment of central banks targets over domestic bonds markets. Those changes are transmitted to the real sector and are responsible of the effects of the transmission of shocks on the real economy (see Clauss, 2011). This view has been largely extended to the role played by market imperfections in the transmission of monetary policy through the credit channel (see Romer and Romer, 1990, 1994; Hubbard, 1998). The existence of information asymmetry has as a

consequence that alternative types of financing cannot be used as perfect substitutes and the cost as well as the availability depends on firm's balance sheet (see Mateut, 2005; Mateut *et al.*, 2006). In this line, the Bernanke and Blinder's (1988) *bank lending channel* approach suggest that banks play an special role in the financial system because of they have an special advantage in processing information asymmetries (see Bernanke and Blinder, 1992; Bernanke and Gertler, 1995; Kashyap and Stein, 2000). In this way, Stein (1998) develops a model in which information problem make difficult to raise funds for banks. The main implication of the bank lending channel for firm's credit and investment are those related with an increase in the monetary policy would have a significant impact for firms more dependents on bank credit (see Kashyap and Stein, 2000). In contrast, Kashyap *et al.* (1993) show that tighter monetary policy leads to a shift in firm's mix of external financing: commercial paper rises in detriment of bank loans, and therefore, this fact reduces bank credit availability. Carbó and López (2009) show, using Spanish data, that whilst interest rates increases, then firms reduce their bank dependence, as well as increase liquidity. Huang (2003) and Huang *et al.* (2011) show that the dynamic behaviour of bank debt versus non-bank debt shows that the lending channel works through cutting back the loan supplies to small firms which suffer more than large firm because of does not have more alternatives of bank finance, consistent with the inventory behaviour.

To the extend that *bank lending channel* is declining in importance, the Bernanke and Gertler's (1995) *balance sheet channel* gain progressively relevance. The *balance sheet channel* arises from the presence of asymmetric information problems in credit markets. Important theoretical findings (see Diamond, 1984, 1991; Hoshi *et al.*, 1990, 1991); Bolton and Freixas, 2000; Repullo and Suarez, 2000) demonstrate that capital market imperfection conditions the access for firms in weak financial position.

Those models predict that in period of monetary tightening the weak financial firms have more difficult to access to bank credit. Bernanke and Gertler (1989, 1995) expose that a tightening in monetary policy damages firm financial creditworthiness, and as a consequence the firm's ability to raise funds from banks, or even other financial intermediaries, decreases as well. Following tight money, lending to small firms declines relative to lending to large firms.[7] Ashcraft (2006) and Ashcraft and Campello (2007) investigate whether borrowers' creditworthiness influences the response of bank lending to monetary policy. Those results are consistent with a demand-driven transmission mechanism that works through firms' balance sheet and is independent from the bank lending channel. Bougheas *et al.* (2006, 2009) find empirically that small, young, and risky firms are more significantly affected by tight monetary conditions. Nevertheless, the most recent strand of empirical literature is focused on the recent financial crisis showing that bank lending channel operates through bank risk. In this line, Altunbas *et al.* (2012) show that institutions with higher risk exposure had less capital, larger size, greater reliance on short-term market funding, and aggressive credit growth. Altunbas *et al.* (2010) show that bank risk plays an important role in determining banks' loan supply and in sheltering them from a tightening of monetary policy. Low-risk banks can better shield their lending from monetary tightening as they have better and easier access to fund raising. In particular, securitization used before the financial crisis has contributed broadly to modify the bank lending channel as well as banks' ability to grant credit as argued by Altunbas *et al.* (2009). The authors show that the use of securitization activity also reduces the effectiveness of monetary policy. Moreover, banks making a massive use of securitization tend to grant a higher amount of loans and this effect is stronger when the economy is in good shape.

---

[7] See also Black and Rosen (2007) who show that during periods of tight monetary policy, banks adjust their stocks of credit reducing the maturity of loans and reallocating their short-term loan supply for small firms to large firms.

Closely related with the third essay of this dissertation, *trade credit channel* approach might be viewed as another substitute for the *bank lending channel* approach. We find sound arguments in financial literature which advocates that during tight monetary policy small firms, as well as large firms unless with lower level of collateralized assets tend to increase the use of trade credit (see Nilsen, 2002). In the same way, Guariglia and Mateut (2006) and Mateut *et al.* (2006) find for UK data that firms uses simultaneously credit and trade credit channels during monetary contractions, but the former channel tend to weaken the first one, whilst Choi and Kim (2005) find a significant increase of the use of trade payables and receivables during monetary contractions. Those results are in line with those presented in this dissertation. One of the contributions of the third essay is that during monetary policy contractions firms increase the use of trade credit to the detriment of trade debit, which means that firms tend to became net trade borrowers rather than lenders. Additionally, Atanasova and Wilson (2003, 2004) find that during monetary contraction corporate demand for bank credit decreases, whereas the supply of bank loans also decreases.[8] Nevertheless, the results offered in the third essay show that a tightening in monetary policy leads to close bank financing and trade credit, at least whether we analyse in terms of *complementarity effect*. We find empirical evidence that in periods of monetary policy contractions bank lending and trade credit could be complementarity forms of firm financing. We also find in financial literature other authors advocating for the complementarity between the availability of bank lending and trade credit when financing credit constraint is imposed by financial institutions (see Petersen and Rajan, 1994, 1995, 1997; Danielson and Scott, 2004; Burkart and Ellingsen, 2004; Cull *et al.*, 2009; Giannetti *et al.*, 2011). Carbó *et al.* (2012b) find a significant sensitivity of the extension of trade credit to bank

---

[8] Ramey (1992) extends the theory of King and Plosser (1984) by recognizing that under certain conditions the co-movements between monetary policy and trade credit reveal the existence of underlying financial shock for most of the fluctuations in money at business cycles frequencies.

lending at unconstrained firms which suggest the role of lenders due to the easier access to bank lending. Love and Zaidi (2010) cannot find evidence that bank credit can be a substitute for trade credit in crisis times. On the other hand, we also find arguments in favour of substitutability between bank lending and trade credit. In this way, De Blasio (2005) and Fukuda *et al.* (2006) find evidence that bank lending and trade credit could be substitutes in period of tight money. Those results are consistent with those of Tsuruta (2007, 2010) find that the volume of trade credit is reduced in period of crises by suppliers, and Uesugi and Yamashiro (2008) find that trade credit and bank loans differ substantially in terms of creditors, and among credit instruments.

However, we also concerned to study the existence of *competition effect* between bank lending and trade credit. We compute a new indicator as the difference of the implicit interest rate paid for each firms minus the average implicit interest rate of the industry which the firm belongs to. We find that a tightening in monetary policy tends to create divergence among the diverse implicit interest rate paid by firms in the same sector. This effect might be the results of the increasing cost of trade credit.

2. Contribution of the essays

The review presented above serves as introduction of the essays presented in this dissertation. The next section presents a brief outline of the main contributions of each paper.

2.1. Essay I: Bank market power and short term and long term firm investment

This paper investigates the effects of bank market power on firm investment rate considering the short and long term. To our knowledge, this is the first paper to propose

that bank market structure might influence on firm investment decisions. We construct a novel database in which we combine firm level information from Bureau van Dijk's SABI (2010), bank level data from the financial statement provided by the Spanish Banking Association (AEB) for commercial banks, Spanish Savings Banks Association (CECA) for savings banks, and National Union of Credit Cooperatives (UNACC) for cooperatives banks.

The contribution of this paper is fourfold: (i) bank market power exert negative influence in firm investment rate on the short run; (ii) the effects of bank market power is greater for the short run than for the long run, and the investment rate is recovered on the long run. The results are robust when we employ alternative investment variables as growth of assets or investment over assets, or even we substitute the Lerner index for measures of bank loan concentration; (iii) we also perform Granger causality test to demonstrate the existence of directional causality between bank market power and firm investment. We find that bank market power causes firm investment, but not the opposite side, and finally, (iv) we also find the existence of cash flow sensitivity to investment considering bank market power environment, in particular, we find evidence for SME rather than the larger ones, which means that bank market becomes SME more conservatives in the short run but this effect could be relaxed.

2.2. Essay II: Firm exports, liquidity management, and financial constraints

The goal of this paper is twofold. We are concerned to study the relationship between the lack of credit availability on the firm export condition, as well as the percentage of sales volume that firm designates to foreign customers, i.e. the intensive margin. We also attempt to determine whether the firm's corporate liquidity management, measured as the length of time that firm manages its working capital

represented by two indexes: the cash conversion cycle and the net trade cycle is an influent factor on firm exports.

The dataset used in this essay is taken from the 2009 version of the Business Environment and Enterprise Performance Survey (BEEPS) developed jointly by the World Bank and the European Bank for Reconstruction and Development. We include in our sample 3,354 firms from Greece, Germany, Ireland, Portugal, and Spain. The questionnaire also includes information related to firms' balance sheets and income statement data, as well as on financial products and services employed in firm financing e.g. checking account, credit and debit card use, or line of credits. Additionally, the survey includes a broad sets of questions related to information related to the access to external capital markets and financial constraints.

The contribution of this essay is twofold: (i) we find that that credit constraints constitutes and obstacle to firm both in the side of export condition, i.e. in the extensive margin, and in the volume of sales designated to exports, i.e. the intensive margin. We obtained those results employing a twofold criterion of financial constraints. On the one hand, we construct a dummy variable constructed from the questionnaire responses which represents if the firm is financially constrained or not. We check the robustness of our result estimating a disequilibrium model, and moreover, we find that there exists a strong explaining power comparing for both methodologies. (ii) Regarding to liquidity management, our results also suggest that liquidity management constitutes a relevant factor for firms in order to start exporting. We also find that longer trade credit cycles, increases the probability of being an exporter firm and, furthermore the amount of foreign sales is also increasing. Moreover, we are concerned to study deeply the causes of the direction of cash conversion cycle, hence we emphasize the different components

of the indicators and we conclude that collection period and inventory period influence positively on exports, whilst credit period shows the opposite effect.

2.3. Essay III: Monetary policy, implicit interest rates, and relative net trade credit

Research on trade credit constitutes an important question since becomes more relevant in crisis times, since a delay or delinquency, or even lack of availability suppose an increase in financial pressure for firms in order to affect investment decisions. Economic literature has traditionally focused to study the effects of monetary policy on the bank interest rates and credit availability, even considering the trade credit channel as a substitute of bank lending channel. Then, we propose in this paper the following two research questions: (i) Can decisions in monetary policy be transmitted to implicit interest rates of trade credit? and (ii) Do increasing interest rates have repercussion on firms to become trade creditor or trade lender?

The contribution of this essay is also fourfold: (i) we construct a new measure to proxy for the implicit interest rate of trade credit by considering firm financial expenses extracted interest rate expenses paid for other forms of financing. We find that a tightening in monetary policy is translated into a more expensive trade credit financing. (ii) In addition, we investigate the effect of a tightening in monetary policy on the firm trade financing behaviour. We also construct a new ratio in order to measure the relative weight of trade credit or trade debit in the firm's current assets: the relative net trade credit. To the best of our knowledge, this is the first paper to employ a relative measure of defined within a homogeneous rank. Therefore, this new index could be also considered as contribution to methodology, since we compute the ratio scaling by the total amount of trade financing which help to mitigate the problem of comparability

between firms. Focusing on our empirical results, we find that a rising in interest rates conducts to skew the balance on the trade credit side, i.e. firms are more likely to become in trade credit borrowers. (iii) Examining the effect of monetary policy of the competition effect, we do find that raising interest rates leads to an increase in the distance between the implicit interest rate and the average interest rate for the industrial sector which the firm belongs to. And finally, (iv) regarding to the complementarity effect, we also do find that the differential between the implicit interest rate and the cost of bank financing is closer according as monetary policy is increasing. Those results suggest the existence of complementarity effect between trade credit and the cost of bank financing in an increasing interest rate environment.

References
(Introduction section)

Agarwal, Sumit and Robert Hauswald. 2010. Distance and Private Information in Lending. Review of Financial Studies 23, 2757-2788.

Agarwal, Sumit and Robert Hauswald. 2006. Distance and Information Asymmetries in Lending Decisions. Mimeo.

Agostino, Mariarosaria and Francesco Trivieri. 2010. Is Banking Competition Beneficial to SME? an Empirical Study Based on Italian Data. Small Business Economics 35, 335-355.

Agostino, Mariarosaria and Francesco Trivieri. 2008. Banking Competition and SMEs Bank Financing. Evidence from Italian Provinces. Journal of Industrial Competition and Trade 8, 33-53.

Ahn, JaeBin; Mary Amiti and David E. Weinstein. 2011. Trade Finance and the Great Trade Collapse. American Economic Review 101, 298-302.

Albornoz, Facundo; Héctor F. Calvo Pardo; Gregory Corcos and Emanuel Ornelas, forthcoming. Sequential Exporting. Journal of International Economics .

Alessandria, George; Joseph P. Kaboski and Virgiliu Midrigan. 2011. US Trade and Inventory Dynamics. American Economic Review 101, 303-307.

Alessandria, George; Joseph P. Kaboski and Virgiliu Midrigan. 2010. The Great Trade Collapse of 2008-09: An Inventory Adjustment? IMF Economic Review 58, 254-294.

Altunbas, Yener; Leonardo Gambacorta and David Marques-Ibanez. 2010. Bank Risk and Monetary Policy. Journal of Financial Stability 6, 121-129.

Altunbas, Yener; Leonardo Gambacorta and David Marques-Ibanez. 2009. Securitisation and the Bank Lending Channel. European Economic Review 53, 996-1009.

Altunbas, Yener; Simone Manganelli and David Marques-Ibanez. 2012. Bank Risk During the Financial Crisis: Do Business Models Matter? Bangor Business School. Working Paper BBSWP/12/003.

Amiti, Mary and David E. Weinstein. 2011. Exports and Financial Shocks. The Quarterly Journal of Economics 126, 1841-1877.

Ashcraft, Adam B. 2006. New Evidence on the Lending Channel. Journal of Money, Credit, and Banking 38, 751-775.

Ashcraft, Adam B. and Murillo Campello. 2007. Firm Balance Sheets and Monetary Policy Transmission. Journal of Monetary Economics 54, 1515-1528.

Atanasova, Christina V. 2007. Access to Institutional Finance and the use of Trade Credit. Financial Management 36, 49-67.

Atanasova, Christina V. and Nicholas Wilson. 2004. Disequilibrium in the UK Corporate Loan Market. Journal of Banking and Finance 28, 595-614.

Atanasova, Christina V. and Nicholas Wilson. 2003. Borrowing Constraints and the Demand for Trade Credit: Evidence from UK Panel Data. Managerial and Decision Economics 24, 503-514.

Bellone, Flora; Patrick Musso; Lionel Nesta and Stefano Schiavo. 2010. Financial Constraints and Firm Export Behaviour. World Economy 33, 347-373.

Bems, Rudolfs; Robert C. Johnson and Kei-Mu Yi. 2011. Vertical Linkages and the Collapse of Global Trade. American Economic Review 101, 308-312.

Berger, Allen N. 1995. The Profit-Structure Relationship in Banking . Test for Market-Power and Efficient Structure Hypotheses. Journal of Money, Credit, and Banking 27, 404-431.

Berger, Allen N. and Lamont K. Black. 2011. Bank Size, Lending Technologies, and Small Business Finance. Journal of Banking and Finance 35, .

Berger, Allen N. and Robert De Young. 2006. Technological Progress and the Geographic Expansion of Commercial Banks. Journal of Money, Credit and Banking 38, 1483-1513.

Berger, Allen N. and Gregory F. Udell. 2002. Small Business Credit Availability and Relationship Lending: The Importance of Bank Organisatinal Structure. Economic Journal 112, 32-53.

Berger, Allen N. and Gregory F. Udell. 1998. The Economics of Small Business Finance: The Role of Private Equity and Debt Markets in the Financial Growth Cycle. Journal of Banking and Finance 22, 613-673.

Berger, Allen N.; Asli Demirgüç-Kunt; Ross Levine and Joseph G. Haubrich. 2004. Bank Concentration and Competition: An Evolution in the Making. Journal of Money, Credit and Banking. 36, 433-451.

Bernanke, Ben S. and Alan S. Blinder. 1992. The Federal Funds Rate and the Channels of Monetary Transmission. American Economic Review 82, 901-921.

Bernanke, Ben S. and Alan S. Blinder. 1988. Credit, Money, and Aggregate Demand. American Economic Review 78, 435-439.

Bernanke, Ben S. and Mark Gertler. 1995. Inside the Black Box: The Credit Channel of Monetary Policy Transmission. Journal of Economic Perspectives 9, 27-48.

Bernanke, Ben S. and Mark Gertler. 1989. Agency Cost, Net Worth, and Business Fluctuations. American Economic Review 79, 14-31.

Bernard, Andrew B. and J. Bradford Jensen. 2004. Why some Firms Export. Review of Economics and Statistics 86, 561-569.

Bernard, Andrew B. and J. Bradford Jensen. 1999. Exceptional Exporters Performance: Cause, Effect, Or both? Journal of International Economics 47, 1-25.

Bernard, Andrew B. and J. Bradford Jensen. 1995. Exporters, Jobs, and Wages in US Manufacturing: 1976-1987. Booking Papers on Economic Activity, Microeconomics 67-119.

Bigelli, Marco and Javier Sánchez-Vidal. 2012. Cash Holdings in Private Firms. Journal of Banking & Finance 36, 26-35.

Black, Lamont K. and Richard J. Rosen. 2007. How the Credit Channel Works: Differentiating the Bank Lending Channel and the Balance Sheet Channel.

Black, Sandra E. and Philip E. Strahan. 2002. Entrepeneurship and Black Credit Availability. Journal of Finance 57, 2807-2833.

Blanchard, Olivier J.; Florencio Lopez-de-Silanes and Andrei Shleifer. 1994. What do Firms do with Cash Windfalls? Journal of Financial Economics 36, 337-360.

Bolton, Patrick and Xabier Freixas. 2000. Equity, Bonds, and Bank Debt: Capital Structure and Financial Market Equilibrium Under Asymmetric Information. Journal of Political Economy 108, 324-351.

Bonaccorsi di Patti, Emilia and Giovanni Dell'Ariccia. 2004. Bank Competition and Firm Creation. Journal of Money, Credit and Banking 36, 225-251.

Bonaccorsi di Patti, Emilia and Giorgio Gobbi. 2007. Winners or Losers? The Effects of Banking Consolidation on Corporate Borrowers. The Journal of Finance 62, 669-695.

Boot, Arnoud W. A. 2000. Relationship Banking: What do we Know? Journal of Financial Intermediation 9, 7-25.

Boot, Arnoud W. A. and Anjan V. Thakor. 2000. Can Relationship Banking Survive Competition? Journal of Finance 55, 679-713.

Bougheas, Spiros; Simona Mateut and Paul Mizen. 2009. Corporate Trade Credit and Inventories: New Evidence of a Trade-Off from Accounts Payable and Receivable. Journal of Banking and Finance 33, 300-307.

Bougheas, Spiros; Paul Mizen and Cihan Yalcin. 2006. Access to External Finance: Theory and Evidence on the Impact of Monetary Policy and Firm-Specific Charasteristics. Journal of Banking and Finance 30, 199-227.

Braun, Matias and Claudio Raddatz. 2008. Politics of Financial Development: Evidence from Trade Liberalization. Journal of Finance 63, 1469-1508.

Brevoort, Kenneth P. and Timothy H. Hannan. 2006. Commercial Lending and Distance: Evidence from Community Reinvestment Act Data. Journal of Money, Credit, and Banking 38, 1991-2012.

Bricongne, Jean-Charles; Lionel Fontagné; Guillaume Gaulier; Daria Taglioni and Vincent Vicard. 2012. Firms and the Global Crisis: French Exports in the Turmoil. Journal of International Economics 87, 134-146.

Burkart, Mike and Tore Ellingsen. 2004. In-Kind Finance: A Theory of Trade Credit. American Economic Review 94, 569-590.

Campa, José Manuel and J. Myles Shaver. 2002. Exporting and Capital Investment: On the Strategic Behavior of Exporters. Research Paper No. 469.

Campello, Murillo; John R. Graham and Campbell R. Harvey. 2010. The Real Effects of Financial Cosntraints: Evidence from a Financial Crisis. Journal of Financial Economics 97, 470-487.

Canales, Rodrigo and Ramana Nanda. forthcoming. A Darker Side to Decentralized Banks: Market Power and Credit Rationing in SME Lending. Journal of Financial Economics.

Carbó, Santiago and Rafael López. 2009. Bank-Lending Channel and Non-Financial Firms: Evidence for Spain. Spanish Economic Review 11, 125-140.

Carbó, Santiago; Hans Degryse and Francisco Rodriguez. 2012a. Lending Relationships and Credit Rationing: The Impact of Securitization. Mimeo.

Carbó, Santiago; Francisco Rodriguez and Gregory F. Udell. 2012b. Trade credit, the financial crisis and firms' access to finance. Mimeo.

Carbó, Santiago; Francisco Rodriguez and Gregory F. Udell. 2009. Bank Market Power and SME Financing Constraints. Review of Finance 13, 309-340.

Cetorelli, Nicola. 2004. Real Effects of Bank Competition. Journal of Money, Credit and Banking 36, 543-558.

Cetorelli, Nicola and Philip E. Strahan. 2006. Finance as a Barrier to Entry: Bank Competition and Industry Structure in Local U.S. Markets. Journal of Finance. 61, 437-461.

Cetorelli, Nicola and Michele Gambera. 2001. Banking Market Structure, Financial Dependence and Growth: International Evidence from Industry Data. Journal of Finance 56, 617-648.

Choi, Woon Gyu and Yungsan Kim. 2005. Trade Credit and the Effect of Monetary Macro-Financial Shocks: Evidence from U.S. Panel Data. Journal of Financial and Quantitative Analysis 40, 897-925.

Chor, Davin and Kalina Manova. 2012. Off the Cliff and Back? Credit Conditions and International Trade during the Global Financial Crisis. Journal of International Economics 87, 117-133.

Clauss, Iris. 2011. Inside the Black Box: How Important is the Credit Channel Relative to the Interest and Exchange Rate Channels? Economic Modelling 28, 1-12.

Cleary, Sean. 2006. International Corporate Investment and the Relationship between Financial Constraint Measures. Journal of Banking and Finance 30, 1559-1580.

Cleary, Sean. 1999. Relationship between Firm Investment and Financial Status. Journal of Finance 54, 673-692.

Coccorese, Paolo. 2008. An Investigation on the Causal Relationship between Banking Concentration and Economic Growth. International Review of Financial Analysis 17, 557-570.

Cull, Robert; Lixin Collin Xu and Tian Zhu. 2009. Formal Finance and Trade Credit during China's Transition. Journal of Financial Intermediation 18, 173-192.

Danielson, Morris G. and Jonathan A. Scott. 2004. Bank Loan Availability and Trade Credit Demand. Financial Review 39, 579-600.

De Blasio, Guido. 2005. Does Trade Credit Substitute for Bank Credit? Evidence from Firm-Level Data. Economic Notes 34, 85-112.

De Young, Robert; Dennis Glennon and Peter Nigro. 2008. Borrower-Lender Distance, Credit Scoring, and Loan Performance: Evidence from International-Opaque Small Business Borrowers. Journal of Financial Intermediation. 17, 113-143.

De Young, Robert; W. S. Frame; Dennis Glennon and Peter Nigro. 2011. The Information Revolution and Small Business Lending: The Missing Evidence. Journal of Financial Services Research 1-2, 19-33.

Degryse, Hans and Steven Ongena. 2007. The Impact of Competition on Bank Orientation. Journal of Financial Intermediation 16, 399-424.

Degryse, Hans and Steven Ongena. 2005. Distance, Lending Relationships, and Competition. Journal of Finance 60, 231-266.

Degryse, Hans and Steven Ongena. 2001. Bank Relationships and Firm Profitability. Financial Management 30, 9-34.

Degryse, Hans; Nancy Masschelein and Janet Mitchell. 2011. Staying, Dropping, Or Switching: The Impacts of Bank Mergers on Small Firms. Review of Financial Studies 24, 1102-1140.

Dell'Ariccia, Giovanni. 2000. Learning by Lending, Competition and Screening Incentives in the Banking Industry. Center for Financial Institutions Working Paper 00-10.

Diamond, Douglass W. 1991. Monitoring and Reputation: The Choice between Bank Loans and Directly Placed Debt. Journal of Political Economy 99, 689-721.

Diamond, Douglass W. 1984. Financial Intermediation and Delegated Monitoring. Review of Economic Studies 51, 393-414.

Elsas, Ralf. 2005. Empirical Determinants of Relationship Lending. Journal of Financial Intermediation 14, 32-57.

Erel, Isil. 2011. The Effect of Bank Mergers on Loan Prices: Evidence from the United States. Review of Financial Studies 24, 1068-1101.

Faulkender, Michael and Rong Wang. 2006. Corporate Financial Policy and the Value of Cash. Journal of Finance 61, 1957-1990.

Fazzari, Steven M. and Bruce C. Petersen. 1993. Working Capital and Fixed Investment: New Evidence on Financing Constraints. RAND Journal of Economics 24, 328-342.

Fazzari, Steven M.; R. Glenn Hubbard and Bruce C. Petersen. 1988. Financing Constraints and Corporate Investment. Brooking Papers on Economic Activity. 1, 141-206.

Fisman, Raimond and Inessa Love. 2003. Trade Credit, Financial Intermediary Development, and Industry Growth. Journal of Finance. 58, 353-374.

Fisman, Raymond and Mayank Raturi. 2004. Does Competition Encourage Credit Provision? Evidence from African Trade Credit Relationships. Review of Economics and Statistics 86, 345-352.

Fukuda, Shin-ichi; Munehisa Kayusa and Kentaro Akashi. 2006. The Role of Trade Credit for Small Firms: An Implication for Japan's Banking Crisis. Center for Advanced Research in Finance, University of Tokyo CARF-F-078.

Giannetti, Mariassunta; Mike Burkart and Tore Ellingsen. 2011. What You Sell is what You Lend? Explaining Trade Credit Contracts. Review of Financial Studies 24, 1261-1298.

Goddard, John and John O. S. Wilson. 2009. Competition in Banking: A Disequilibrium Approach. Journal of Banking & Finance 33, 2282-2292.

Goddard, John; Hong Liu; Philip Molyneux and John O. S. Wilson. 2011. The Persistence of Bank Profit. Journal of Banking & Finance 35, 2881-2890.

Goddard, John; Philip Molyneux; John O. S. Wilson and Manouche Tavakoli. 2007. European Banking: An Overview. Journal of Banking and Finance. 31, 1911-1935.

Greenaway, David and Richard Kneller. 2007. Industry Differences in the Effect of Export Market Entry: Learning by Exporting? Review of World Economics 143, 416-432.

Greenaway, David and Richard Kneller. 2004. Exporting and Productivity in the United Kingdom. Oxford Review of Economic Policy 20, 358-371.

Greenaway; David; Alessandra Guariglia and Kneller Richard. 2007. Financial Factors and Exporting Decisions. Journal of International Economics 73, 377-395.

Greenaway, David; Joakim Gullstrand and Richard Kneller. 2005. Exporting may no always Boost Firm Productivity. Review of World Economic 141, 561-582.

Guariglia, Alessandra and Simona Mateut. 2006. Credit Channel, Trade Credit Channel, and Inventory Investment: Evidence from a Panel of UK Firms. Journal of Banking and Finance 30, 2835-2856.

Hoshi, Takeo; Anil Kashyap and David Scharftein. 1991. Corporate Structure, Liquidity, and Investment: Evidence from Japanese Industrial Groups. Quarterly Journal of Economics 106, 33-60.

Hoshi, Takeo; Anil Kashyap and David Scharftein. 1990. The Role of Banks in Reducing the Cost of Financial Distress in Japan. Journal of Financial Economics 27, 67-88.

Huang, Hui; Shi Xiaojun and Shunming Zhang. 2011. Counter-Cyclical Substitution between Trade Credit and Bank Credit. Journal of Banking and Finance Forthcoming, .

Huang, Zhangkai. 2003. Evidence of a Bank Lending Channel in the UK. Journal of Banking and Finance 27, 491-510.

Hubbard, R. Glenn. 1998. Capital-Market Imperfections and Investment. Journal of Economic Literature 36, 193-225.

Iacovone, Leonardo and Veronica Zavacka. 2009. Banking Crises and Exports. Lessons from the Past. The Word Bank Policy Research Working Paper 5016.

Kano, Masaji; Hirofumi Uchida; Gregory F. Udell and Wako Watanabe. 2011. Information Verifiability, Bank Organization, Bank Competition and Bank-Borrower Relationships. Journal of Banking and Finance 35, 935-954.

Kaplan, Steven N. and Luigi Zingales. 2000. Investment-Cash Flow Sensitivities are Not Valid Measures of Financing Constraints. Quarterly Journal of Economics 115, 707-712.

Kaplan, Steven N. and Luigi Zingales. 1997. Do Investment-Cash Flow Sensivities Provide Useful Measures of Financing Constraint? The Quarterly Journal of Economics. 112, 169-215.

Kashyap, Anil K. and Jeremy C. Stein. 2000. What do a Million Observations Banks Say about the Transmission of Monetary Policy? American Economic Review 90, 407-428.

Kashyap, Anil K.; Jeremy C. Stein and David W. Wilcox. 1993. Monetary Policy and Credit Conditions: Evidence from the Composition of External Finance. American Economic Review 83, 78-98.

Kim, C. S.; D. Mauer and A. Sherman. 1998. The Deteminants of Corporate Liquidity: Theory and Evidence. Journal of Financial and Quantitative Analysis 33, 335-359.

King, Robert G. and Charles I. Plosser. 1984. Money, Credit, and Prices in a Real Business Cycle. American Economic Review 74, 363-380.

Levchenko, Andrei A.; Logan T. Lewis and Linda L. Tesar. 2011. The "Collapse in Quality" Hypothesis. American Economic Review 101, 293-297.

Lins, Karl V.; Henri Servaes and Peter Tufano. 2010. What Drives Corporate Liquidity? an International Survey of Cash Holdings and Line of Credit. Journal of Financial Economics 98, 160-176.

Love, Inessa and Rida Zaidi. 2010. Trade Credit, Bank Credit, and Financial Crisis. International Review of Finance 10, 125-147.

Manova, Kalina. 2010. Credit Constraints, Heterogeneous Firms, and International Trade. NBER Working Paper 14531.

Manova, Kalina; Shang-Jin Wei and Zhiwei Zhan. 2011. Firm Exports and Multinational Activity under Credit Constraints. NBER Working Paper 16905.

Mateut, Simona. 2005. Trade Credit and Monetary Policy Transmission. Journal of Economic Surveys 19, 655-670.

Mateut, Simona; Spiros Bougheas and Paul Mizen. 2006. Trade Credit, Bank Lending and Monetary Policy Transmission. European Economic Review 50, 603-629.

Ng, Chee K.; Janet Kiholm Smith and Richard L. Smith. 1999. Evidence on the Determinants of Credit Terms used in Interfirm Trade. Journal of Finance 54, 1109-1129.

Nilsen, Jeffrey H. 2002. Trade Credit and Bank Lending Channel. Journal of Money, Credit, and Banking 34, 226-253.

Ogawa, K. and K. Suzuki. 2000. Uncertainty and Investment: Some Evidence from the Panel Data of Japanese Manufacturing Firms. Japanese Economic Review 51, 170-192.

Ogura, Yoshiaki. 2012. Lending Competition and Credit Availability for New Firms: Empirical Study with the Price Cost Margin in Regional Loan Markets. Journal of Banking & Finance 36, 1822-1838.

Ogura, Yoshiaki. 2010. Interbank Competition and Information Production: Evidence from the Interest Rate Difference. Journal of Financial Intermediation 19, 279-304.

Ongena, Steven; Günseli Tümer-Alkan and Natalja v. Westernhagen. 2012. Creditor Concentration: An Empirical Investigation. European Economic Review 56, 830-847.

Park, Albert; Dean Yang; Xinzheng Shi and Yuan Jiang. 2010. Exporting and Firm Performance: Chinese Exporters and the Asian Financial Crisis. The review of economics and statistics 92, 822-842.

Petersen, Mitchell A. and Raghuram G. Rajan. 2002. Does Distance Still Matters? the Information Revolution in Small Business Lending. Journal of Finance 57, 2533-2570.

Petersen, Mitchell A. and Raghuram G. Rajan. 1997. Trade Credit: Theories and Evidence. Review of Financial Economics. 10, 226-253.

Petersen, Mitchell A. and Raghuram G. Rajan. 1995. The Effect of Credit Market Competition on Lending Relationships. Quarterly Journal of Economics. 110, 407-443.

Petersen, Mitchell A. and Raghuram G. Rajan. 1994. The Benefits of Lending Relationships: Evidence from Small Business Data. Journal of Finance. 49, 3-37.

Pinkowitz, L.; R. Stulz and R. Williamson. 2006. Does the Contribution of Corporate Cash Holdings and Dividends to Firms Value Dependent to Firms Value Depend on Governance? A Cross-Country Analysis. Journal of Finance 61, 2725-2751.

Presbitero, Andrea F. and Alberto Zazzaro. 2011. Competition and Relationship Lending: Friends Or Foes? Journal of Financial Intermediation 20, 387-413.

Raddatz, Claudio. 2010. Credit Chains and Sectoral Comovement: Does the Use of Trade Credit Amplify Sectoral Shocks? The Review of Economics and Statistics 92, 985-1003.

Raddatz, Claudio. 2006. Liquidity Needs and Vulnerability to Financial Underdevelopment. Journal of Financial Economics 80, 677-722.

Ramey, Valerie A. 1992. The Source of Financial Fluctuations in Money: Evidence from Trade Credit. Journal of Monetary Economics 30, 171-193.

Repullo, Rafael and Javier Suarez. 2000. Entrepeneurial Moral Hazard and Bank Monitoring: A Model of the Credit Channel. European Economic Review 44, 1931-1950.

Rice, Tara and Phillip E. Strahan. 2010. Does Credit Competition Affect Small-Firm Finance? Journal of Finance 65, 861-889.

Romer, Christina D. and David H. Romer. 1994. Monetary Policy Matters. Journal of Monetary Economics 34, 75-88.

Romer, Christina D. and David H. Romer. 1990. New Evidence on the Monetary Transmission Mechanism. Brookings Papers on Economic Activity 1, 149-213.

Sapienza, Paola. 2002. The Effects of Banking Mergers on Loan Contracts. Journal of Finance 57, 329-367.

Scott, Jonathan A. and William C. Dunkelberg. 2010. Competition for Small Firms Banking Business: Bank Actions Versus Market Structure. Journal of Banking and Finance 34, 2788-2800.

Scott, Jonathan A. and William C. Dunkelberg. 2003. Bank Mergers and Small Firm Financing. Journal of Money, Credit and Banking 35, 999-1017.

Shikimi, Masayo. 2005. Do Firms Benefit from Multiple Banking Relationships? Evidence from Small and Medium-Sized Firms in Japan. Discussion Papers Series No. 70.

Simeon Djankov; Caroline Freund and Cong S. Pham. 2010. Trading on Time. The Review of Economics and Statistics 92, 166-173.

Stein, Jeremy C. 1998. An Adverse-Selection Model of Bank Asset and Liability Management with Implication for the Transmission of Monetary Policy. RAND Journal of Economics 29, 466-486.

Tsuruta, Daisuke. 2010. How does Small Businesses Finance their Growth Opportunities? the Case of Recovery from the Lost Decade in Japan.

Tsuruta, Daisuke. 2007. Credit Contagion and Trade Credit Supply: Evidence from Small Business Data in Japan.

Uchida, Hirofumi; Gregory F. Udell and Wako Watanabe. 2006. Are Trade Creditors Relationship Lenders? RIETI Discussion Papers 06026.

Uchida, Hirofumi; Gregory F. Udell and Nobuyoshi Yamori. 2012. Loan Officers and Relationship Lending to SMEs. Journal of Financial Intermediation 21, 97-122.

Uesugi, Iichiro and Guy M. Yamashiro. 2008. How Trade Credit Differs from Loans: Evidence from Japanese Trading Companies. RIETI Discussion Papers 04028.

Yun, Hayong. 2009. The Choice of Corporate Liquidity and Corporate Governance. Review of Financial Studies 22, 1447-1475.

Zarutskie, Rebecca. 2006. Evidence on the Effects on Bank Competititon on Firms Borrowing and Investment. Journal of Financial Economics 81, 503-537.

Essay I:
Bank market power and short term
and long term firm investment

Bank market power and short term and long term firm investment

This paper investigates the effects of bank market power on firm credit availability, and therefore on firm investment considering the short and the long term. Our results suggest that an increase in bank market power reduce the firm investment on the short term, but on the long term firm investment tends to recovery. We extend the analysis by performing Granger causality test, and we find that bank market power influences on firm investment, but not the opposite side. Finally, we also show that cash flow is sensitive to bank market power for small and medium enterprises (96 words).

1. Introduction and motivation

Bank market structure constitutes one of the most relevant questions for firms to find an adequate relationship with banks, and therefore to carry out the subsequent investment in fixed assets. The nature of the main implications of bank market structure for firm financing have been subject to a large strand of theoretical and empirical financial literature, but recent research has been mostly focused on analysing the effects of bank market concentration on bank-firm relationships, and credit availability. This paper attempts to go one step forward by extending financial literature to firm investment and economic growth.

Recently, a few papers have tested, the most part of them by using measures of market concentration rather than strictly market power, that the existing relationship between bank concentration and credit availability is closely related with the creation of informational rents (Ogura, 2010, 2012; Petersen and Rajan, 1995), jointly with other studies finding positive association with relationship lending by investing specific resources in the relationships with borrowers (see Berger, 1995; Boot and Thakor, 2000; Degryse and Ongena, 2007; Elsas, 2005; Presbitero and Zazzaro, 2011). By contrast, we also find other studies advocating for the opposite results, suggesting that in more competitive environments the relationship between banks and firms would be damaged, and then banks' investment in soft-information would be also scratched (see Degryse and Cayseele, 2000; Degryse and Ongena, 2001; Degryse *et al.*, 2011; Farinha and Santos, 2002; Canales and Nanda, forthcoming). In conclusion, the financial literature finds solid theoretical foundations demonstrating that the composition of bank market structure determinates the relationship between banks and firms, and thus on lending technologies, and finally on credit availability. In this way, (see Carbó *et al.*, 2009) extend the literature and show that bank market power could reduce bank lending

availability and therefore create financial constraints for small and medium enterprises (SME hereafter). Furthermore, empirical evidence shows, that bank market concentration is a reduction factor for the creation of new firms by reduction of credit availability (Black and Strahan, 2002; Bonaccorsi di Patti and Dell'Ariccia, 2004; Bonaccorsi di Patti and Gobbi, 2004, 2007). Cetorelli (2004) and Cetorelli and Strahan (2006) find evidence that bank market concentration reduces firm size, as well as Degryse *et al.* (2011) complete this analysis by introducing the long term effects of bank concentration, and they find evidence of discontinuation and even drop in the relationship banks and firms after mergers. Other recent studies extend the analysis suggesting that bank concentration leads to an increase on spreads (Panetta *et al.*, 2009; Canales and Nanda, forthcoming), and therefore on the cost of firm financing.

We extend the existing studies in four ways. First, since financial literature has extensively shown that bank market concentration leads to a reduction of bank credit availability, and hence financial constraints. We propose in this paper that this effect could be prolonged to a reduction of firm investment, especially considering tangible assets. Second, we also extend financial literature by analysing the effects of bank market power on the short term and the long term. In addition, the most part of authors used to base their conclusions in concentration measures, e.g. HHI or CRn; in this paper, we employ the Lerner index as first measure of bank market power since we consider that this index is the most appropriated of market power following the most recent industrial organization literature (see Carbó *et al.*, 2009). Moreover, we also extend our analysis by performing Granger causality test to demonstrate the existence of directional causality between bank market power and firm investment. Finally, we also test the existence of cash flow sensitivity to the Lerner index and bank concentration measures as well.

The contribution of this paper is also fourfold: (i) bank market power exert negative influence in firm investment rate on the short run; (ii) the effects of bank market power is greater for the short run than for the long run, and the investment rate is recovered on the long run. The results are robust when we employ alternative investment variables as growth of assets or investment over assets, or even we substitute the Lerner index for measures of bank loan concentration; (iii) Granger causality test shows that bank market power causes firm investment, but not the opposite side, and finally, (iv) we also find the existence of cash flow sensitivity to investment considering bank market power environment, in particular, we find evidence for SME rather than the larger ones, which means that bank market becomes SME more conservatives in the short run but this effect could be relaxed

The remainder of the paper is structured as follows. Section 2 offers the background for theoretical and empirical literature on the different firm investment methodologies and bank market structure approaches. Section 3 presents the methodology. Section 4 presents the data, and database construction. Section 5 offers the main results. Finally, section 6 presents the main conclusions and policy implications.

2. Background literature on bank competition and firm financing and growth

Economic literature has recognize the importance of the availability of bank credit for SME (see Berger and Udell, 1998, 2002, 2006) or even in order to determinate the access to others financial resources as trade credit (see Fisman and Love, 2003;Fisman and Raturi, 2004; Petersen and Rajan, 1997). Those difficulties are reflected in access to external finance is mirrored in asymmetric information, and even

SME could find several financial constraints which difficult growing or shutting down (see Canales and Nanda, forthcoming).

A large strand of financial literature has also shown that bank organization is a relevant determinate for firm financial availability. We discuss several positions which advocates that an strong competitive position can be positive, or on the other hand negative, for firm financing (see Berger, 1995; Berger and Udell, 2002; Berger and Black, 2011; Boot and Thakor, 2000; Carbó *et al.*, 2009; Cetorelli and Gambera, 2001; Cetorelli, 2004; Elsas, 2005; Ogura, 2010, 2012; Sapienza, 2002; Scott and Dunkelberg, 2003, 2010; Zarutskie, 2006)[1]. In this vein, we find in economic literature several arguments which defends that bank concentration supposes an obstacle for firms in order to obtain external finance, especially in countries with poor institutional development or restrictions (see Beck *et al.*, 2004) and in particular for more vulnerable SME (see Craig and Hardee, 2007). Coccorese (2008) finds that banking consolidation, while in the long run might emerge an inverse relationship, and economic expansion tends to reduce the concentration in favour of competitors. Agostino and Trivieri (2008, 2010) shows, for Italian firms, negative effect of local bank market power on firms' access to bank finance. Scott and Dunkelberg (2010) find that increases in bank competition improve both bank and non-bank financing availability. Canales and Nanda (forthcoming) analyse the effects of bank deregulation and competition on the amount and price of loans offered to firms. They show that decentralized banks tend to give more lending to firms, particularly SME, increasing entrepreneurial activity, as well as attending to lending terms. Financial institutions give more attractive terms to firms in

---

[1] Berger *et al.* (2004) offer an extensive overview of the effects of bank concentration on firm financing, particularly for the case of SME financing, and future research agenda as well.

competitive environmental markets, but are in better position to select the healthiest firms and restrict credit in areas where they have market power.[2]

Investigators have expanded their research agenda to include the analysis of bank market structure, competition and concentration on bank-firm, in particular emphasis on relationship lending. In relation to our research, we find sound arguments demonstrating that bank market power might be perceived by financial institutions as a necessary tool to extract information of borrowers (see Ogura, 2010; Petersen and Rajan, 1994, 1995; Rajan, 1992). The seminal work presented by Petersen and Rajan (1995, 2002) concludes that better information accession is not necessarily conditioned to hard information about borrower creditworthiness since this fact allows banks to lend to more increasingly distance firms without compromising their ability to underwrite or monitoring those credits, whilst Petersen and Rajan (1994, 1995) provides theoretical framework showing that competition in credit markets is a key question to determine the value of lending relationship.[3] In this line, the authors establish that competition and long-term relationship are not necessarily compatible, and banks are less able to retain borrowers, and increased bank market power has a positive association with credit availability since lenders are able to capture a larger share of future loan interest surpluses from borrowers. On the other hand, recent financial literature recognizes that financial institutions not only employ statement information as transactional lending as a whole, but hard information technology could be also employed for smallest firms as fixed-asset lending, asset-based lending, credit scoring and the soft technology properly

---

[2] In a close paper, Erel (2011) show that after mergers, market overlap increases cost savings, and then lowers the spreads, but on the other hand, when the overlap is large enough, spreads increase as a consequence of bank market power effect.

[3] This branch of financial literature has motivated numerous studies on the importance of the impact of bank-borrower distance on credit availability, loan pricing and borrower-lender performance (see Agarwal and Hauswald, 2006, 2010; Berger and De Young, 2006; Brevoort and Hannan, 2006; De Young *et al.*, 2008, 2011; Degryse and Ongena, 2001, 2005; Uchida *et al.*, 2012).

of relationship lending (see Berger and Udell, 1998, 2002, 2006)[4]. Dell'Ariccia (2000) shows that the effect of banking competition on screening could result some ambiguous resulting in a prisoner's dilemma in which banks should decide between relationship and transactional lending. Boot and Thakor (2000) show that bank competition reduce the profitability of transactional lending in relation with relationship lending. Therefore, the authors find the existence of the benefit that each bank gains investing in knowledge is decreasing as the rent increases, so the rent per unit of relationship lending decreases. Degryse and Ongena (2001) find that profitability is higher if firm maintains only a single bank relationship, whilst firms replacing relationship with more banks are generally smaller and younger than firms not replacing relationships.[5] Carbó *et al.* (2012) find that firms with more intense relationships throughout its length and lower number of banks enjoy greater credit availability and are less likely to be credit constrained. In the same sense, Kano (2011) find that bank-borrower relationship depends on three factors identified by economic literature: verifiability of information, bank size and complexity, and bank competition. Based on Japanese database, the authors find evidence that longer relationship are benefit for borrowers and smaller banks in terms of reduced loan interest rates and credit availability, although they find that bank competition has little effect on the benefits derived from relationship lending.

Building of this analysis, we find other papers which document the existence of a U-shaped effect of market concentration and bank-firm relationship (see Degryse and Ongena, 2007; Ogura, 2010, 2012; Ongena *et al.*, 2012; Presbitero and Zazzaro, 2011). Elsas (2005) indicates, for firms which borrow from five major German banks, the

---

[4] Recent empirical papers have made important progress by confirming the possibility of banks using hard technology to expand SME or improve their information set to other minor customers. The comparative advantage of large banks in hard information technologies do not appear to be monotonically increasing in firm size (see Berger et al., 2005a,b; Berger and Black 2011; Frame *et al.*, 2001).
[5] See also Goddard and Wilson (2009); Goddard *et al.*, (2007, 2011) for a complete overview on New Industrial Organization approaches as profit hypotheses, as well as different methodological aspects.

presence of U-shaped relationship between bank concentration of a local credit market and the likelihood of a relational bank-firm tie. Those results demonstrate that the higher concentration of credit market, the less the probability of a bank to assume the role of *Hausbank* status, with a marginal increase in concentration. Degryse and Ongena (2007) confirm the U-shaped relationship between market concentration and the likelihood of bank branches engaging in providing bank credit. This result confirms the non-monotonic effect of market concentration is robust to controlling for the presence of local credit markets of bank with multiple contacts. Presbitero and Zazzaro (2011) extend their analysis suggesting that this non-monotonicity can be explained by looking at the organizational level of local credit markets. Moreover, the authors provide evidence that a marginal increase in bank competition is in detrimental to relationship lending in markets where *Hausbank* are dominants. Ongena *et al.* (2012) explores the determinants of creditors' concentration using an extensive bank-firm database for German firms. They show that bank borrowing is often concentrated in a *Hausbank* which pays an important role in determining creditor concentration. In this line, bank market power might play a role "on the intensive margin" (see Ongena, 2012: 845). Related to the former papers, Ogura (2012) predicts that bank marker power, measured as the price cost margin, improves the credit availability, in particular for younger firms, although in the second step of his analysis, the results reveal that the adjusted price cost margin is negatively correlated to the share of nationwide larger banks, as well as they provides evidence for the positive impact of the price cost margin, as measure of bank market power, on credit availability to new firms, as well as indirect evidence of higher bank market power is likely to be generated by relationship banking. In this way, Ogura (2012) also shows that the price cost margin is the inverse U-shaped, consistent with those presented by Dinc (2000) theoretical model.

As we have explained in this section, competition in banking markets might result as an influential factor over the relationships between banks and firms and therefore, lending availability and even the terms of such loans. In this paper the main research question is whether bank market power is also a determinant factor on firm investment rate in the short and long term. We find in financial literature several authors who demonstrate that bank market structure could be extended through firm creation and growth (see Black and Strahan, 2002; Cetorelli and Gambera, 2001; Cetorelli, 2004; Cetorelli and Strahan, 2006; Degryse *et al.*, 2011; Bonaccorsi di Patti and Dell'Ariccia, 2004; Bonaccorsi di Patti and Gobbi, 2007). Black and Strahan (2002) examine the effects of bank market concentration on new firms' incorporations. The authors find a strong negative relationship between bank market concentration and new business formation. Those results support the traditional view that banks with higher market power limits the supply of loans to potential entrepreneurs to start new entrepreneurs, therefore, bank market power could not be a help to new firms by raising the rewards to the formation of long term relationships between banks and firms. Bonaccorsi di Patti and Dell'Ariccia (2004) find the existence of bell-shaped relationship between bank market concentration and firm creation. Moreover, the authors also find evidence that bank competition might result less favourable to the birth of new firms in industrial sector were informational asymmetries are more important. This argument is consistent with previous theoretical models that explicitly consider asymmetric information between lenders and borrowers, and predict that bank competition might reduce the availability of credit to more informational opaque firms. In the same research line, Zarutskie (2006) examines the impact of bank competition on the bank credit and firm investment and she conclude that in bank competitive environments younger firms invert less, suggesting that competition increases firm financing constraints, diminishing

the effects in the long run, in line with Rice and Strahan (2010) who find that firms in a more competitive environment are more likely to borrow from bank at a lower cost. We also find other papers relating bank market concentration and firm size. Cetorelli (2004) find that changes on improving market competition leads to remove financial barriers to new firms, as well as could help to increase firm size in terms of added value or employment. Closely related with our work, Bonaccorsi di Patti and Gobbi (2007) find that firms borrowing from banks involved in process of M&A have a higher investment rate after the merger, whilst Degryse *et al.*, (2011) criticize that Bonaccorsi di Patti and Gobbi (2007) fail to find larger mergers effect for firms that are less bank dependent.

3. Methodology

This section presents the main theoretical and empirical approach used in this paper to show the existing relationship between bank market power and firm investment, as well as, in a second step, formulate our hypotheses.

3.1. Theoretical approach

In this section, we develop the theoretical foundations which will serve as basis to relate firm investment and bank market power. In our theoretical model, we consider a firm which produces a perishable product employing an initial amount of initial investment, fixed capital, variable capital considered as labour force. Second, we take into account to propose our model that firms differ in their managers' skills in order to search credit conditions, as well as firms also differ in information availability and credit risk. These features enable us to isolate the investment price since each firm pays a different price for its capital depending on bank interest rate, financial expenses and firm's risk premium. Third, risk premium to be paid by the firm is a factor which

depends fundamentally on bank's risk aversion, as well as credit availability and bank market structure. Then, we could consider risk aversion as bank specific and use it as nexus variable to link firm's characteristic and bank market structure, i.e. bank market power.

We base our theoretical framework on the Euler equation model à la Bond and Meghir (1994) in order to relate firm investment variable and firm investment cost. Therefore, we consider a firm whose net present value at the beginning of the period t, in absence of taxes, is given by the following Bellman's equation:

$$V_t(K_{t-1}) = \max_{L_t, K_t} \{ \Pi(K_t, L_t, I_t) + \beta'_{t+1} E[V_{t+1}(K_t)] \} \tag{1}$$

s.t. $K_t = (1-\delta)K_{t-1} + I_t$ \hfill (2)

where $\Pi(K_t, L_t, I_t)$ is the net revenue function in which L represents costless adjustable factors and I represents gross investment at the beginning of period and is immediately productive, but the firm faces strictly convex adjustment cost in changing its capital stock. The capital stock K evolves according to the equation of motion (2) where δ is the depreciation rate. The expectation operator $E[\cdot]$ is conditional on information available at the beginning of period t and the expectations are taken over future interest rates, input, and outputs prices, and technology. We assume symmetric information and the firm objective is to maximize the wealth of its shareholders. Defining r_t to be the firm's nominal required rate of return between periods t and $t+1$, and $\beta'_{t+1} = 1/(1 + r_t)$ is the firm discount factor. To obtain an empirical model of investment we represent the firm's revenue function given by

$$\Pi_t = p_t F(K_t, I_t) + p_t G(K_t, I_t) - wL_t - p^I I_t \tag{3}$$

In the previous expression, we introduce $G(I_t, K_t) = \frac{1}{2} bK_t \left(\left(\frac{I}{K} \right)_t - c \right)^2$ as a symmetric cost adjustment function which is linearly homogeneous in investment and

capital. The parameter c represents the bliss point, and $b > 0$ denotes the cost parameter that determines the function curvature, and represents the magnitude to investment cost. The term $\left(\frac{I}{K}\right)_t$ represents the investment rate variable and corresponds with our objective variable of this paper. The term $F(K_t, I_t)$ is a constant return to scale production function, p_t is the price of firm's output, w_t is the vector of prices for variable inputs L and P_t^I is price of investment goods. The price elasticity of demand is given by $(\alpha = 1 - (1/\varepsilon) > 0)$ with $\varepsilon > 1$.

We derive the firm's revenue function (3) with respect to investment (I) and capital (K) to obtain the first-order conditions

$$\left(\frac{\partial \Pi}{\partial I}\right)_t = -b\alpha p_t \left(\frac{I}{K}\right)_t + bc\alpha p_t - p_t^I \tag{4}$$

$$\left(\frac{\partial \Pi}{\partial K}\right)_t = \alpha p_t \left(\frac{Y}{K}\right)_t - \alpha p_t \left(\frac{\partial F}{\partial L}\frac{L}{K}\right)_t + b\alpha \left(\frac{I}{K}\right)_t^2 - bc\alpha p_t \left(\frac{I}{K}\right)_t \tag{5}$$

The Euler equation characterizing the optimal path of investment is given by

$$(1-\delta)\beta_{t+1}' E\left[\frac{\partial \Pi}{\partial I}\right]_{t+1} = -\left(\frac{\partial \Pi}{\partial I}\right)_t - \left(\frac{\partial \Pi}{\partial K}\right)_t - v_t \left(\frac{B}{K}\right)^2 \tag{6}$$

We isolate the price of investment goods (P_t^I) constitutes a variable hinge in our theoretical reasoning. To the best of our knowledge, this is the first paper that isolates the price of investment goods to study the factors that affects the firm financing investment. The debt term $(B/K)^2$ represents the loans borrowed by the firm (B) to the stock of capital (K) and controls for non separability between investment and borrowing decisions and is eliminated under Modigliani and Miller (1958) debt irrelevance ($v_t = 0$).

Solving the Bellman's equation, we obtain the following final expression:

$$\left(\frac{I}{K}\right)_{t+1} = c(1-\phi_{t+1}) - \frac{1}{(1-\delta)\beta_{t+1}'b\alpha p_{t+1}} P_{it}^I - \frac{1}{b\alpha p_{t+1}} P_{it-1}^I + (1+c)\phi_{t+1}\left(\frac{I}{K}\right)_t + \frac{\phi_{t+1}}{b\alpha}\left(\frac{CF}{K}\right)_t \phi_{t+1}\left(\frac{I}{K}\right)_t^2 - \frac{(1+r_t)v_t}{(1-\delta)b\alpha}\left(\frac{B}{K}\right)^2 \tag{7}$$

Where $\phi_{t+1} = \dfrac{(1 + r_{t+1})p_{t+1}}{(1-\delta)p_t} > 1$ represents the real discount factor and we assumed to be

constant through the time and across firms and treat it as a parameter. Similarly,

$\dfrac{CF}{K} = \dfrac{p_t Y_t - wL}{p_t K_t}$ is the ratio of real cash flow to the capital stock and we reflect the

proportion of internal funds that the firm employ to invest. Firm's investment depends

on the existent level of itself in the previous period, internal funds and the amount of

debt that the firm is capable to contract.

Since firm financing is associated with transaction costs incorporated in our

model by introducing the cost function associated with obtaining credit represented by

P_t^I. This function denotes, loan arrangement fees and commissions charges, and implicit

cost, such as cost of verification of financial status. Therefore, for simplicity of

expression, we can assume that all the explicit and implicit costs increase linearly with

the level of borrowing, i.e., $P_t^I(B_t) = \theta B_t$, $\theta > 0$. Since the firm employs to finance its

investment bank loans and internal funds, we suppose that $P_t^I(B_t)$ to be a linear function

in investment costs associated with the factors explained above.

$$P_t^I = \beta_0 + \beta_1 r_t^B + \beta_2 RP_t + \beta_3 FE_t \tag{8}$$

Where the intercept (β_o) is the amount of internal funds that the firm employ to invest

which is specified as independent because of we are concerned only in banking market

analysis. The term r_t^B represents the interest rate paid by the firm, risk premium (RP_t) is

the additional amount of paid by the firm for risk, and finally, Financial expenses (FE_t)

are the expenses associated to obtain bank credit. The whole coefficients are expected

positive.

The second step of our analysis consists to obtain the value of RP_t in order to link bank market power, and bank characteristics as well, to firm investment.[6] In this paper, the bank is viewed as a risk-averse dealer in the credit market acting as an intermediary between the demanders and supplier of funds.[7] The bank has three components in its portfolio. The first component is its initial wealth (W_0) which is invested in a diversified portfolio. The second component is a net credit inventory (I). It is assumed that deposits (D) and loans (L) has the same maturity period. The difference in market value of deposits and loans defines the bank's credit inventory (I = L − D). Finally, the third component is the bank's short-term net cash flow or money market position (M). The bank sets the loan rate and charges a premium to compensate credit risk. The bank's initial wealth is determined by the difference between the portfolio (I_0) and the money market position (M_0)

$$W_0 = L_0 - D_0 + M_0 = I_0 + M_0 \tag{9}$$

After considering the bank's level of wealth, we could formulate the bank's utility function using the Taylor's expansion rule as follows:

$$EU(W) = U(\overline{W}) + U'(\overline{W})E(W - \overline{W}) + \tfrac{1}{2}U''(\overline{W})E(W - \overline{W})^2 \tag{10}$$

Therefore, we could formulate the bank's maximization problem as:

$$\mathrm{Max}_{RP}EU(\Delta W) = (\alpha_L - \beta_L * RP)\Delta EU(W_L) \tag{11}$$

Finally, solving the expression (11) we obtain the variable RP:

$$RP = \frac{1}{2}\frac{\alpha_L}{\beta_L} + \frac{1}{2}\frac{C(L)}{L} - \frac{1}{4}\frac{U''(\overline{W})}{U'(\overline{W})}\left[(L + 2L_0)\sigma_L^2 + (L - 2M_0)\sigma_M^2 + 2(M_0 - L_0 - L)\sigma_{LM}\right] \tag{12}$$

The final expression (12) reflects the elasticity of the demand for loans (β_L), such as the less elastic the demand the bank will be able to apply greater the risk premium. Therefore, the ratio (α_L/β_L) represents the bank market power, being (α) the

---

[6] This step of our analysis is based on Ho and Saunders (1981) seminal work.
[7] The bank's utility function is a Von Newmann-Morgenstern utility function continuous and doubly differentiable $U' > 0$ and $U'' < 0$ and therefore the model ensures that the bank is risk-averse.

intercept. The risk-aversion $[-U''(\overline{W})/U'(\overline{W})]$ resulting the expression greater than zero, the greater is risk-aversion banks will charge higher risk premium to firms. The volatility of money market interest rates ($\sigma_M{}^2$) and the credit risk ($\sigma_L{}^2$) are increasing the risk premium, as well as, jointly with ($\sigma_{LM}{}^2$). The total volume of credit is given by (L + 2L$_0$). For a given value of money market interest rate or credit risk a large operation would mean a potential loss so the bank requires a greater risk premium.[8]

Once we have revised the economic literature on firm investment and bank market power, and based on the theoretical framework presented above, we could propose the following two testable hypotheses:

Hypothesis 1: *There is an inverse relationship between bank market power and the firm investment rate. As the bank market power increases, the firm investment rate declines.*

Hypothesis 2: *The impact of bank market power is greater on the short run than on the long run. Therefore, we can predict that the effects of bank market power will be gradually easing.*

3.2. Empirical specification and variables approximation

In this section, we introduce the main empirical equation to be estimated, as well as the empirical measures of the theoretical variables obtained in the previous section. Hence, based on equation (7) the empirical investment equation to be run is given as:

$$\left(\frac{I}{K}\right)_{i,t+1} = \varphi_0 + \varphi_1 P_{it}^I + \varphi_2 P_{it-1}^I + \varphi_3 \left(\frac{I}{K}\right)_{it} + \varphi_4 \left(\frac{CF}{K}\right)_{it} + \varphi_5 \left(\frac{I}{K}\right)_{it}^2 + \varphi_6 \left(\frac{Y}{K}\right)_{it} + \varphi_7 \left(\frac{B}{K}\right)_{it}^2 + \varphi_8 MA_{jt} +$$

$$\varphi_9 Crisis_t + \sum_{h=1}^{H} \varphi_h IND_h + \sum_{l=1}^{L} \varphi_l REG_l + \varepsilon_t$$

(13)

---

[8] See also Allen (1988), Angbanzo (1997), Carbó and Rodriguez (2007), Maudos and Fernández de Guevara (2004), McShane and Sharpe (1985); Saunders and Schumacher (2000) among others, for several extensions of the model.

The next step relates the investment specification presented above to the cost of firm investment (P_{it}^I) which includes, the bank market power measure ($LERNER_{it}$), and the cost of firm financing as well:

$$P_{it}^I = \gamma_0 + \gamma_1 \left(\frac{FE}{TA}\right)_{it} + \gamma_2 \left(\frac{r^B}{TA}\right)_{it} + \gamma_3 LERNER_{jt} + \gamma_4 \left(\frac{C(L)}{L}\right)_{jt} \tag{14}$$

Finally, introducing (14) into (13), we obtain the main empirical specification to test our hypotheses.

Let us present now the empirical measures presented in expressions (13) and (14). The main endogenous variable to measure firm investment is the ratio investment to firm's capital ratio ($I/K)_{it}$ represented in expressions (7) and (13). Firm investment (I_{it}) will be proxied as the fixed capital stock available by the firm i, corrected by capital depreciation (δ) considered as a constant equal to 0.1, computed according to the capital motion equation represented in the expression (2), whilst firm's capital (K_{it}) represents *the firm's fixed assets* in balance sheet. Alternatively, we include two alternative variables to measure firm investment and control for robustness in our results.[9] First, we include asset growth ($\Delta A_{it}/A_{it-1}$) measured as change in firm's total assets over lagged total assets. This variable predicts future abnormal returns. Second, we also include the ratio investment to total assets ($I/A)_{it}$.

The ratio cash flow over capital ($CF/K)_{it}$ controls for cash flow-investment sensitivity (see Bond and Soderbom, 2010; Kaplan and Zingales, 1997, 2000). Cash flow (CF_{it}) is measured as *profit before tax and extraordinary* plus *depreciation*. Firm's debt ($B/K)_{it}$ will be proxied as the SABI items *Non-current liabilities: long term debt* and *current liabilities: loans* over *firm's fixed assets*. The firm's financing investment could be carried out for increasing of internal funds though the life of firm.

---

[9] See Huang *et al.* (2011).

Thus, we could add to the model the output term to control for imperfect competition and is eliminated from the Euler equation under perfect competition, otherwise the coefficient on this term is positive. We measure the output $(Y/K)_{it}$ as sales generated by the firm over *firm's fixed assets*. Finally, the variable $Crisis_t$ is a temporal dummy to control for the effect of financial crisis which takes on the value one from 2007 to 2009, and zero otherwise.

The expression (14) reports the components of the cost of investment. However, the ratio $(FE/TA)_{it}$ is measured as the firm's financial expenses over firm's total assets; whilst the ratio $(r^B/TA)_{it}$ represents the firm's interest paid over total assets. The following three variables are related to the link between the firm and its correspondent bank. Hence, the variable $(C(L)/L)_{it}$ represents the bank cost for loans and is measured as the ratio bank's average operating cost over bank's total loans.

3.3. Measuring bank market power: Lerner index, HHI, C3, and C5

The market structure (α_L/β_L) shown in expression (12) is proxy by Lerner index ($LERNER_{jt}$) as our main indicator or market power. We employ the Lerner index based on the Monti-Klein imperfect competition model given by:

$$LERNER_{jt} = \frac{r_{jt} - r_t - C'_{jt}}{r_{jt}} = \frac{p_{jt} - C'_{jt}}{p_{jt}} \tag{15}$$

Where r_{jt} is the interest rate that the bank j charges to borrowers, and r_t is the interest rate of inter-bank market, as noted above, and C'_{jt} is the bank marginal cost. The margin $(r_{jt} - r_t - C'_{jt})$ determines the market power, and p_{jt} is the ratio *interest income* plus *other operating income* to *bank's total assets*. The computation of marginal cost (C'_{jt}) is based on the specification of the following translog cost function:

$$\ln C_{jt} = \alpha_0 + \ln TA_{jt} + \tfrac{1}{2}\alpha_k (\ln TA_{jt})^2 + \sum_{h=1}^{3} \beta_h \ln w_{hjt} + \tfrac{1}{2} \sum_{h=1}^{3} \sum_{k=1}^{3} \beta_{hk} \ln w_{hjt} \ln w_{kjt}$$

$$+ \tfrac{1}{2} \sum_{h=1}^{3} \gamma_h \ln TA_j \ln w_{hjt} + \mu_1 Trend + \mu_2 \tfrac{1}{2} Trend^2 + \mu_3 Trend \ln TA_j$$

$$+ \sum_{h=1}^{3} \lambda_h Trend \ln w_{hjt} + \ln u_j$$

(16)

Where C_{jt} is the bank's total cost (financial and operating costs), TA_{jt} is total assets, and w_{jt} the cost of inputs (labour, capital, and the cost of deposits). We include the variable *Trend* to control for technological changes over time. A system of factor demand (share) equations is derived according to Shephard's lemma as:

$$\frac{\partial \ln c_j}{\partial \ln w_{hj}} = m_{hjt} \equiv \beta_h + \sum_{j=1}^{3} \beta_k \ln w_{kjt} + \tfrac{1}{2}\gamma_h \ln TA_{jt} + \lambda_h Trend \qquad (17)$$

where m_{hjt} is the cost share of factor h for bank j in period t.

As a robustness check we substitute the $LERNER_{jt}$ for Hirschman-Herfindhal index (HHI_{jt}) and the concentration index $C3_{jt}$ and $C5_{jt}$ in the expression (14). Let us present a brief methodological discussion about the four indicators presented above. Carbó *et al.*, (2009), in a close empirical approach, find evidence that Lerner index and *HHI* produce opposite results when bank market power and credit availability are related. Particularly, the authors find that, on the one hand, Lerner index indicated that a higher bank market power is associated with higher financial constraints; on the other hand, the *HHI* indicated that bank market power is related with lower financial constraints. Other related papers relies more on the *HHI* as a measure of bank market power rather than the Lerner index, especially those related with the so called structure-conduct-performance hypothesis. Closely related with our paper, Black and Strahan, (2002) employ the HHI, whilst Beck *et al.* (2004, 2006a) uses asset concentration of the three largest banks, to find that bank market concentration constitute a financial obstacle

to firms. Bonaccorsi di Patti and Dell'Ariccia (2004) and Bonaccorsi di Patti and Gobbi (2007) also employ the *HHI* as measure of bank market power to relate bank market power and firm creation. In addition, Ongena et al. (2012: 837) explains that *HHI* could be overestimated for smaller firms, and then they offer a correction for total loans of the *HHI*.

On the other hand, Lerner index has been extensively used by the so-called New Empirical Industrial Organization approach in which techniques to estimate the parameters of a firm's behavioral equation is employed, and then measures of marginal cost are also obtained (see Richard Schmalensee, 1989). Aghion *et al.* (2005) shows that Lerner index is preferable to *HHI*, based on that the first test the gap between marginal cost and prices, i.e. the mark-up, which constitutes a measure firm by firm, and then it does not depend on regional distribution as the second one.[10] Based on this theoretical argument, we consider that the Lerner index could be the best measure of bank market power in our research; and then we consider that the *HHI*, and *C3* and *C5* might be the best robustness measure of bank market power.

3. 4. Testing Granger causality test

We use Granger causality test to study the direction of Lerner index and firm investment and among the financial measures. We employ four lags (*l*) of the variables in order to capture the long term effects of bank market power, and concentration, measures on the firm investment rate. Since our sample consist in a panel data, the empirical specification follows Holtz-Eaking *et al.* (1988) considering fixed effects (f_i), *N* firms ($i = 1,…, N$), and *T* periods ($t = 1,…, T$). Finally, the statistical significance for the Granger test is measured using an F-test. We expect two plausible results:

---

[10] In a related paper, Ogura (2012) uses the price-cost margin as measure of bank market power.

Case 1: We expect that bank market power is statistically significant and causes firm investment rate:

$$\left(\frac{I}{K}\right)_{it} = \beta_0 + \sum_{l=1}^{L} \beta_l \left(\frac{I}{K}\right)_{i,t-l} + \sum_{l=1}^{L} \gamma_l Lerner_{j,t-l} + \varphi_t f_i + u_{it} \qquad (18)$$

Case 2: We expect that firm investment rate should not be cause of influence on bank market structure:

$$Lerner_{jt} = \beta_0 + \sum_{l=1}^{L} \beta_l \left(\frac{I}{K}\right)_{i,t-l} + \sum_{l=1}^{L} \gamma_l Lerner_{j,t-l} + \varphi_t f_i + u_{it} \qquad (19)$$

4. Data and database construction

The main data source containing firm level data is the *Bureau van Dijk's* SABI (2010) database. The SABI database contains comprehensive information on balance sheet, financial statement and financial ratios around 1 million of Spanish and Portuguese firms for the period 1998 to 2009. Our sample consists in 61,174 firms, which suppose a panel data consisting in 578,188 firm-bank observations.

For each company SABI reports the main bank which firm operates with as variable. Therefore, this characteristic allows us to complement firm information with the parameters of its correspondent bank balance sheet and financial statement and for each period, i.e., we are able to link firm and bank information in only a unique database. Hence, the second set of variables consists on bank information. We construct the bank dataset from the financial statements provided by Spanish Banking Association (AEB), Spanish Savings Banks Association (CECA) for savings banks data, and National Union of Credit Cooperatives (UNACC) for credit cooperatives data.[11] After construct firm and bank panel data, we are able to merge both datasets. To our

---

[11] The acronyms correspond with the Spanish denominations: *Asociación Española de Banca* (AEB), *Confederación Española de Cajas de Ahorros* (CECA), and *Unión Nacional de Cooperativas de Crédito* (UNACC).

knowledge, merging firm and bank databases in a unique one is the best methodology to study how the phenomena derived from banking markets is transmitted to firms. Table 1 contains the definition and explanatory comments of the variables employed in this paper. To alleviate the effects of outliers, we winsorize all variables at 5% before include them in our results.

5. Results

This section present and discusses the main results obtained to test the hypotheses formulated in this paper.

5.1. Summary statistics and parametric and non-parametric tests

This section introduces a brief discussion of summary statistics and the parametric test for comparison of means and Kolmogorov-Smirnov test. Table 2 reports summary statistics of the variables employed in this research. Regarding to investment variables we show from Panel A that firm investment rate $(I/K)_t$ shows a mean of 0.28 ranging from -0.24 and 1.98, whilst asset growth $(\Delta A_{it}/A_{it-1})$ and investment to assets ratio show a mean value of 0.13 and 0.0001, respectively. Regarding to control variables, the ratio cash flow over capital $(CF/K)_{it}$ shows a mean of 0.89, whilst the ratio leverage over capital $(B/K)_{it}$ has a mean of 2.32. The Lerner index $(LERNER_t)$ is the variable of interest showing a mean value of 0.22 ranging from 0.001 and 0.68, whilst the mean value for the HHI is 1.29 per cent, and C3 and C5 0.48 and 0.34 per cent, respectively. Panel B reports the mean values of investment variables, cash flow and leverage divided by four quartiles of Lerner index. This first statistical test shows that $(I/K)_{it}$ ranges from 0.33 in the first quartile to 0.28 in the fourth quartile, whilst $(I/A)_{it}$ ranges from 0.00018 in the first quartile to 0.00016 in the fourth quartile. This result

reveals in a first step that investment variables are decreasing as bank market power environment is increasing.

To complement the above result we perform two-sample Kolmogorov-Smirnov test and test for comparison of means as it is shown in Table 3. In the first step, we create the dummy variable Lerner_D_{jt} which takes on the value one for values of LERNER$_{it}$ from third quartile in order to proxy for high bank market power environment. Kolmogorov-Smirnov test rejects the null hypothesis (H_0: F(z) - G(z) = 0) and confirms the existence of significant difference in distribution of all our investment variables at one percent (p = 0.000). Since Kolmogorov-Smirnov test only report for differences in distribution but not the sign adopted by variables, therefore, we should perform the parametric test for comparison of means in order to know where lays the sign of each variable. We show that parametric test reject the null hypothesis (H_0: mean(0) − mean(1) = 0) for all our investment variables and shows that the alternative hypothesis is confirmed for $(I/K)_{it}$ and $(I/A)_{it}$ for environment with lower level of bank market power at one percent (H1: mean(0) − mean (1) > 0). Contrary to our expectations, the asset growth ($\Delta A_{it}/A_{it-1}$) variable show higher values in environment of high bank market power. Regarding to $(CF/K)_{it}$, we show that firms tend to maintain higher liquidity levels in higher bank market power environment which reveals conservatives attitude of firms to invest. The other interest variable is leverage $(B/K)_{it}$ which reveals that is easier to firm to obtain bank financing in a more competitive banking market, as well as $(r^B/TA)_{it}$ which reveals that in a more competitive banking market is cheaper to obtain bank financing. Considering the obtained results as a whole, we could conclude that in presence of bank market power firms are less able to obtain bank financing since credit availability is also restricted. Additionally, we also find that the cost of bank financing is also higher in environments of higher bank market power. This result is

consistent with previous papers which show that an increase in bank market concentration leads to a lessening on loans availability and, a subsequent increase on the interest rates that banks charge to firms (see Canales and Nanda, forthcoming; Erel, 2011; Kano *et al.*, 2011; Rice and Strahan, 2010 Panetta *et al.*, 2009). Therefore, with those results in hand, we are able to show that firm investment is also negatively affected by bank market power (see Zarutskie, 2006). Firms need to finance their capital investment using bank financing, and then the presence of bank market power might drive to banks to reduce relationship lending (see Presbitero and Zazzaro, 2011), and financial resources could be reduced in form of financial constraints (see Beck *et al.*, 2004, 2006b; Carbó *et al.*, 2009); as result, firms have less financial choices to carry out the necessary investment in fixed assets.

5.2. *The baseline model*

The estimation of the expressions (13) and (14) are shown in table 4 by using the Arellano and Bond's (1991) GMM estimator in order to test our hypotheses. The results suggest that an increase in bank market power, measured as LERNER_{jt} has a twofold effect on firm investment. According with our hypotheses we find that an increase of bank market power induces to a reduction of firm investment rate $(I/K)_{it}$ in the short term (-0.0585) whist, on the other hand, we find that the firm investment rate is recovery in the long run (0.0702) considering the whole sample. Those results are robust whether we substitute $(I/K)_{it}$ for asset growth $(\Delta A_{it}/A_{it-1})$ and investment over assets ratio $(I/A)_{it}$ as dependent variable. In this way, we find very close results if we consider $(\Delta A_{it}/A_{it-1})$ as dependent variable compared to the case of $(I/K)_{it}$, showing a coefficient of -0.0475 for LERNER_{jt-1} and 0.0586 for LERNER_{jt-2}. On the other hand, the

results for $(I/A)_{it}$ are qualitatively similar in sign and significance but showing lower values reaching -0.000080 and 0.0000590, for LERNER$_{jt-1}$ and LERNER$_{jt-2}$, respectively.

Moreover, we are also concerned to study whether the effect of bank market power has similar effect on large and small and medium firms. We obtain the expected signs for both type of firms but we also find that the effect of bank market power is higher and significant at 1 per cent for SME (-0.0587) than the largest ones (-0.0326). Moreover, we find that the correction for firm investment is also higher for the SME (0.0745) than the largest ones (0.0320). Those results are found to be consistent when we introduce the variable MA$_{jt}$ because of we obtain positive and significant coefficient for the whole sample (0.004), being only significant for the SME (0.005) suggesting that bank merger processes has a higher influence on smaller firms rather than largest ones. The above results are robust with the asset growth and investment over assets specifications.

The discussion of the results presented above proceeds as follows. The estimations show a twofold behaviour of the bank market power on firm investment. In a first period, they are not being able to have the demanded bank financing to carry out the necessary investments. This means that in the short term bank market power can restrict firm investment in fixed capital. Then, in a second period, firms are capable to adapt themselves to the new situation of higher bank market power environment, thus they can restore the levels of investment. Our result should be interpreted by the supply side of banking market since we are considering as determinant a strictly exogenous factor as bank market power, which is an independent factor firms as will be demonstrated in the next subsection. However, those results presented in this section represents a second step to connect our theory with those studies that support that the higher bank market power, the less bank financing. Let us remark that the major strand

of the most recent financial literature analysing shows the effects of bank market power over firms based on static analysis (see Beck *et al.*, 2004, 2006b; Bonaccorsi di Patti and Dell'Ariccia, 2004; Carbó *et al.*, 2009, 2012, among others), our paper goes one step forward, and extends financial literature through the effects of bank market power on the long term. Although, those papers agree in that bank market power leads to a subsequent financial constraints effect, to the best of our knowledge, we found no papers extending their analysis to firm investment rate. Nevertheless, those papers are in line with our first result which shows that bank market power reduces firm investment. Moreover, our results show that firm investment rate is recovered in the long term. This results represents that, in the long term, the bank-firm relationships is also improve during subsequent periods, and bank financing is also recuperated in the long term (see Ogura, 2012). Furthermore, the closest methodology could to be found in Bonaccorsi Di Patti and Gobbi (2007: 691) which also relates firm's credit issued by banks involved in M&A over firm investment rate. In line with our finding, they also show an increase in firm investment rate in the long term for firms borrowing from banks involved in M&A processes.

We also find that this effect is more exacerbated for SME which are more restricted due to problems derived from information asymmetry. Financial literature has demonstrated that less competitive environment might dampen relationship lending for SME, and even, diminish credit availability, in favour of transactional lending for more transparent and largest firms. Therefore, in the light of our results is logical to conclude that the impact of bank market power on firm investment might be higher for SME than for the largest firms.

The rest of control variables show the expected signs. We find that crisis dummy present negative and significant sign (-0.0151) indicating that during the recent crisis

period firms decrease significantly the investment process, and then reflects the loss of economic growth. Regarding the debt variable $(B/K)^2_{it-1}$, the sign is negative and significant which seems to be the correct one as implied by the tax bankruptcy cost specification. Moreover, we have shown the expected sign for cash flow predicted by the theoretical model, hence, the negative sign predicted by the Bond and Meghir (1994) theoretical model has been made under the assumption of the firm can rise the finance at a given price. If this assumption is incorrect then the cash flow may reflect an excess of sensitivity of investment to cash flow, a fact consistent with the economic literature.

5. 3. Granger causality test

We are also concerned to study the causality between firm investment and bank market power. We employ the Granger causality test with four lags for bank market power and concentration variables, and firm investment rate. The results shown in table 5 suggest that bank market power ($LERNER_{jt}$) predicts firm investment, but firm investment does not predict bank marker power. To check the robustness of this result, we incorporate in our Granger test alternative measures of bank concentration such as the indexes HHI and C5. The results are qualitatively similar to those obtained above in signs and significance, so we can conclude, employing several measures, which banking structure is a strong conditioning for firm investment, but we do not find empirical evidence that the relationship could be the inverse situation considering bank market power neither even bank concentration measures. Moreover, firm control variables maintained for the whole regressions conserve the expected signs and significance for all the specifications.

The results reinforce those presented in the GMM estimation presented in the previous section. Hence, in this way, this finding imply that bank market structure affects credit conditions such as credit availability or interest rates, but not the reverse happens and firms could not conditions bank market structures depending on the level of firm investment. Therefore, our results show bank market power is a strictly exogenous factor to firm financing behaviour.

5. 4. Cash flow-investment sensitivity

In this section we examine whether firm's internal funds availability exert some kind on influence on the firm investment depending on bank market power. Table 6 presents the cash flow-investment sensitivity analysis by using 2SLS Baltagi's instrumental variables estimator. We also divide the sample in large and SME firms in order to consider the differences in cash flow sensitivity depending on firm size. We find that firms classified as SME exhibit a larger sensibility to cash flow (0.0471) than the larger ones (0.0342). The results remain similar even we exclude firm control variables of specification. Nevertheless, the main interest is to check the sensitivity of internal funds on bank market power and firm investment. Therefore, we interact $(CF/K)_{it}$ and LERNER_{jt} in order to check the joint effect of internal funds and bank market power on firm investment (see Bonaccorsi Di Patti and Gobbi, 2007). We obtain negative and statistically negative sign for the lagged variable for Lerner index $(\text{LERNER}_{jt-1}*(CF/K)_{it})$ whilst, on the other hand, the sign turn to become positive in the current period $(\text{LERNER}_{jt}*(CF/K)_{it})$. Therefore, we conclude that bank market power is cash flow sensitive, and the effect become negative in the long term. We also find differences depending on the firm size. The effect is statistically significant for SME but we do not find the same for the largest ones.

The results are inverted whether we interact the sensitivity of investment to cash flow and the former one. We find that the sign of for the lagged value of bank market power and cash flow ($\text{LERNER}_{jt-1}*(CF/K)_{it}$) becomes negative and significant, whilst the sign for the current period is positive and significant. Moreover, investment interaction remain positive and statistically significant for the lagged period for investment ($(I/K)_{it}*(CF/K)_{it}$) and even considering the investment squared ($(I/K)^2_{it}*(CF/K)_{it}$).

5. 5. *Robustness check: the effects of bank concentration*

The specification of the baseline model presented in table 4 suggests that bank market power exerts a negative effect on firm interment rate on the short term, but on the other hand, this relationship is corrected in the long term becoming increasing.

To check the robustness of our previous results, we estimate in table 7 three alternative specifications replacing LERNER_{jt} by measures of bank market concentration such as HHI_{jt}, $C3_{jt}$, and $C5_{jt}$ and dividing the sample in large firms and SME. The correspondence of HHI and Lerner index, and the relationship with firm investment, depends on the evolution of market contestability and bank information production (see Carbó *et al.*, 2009; Ongena *et al.*, 2012; Panetta et al., 2009; Presbitero and Zazzaro, 2011). We obtain results similar to those obtained using the Lerner index which demonstrates the robustness of our results. The alternative measures support the existence of declining of firm investment rate in the short term, whist the relations turn to be positive in the long term.

6. Conclusions

Motivated by recent theoretical and empirical works, in this paper we have tested the implications of bank market power on firm investment from a dynamic perspective. Of the two findings that we consider as the most important in this paper, one suggests that the effects of bank market power exerts a negative effect on firm investment in the short term, consistent with other researchers who have employed static models and US data. The second result, and maybe the most important contribution in this paper, is that in the long term firms are able to be adapted to the new situation, and the bank financing could be recovered, and as a consequence, firm investment would be also increased. To the best of our knowledge, this is the first papers that analyses the repercussions of bank market power, in particular using the Lerner index, on firm financing and growth considering the long term.

Additionally, we also perform the Granger causality test in order to determinate the causality between bank market power and firm investment rate. Our results confirm that bank market power is a determinant of firm investment, but we do not find causality in the opposite direction. The results are robust whether we include measures of bank concentration such as HHI and C5 index. In a second step, we are also concerned to study the cash flow-investment sensitivity and the effects of bank market power on internal funds. Hence, we find that bank market power is cash flow sensitive to investment diminishing the impact on cash flow in the long term.

In the light of our findings, the main policy implications that can be derived are those related with the formation of a sound banking system derived from M&A or financial integration. Many governments are reluctant to permit mergers or new entrants (policy-induced barriers) for fear that the resulting market power make to decrease the economic growth. We find evidence of this financial integration can derive in a stable firm investment rate, and consequently permits the economic growth in the long term.

Table 1:
Definition of variables

Variable	Definition
Firm variables	
Firm investment $(I/K)_{it}$	This ratio is the endogenous variable and represents the rate of investment. This ratio is defined as the difference among the tangible fixed assets at end year minus the depreciation (assumed 10%) of the tangible fixed assets at the beginning of the year over the amount of tangible fixed assets.
Asset growth (ΔA_{it})	This ratio constitutes an alternative proxy for the investment growth in terms of total assets. This ratio is defined as the growth rate of firm's total assets.
Investment over assets $(I/A)_{it}$	This ratio is defined as the difference between firm's investment as we have defined above (I), and firm's total assets (A). This ratio also proxy for firm's investment level.
Cash-flow over capital $(CF/K)_{it}$	This ratio is defined as cash flow in relative terms to the proportion of capital. Cash flow is defined as net income plus depreciation plus changes in deferred taxes (Kaplan and Zingales, 1997, 2000; Fazzari *et al.*, 2000).
Firm leverage $(B/K)_{it}$	This ratio measures firm leverage over the proportion of capital. This variable represents the level of risk which the firm is able to support..
Financial expenses $(FE/TA)_{it}$	This ratio is proxied as the amount of financial expenses incurred by the firm's total assets. Financial expenses are the expenses associated to obtain bank credit
Bank interest rate for I $(r^B/TA)_{it}$	This ratio measures the financial cost over firm's total assets. The term r^B represents the interest rate paid by the firm to obtain bank financing.
Firm output $(Y/K)_{it}$	This variable represents the firm output. This ratio is proxied as total sales plus the variation in stocks during the year over the amount of tangible fixed assets.
Bank Variables	
Bank cost for loans $(C(L)/L)_{jt}$	This ratio represents the bank's average operating costs for loans. This ratio is measured as operating cost over total loans.
$LERNER_{jt}$	Lerner index measures the degree of competition in banking markets. This index is defined as the difference among the price and the bank marginal cost, divided by the price, and measures the capacity of the bank to set price above the marginal cost, being an inverse function of the elasticity of the demand and the number of banks.
$LERNER\_D_{ji}$	Dummy variable which takes on the value one if Lerner is above the median, and zero otherwise.
HHI_{jt}	Herfindhal-Hirschman concentration index measures the degree of market concentration. This index is defined as the squared market shares of each one of the banks operating in the Spanish market.
$C3_{jt}$	The concentration index C3 measures the degree of market concentration for the three largest banks operating in the Spanish market.
$C5_{jt}$	The concentration index C5 measures the degree of market concentration for the five largest banks operating in the Spanish market.
Price of labour $(w_1)_{jt}$	This ratio is defined as personnel cost over total assets. The variable is measured in natural logarithm.
Price of capital $(w_2)_{jt}$	This ratio is defined as operating cost (except personnel cost) over fixed assets. The variable is measured in natural logarithm.
Price of deposits $(w_3)_{jt}$	This ratio is defined as financial cost over deposits. The variable is measured in natural logarithm.
$Crisis_t$	This dummy controls for crisis period and takes on the value one from 2007 to 2009, and zero otherwise.
Mergers and Acquisitions (MA_{jt})	This dummy controls for mergers and acquisitions processes, and takes on the value one whether the financial institution has been enveloped in a process of M&A.

Table 2:
Summary statistics

Panel A: Summary statistics					
Variable	Observations	Mean	SD	Min.	Max.
Firm variables					
$(I/K)_{it}$	427,912	0.2813127	0.5277204	-0.2362832	1.975
$(I/K)^2_{it}$	427,912	0.1700819	0.3001115	0.0007277	0.9410364
$(\Delta A_{it}/A_{it-1})$	435,816	0.1308849	0.2563873	-0.2169172	0.8244228
$(\Delta A_{it}/A_{it-1})^2$	435,816	0.0873366	0.1712306	0.0001016	0.6856772
$(I/A)_{it}$	427,901	0.000158	0.0003569	-0.000157	0.0013715
$(I/A)^2_{it}$	427,901	1.79e-07	5.07e-07	1.82e-12	2.13e-06
$(CF/K)_{it}$	483,066	0.8940378	1.328627	-0.0971272	5.282685
$(B/K)_{it}$	413,996	2.324521	7.290771	0.00	58.33333
$(B/K)^2_{it}$	413,996	58.55861	377.7071	0.00	3,402.778
$(FE/TA)_{it}$	484,447	0.0182237	0.0179719	0.00	0.0958084
$(r^B/TA)_{it}$	481,804	0.0170357	0.0164634	0.00	0.0842517
$(Y/K)_{it}$	391,289	18.15885	21.02752	1.578984	67.19231
Bank variables					
$(C(L)/L)_{jt}$	571,738	0.0021198	0.0041773	4.48e-07	0.0363564
$LERNER_{jt}$	286,305	0.2193837	0.1493782	0.0006745	0.6832959
HHI_{jt}	578,154	0.0129423	0.019828	0.00	0.0785534
$C3_{jt}$	400,338	0.0047919	0.0049498	0.00	0.0189458
$C5_{jt}$	292,183	0.0033579	0.0033127	0.00	0.0132126
Price of labour $(\ln(w_{1jt}))$	575,320	-4.569463	0.3244934	-6.791513	-1.361451
Price of capital $(\ln(w_{2jt}))$	568,459	-2.470802	1.571512	-10.4102	5.806305
Price of deposits$(\ln(w_{3jt}))$	577,021	-3.719975	0.4122791	-8.699653	-0.8853336
Dummies					
$Crisis_t$	578,188	0.2547545	0.4357235	0.00	1.00
MA_{jt}	578,188	0.3407819	0.4739726	0.00	1.00

Panel B: Means of investment variables, cash flow and leverage depending on the quartiles of $LERNER_{jt}$. Standard Errors in parenthesis.

	Observations	1st Quartile	2nd Quartile	3rd Quartile	4th Quartile
$(I/K)_{it}$	427,912	0.3312377	0.2669492	0.2627551	0.2879356
		(0.5732014)	(0.5112919)	(0.5037093)	(0.5151222)
ΔA_{it}	435,816	0.1172832	0.113532	0.1356893	0.1576307
		(0.2561884)	(0.2486805)	(0.2535963)	(0.2572901)
$(I/A)_{it}$	427,901	0.0001884	0.0001427	0.0001399	0.0001688
		(0.0003872)	(0.0003399)	(0.0003356)	(0.0003605)
$(CF/K)_{it}$	483,066	0.8596219	0.7795086	0.8739317	0.8113462
		(1.302885)	(1.209579)	(1.288377)	(1.204683)
$(B/K)_{it}$	413,996	1.699321	1.962852	1.859209	1.609669
		(4.538185)	(5.030817)	(4.879051)	(4.512294)

Table 3:
Parametric test for comparison of means and two-sample Kolmogorov-Smirnov test for equality of distribution functions by LERNER_D$_{jt}$.

	Parametric test for comparison of means		Kolmogorov-Smirnov
	Mean differences are reported. Diff = mean (0) − mean (1) under H$_0$: Diff = 0 t-statistics in parenthesis. Standard errors are reported.		Diff: F(z) − G(z) under H$_0$: Diff = 0
Variable	**Coefficient (t-statistics)**	**Standard errors**	**Coefficient [p-value]**
Firm variables			
$(I/K)_{it}$	0.0230266††† (14.1573)	0.0016265	0.0176 [0.000]
$(\Delta A_{it}/A_{it-1})$	-0.0306263*** (-39.1897)	0.0007815	0.0650 [0.000]
$(I/A)_{it}$	0.0000101††† (9.1882)	1.10e-06	0.0123 [0.000]
$(CF/K)_{it}$	-0.031193*** (-8.0834)	0.0038589	0.0303 [0.000]
$(B/K)_{it}$	47.09448††† (2.6472)	17.7906	0.0261 [0.000]
$(FE/TA)_{it}$	0.0019166††† (36.8350)	0.000052	0.0511 [0.000]
$(r^B/TA)_{it}$	0.0014501††† (30.3264)	0.0000478	0.0444 [0.000]
$(Y/K)_{it}$	-0.6092249*** (-8.9855)	0.067801	0.0153 [0.000]
Bank variables			
$(C(L)/L)_{jt}$	0.0024433††† (229.2520)	0.0000107	0.4664 [0.000]
HHI$_{jt}$	0.0206666††† (456.0154)	0.0000453	0.6454 [0.000]
C3$_{jt}$	0.0034498††† (216.1979)	0.000016	0.4487 [0.000]
C5$_{jt}$	0.0019238††† (126.2729)	0.0000152	0.2352 [0.000]
Price of labour (ln(w$_{1jt}$))	0.0266096††† (30.8878)	0.0008615	0.2035 [0.000]
Price of capital (ln(w$_{2jt}$))	0.0212458††† (5.0867)	0.0041768	0.0851 [0.000]
Price of deposits(ln(w$_{3jt}$))	0.4741475††† (542.3220)	0.0008743	0.5581 [0.000]
Dummy variables			
Crisis$_t$	0.2032619††† (179.8123)	0.0011304	0.2033 [0.000]
MA$_{jt}$	0.3248717††† (273.1635)	0.0011893	0.3249 [0.000]

Notes: *, **, *** statistically significant at the 10, 5 and 1% level, respectively under Ho: Diff. < 0
†, ††, ††† statistically significant at the 10, 5 and 1% level, respectively under Ho: Diff. > 0

Table 4: The impact of bank marker power on firm investment, 1998-2009

Arellano and Bond (1991) dynamic panel data regression.
t-statistics in parenthesis (White (1980) heterokedastic-robust standard errors).

	$(I/K)_{it}$			$(\Delta A_{it}/A_{it-1})$			$(I/A)_{it}$		
	The whole sample	Large firms	SME	The whole sample	Large firms	SME	The whole sample	Large firms	SME
Intercept	0.277***	0.277***	0.278***	0.0781***	0.0738***	0.0787***	0.000163***	0.000137***	0.000167***
	(71.13)	(15.97)	(66.80)	(37.19)	(12.35)	(34.90)	(63.75)	(18.06)	(60.96)
$(I/K)_{it-1}$	0.0144***	0.0143***	0.0140***						
	(10.50)	(3.40)	(9.55)						
$(\Delta A_{it}/A_{it-1})_{it-1}$				-0.00217	0.00376	-0.00329			
				(-1.08)	(0.61)	(-1.52)			
$(I/A)_{it-1}$							0.0243***	0.0246***	0.0238***
							(13.44)	(3.96)	(12.52)
$(FE/TA)_{it-1}$	-0.657***	-0.834***	-0.631***	-1.067***	-1.082***	-1.055***	-0.0000747	-0.000237*	-0.0000528
	(-5.59)	(-3.32)	(-4.83)	(-13.18)	(-5.14)	(-11.97)	(-1.37)	(-2.14)	(-0.85)
$(FE/TA)_{it-2}$	0.0923	-0.173	0.131	0.0534	-0.0232	0.0816	0.0000889	0.00000251	0.0000878
	(0.84)	(-0.70)	(1.07)	(0.69)	(-0.11)	(0.99)	(1.39)	(0.02)	(1.23)
$(r^B/TA)_{it-1}$	-0.643***	-0.0259	-0.728***	-3.317***	-2.616***	-3.418***	-0.000929***	-0.000291	-0.00102***
	(-4.43)	(-0.07)	(-4.58)	(-30.90)	(-8.61)	(-29.80)	(-11.49)	(-1.43)	(-11.45)
$(r^B/TA)_{it-2}$	-0.310*	0.401	-0.407**	1.229***	1.190***	1.211***	-0.000316***	0.0000819	-0.000355***
	(-2.32)	(1.17)	(-2.78)	(12.82)	(4.16)	(11.91)	(-3.75)	(0.38)	(-3.85)
$LERNER_{jt-1}$	-0.0585***	-0.0326*	-0.0587***	-0.0475***	-0.0374***	-0.0464***	-0.000080***	-0.0000267***	-0.0000838***
	(-13.00)	(-2.45)	(-12.25)	(-15.95)	(-4.03)	(-14.73)	(-28.91)	(-3.45)	(-28.48)
$LERNER_{jt-2}$	0.0702***	0.0320*	0.0745***	0.0586***	0.0684***	0.0589***	0.0000590***	0.0000192*	0.0000623***
	(16.16)	(2.35)	(16.18)	(20.99)	(7.31)	(19.91)	(21.08)	(2.35)	(20.95)
$(C(L)/L)_{jt-1}$	-3.779***	-2.200**	-3.902***	-2.947***	-2.312***	-2.983***	-0.00120***	-0.000647***	-0.00126***
	(-16.32)	(-3.23)	(-15.87)	(-20.85)	(-5.69)	(-19.82)	(-12.27)	(-3.38)	(-11.88)
$(C(L)/L)_{jt-2}$	-2.857***	-2.931***	-2.827***	-1.461***	-3.074***	-1.418***	-0.00233***	-0.000350	-0.00237***
	(-15.41)	(-4.40)	(-14.68)	(-12.01)	(-6.14)	(-11.26)	(-22.93)	(-1.39)	(-22.42)
$(CF/K)_{it-1}$	-0.0447***	-0.0439***	-0.0449***	0.0102***	0.0127***	0.00987***	-0.000019***	-0.0000195***	-0.0000190***
	(-26.26)	(-10.04)	(-24.71)	(12.35)	(5.24)	(11.42)	(-19.72)	(-6.94)	(-18.73)
$(I/K)^2_{it-1}$	1.523***	1.518***	1.523***						
	(476.63)	(153.20)	(452.49)						
$(\Delta A_{it}/A_{it-1})^2_{it}$				1.275***	1.269***	1.276***			
				(467.76)	(160.31)	(438.93)			
$(I/A)^2_{it}$							650.9***	635.5***	652.0***
							(426.58)	(117.24)	(410.17)
$(Y/K)_{it-1}$	-0.0105***	-0.0105***	-0.0105***	0.000267***	0.0000128	0.000291***	-0.000005***	-0.00000464***	-0.00000458***
	(-63.84)	(-22.76)	(-60.38)	(3.68)	(0.05)	(3.85)	(-45.72)	(-13.23)	(-44.00)

$(B/K)^2_{it-1}$	-1.63e-12	-1.53e-08***	-1.63e-12	4.27e-14	-8.47e-11	4.86e-14	-1.40e-16	1.74e-12***	-1.39e-16
	(-1.34)	(-18.39)	(-1.34)	(0.13)	(-0.39)	(0.15)	(-1.06)	(9.54)	(-1.06)
$Crisis_t$	-0.0151***	-0.00545	-0.0149***	-0.0222***	-0.0120**	-0.0223***	-0.000009***	-0.00000177	-0.00000898***
	(-6.72)	(-0.90)	(-6.17)	(-14.69)	(-2.82)	(-13.72)	(-8.75)	(-0.84)	(-8.14)
MA_{jt}	0.00474*	0.00232	0.00509*	0.00519**	0.00410	0.00539**	0.00000284	-0.00000210	0.00000327
	(2.02)	(0.32)	(2.07)	(3.07)	(0.85)	(3.01)	(1.80)	(-0.48)	(1.96)
Obs	204,303	22,397	181,906	206,637	22,708	183,929	204,303	22,397	181,906
Wald test (p-value)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Sargan test (p-value)	0.0000	0.0188	0.0000	0.0000	0.0000	0.0000	0.0000	0.0060	0.0000
m1 (p-value)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
m2 (p-value)	0.0872	0.1603	0.1643	0.0000	0.4224	0.0043	0.7361	0.9356	0.6797

Notes: *, **, *** statistically significant at the 10, 5 and 1% level, respectively.

Table 5: Granger Causality Test

Instrumental variable regression with fixed effects
The whole variables are expressed in first differences.
t-statistics in parenthesis

	$(I/K)_{it}$	$LERNER_{jt}$	$(I/K)_{it}$	HHI_{jt}	$(I/K)_{it}$	$C5_{jt}$
Intercept	-0.141***	0.0230***	-0.0688**	0.000381***	-0.0500	0.00189***
	(-7.14)	(16.03)	(-2.80)	(24.14)	(-0.67)	(84.04)
$(I/K)_{it-1}$	-0.322***	0.00578	-0.304***	-0.000170	-0.315***	0.00000281
	(-15.88)	(0.78)	(-14.37)	(-1.82)	(-11.90)	(0.22)
$(I/K)_{it-2}$	-0.185***	0.00193	-0.163***	-0.000166*	-0.156***	0.00000137
	(-9.33)	(0.40)	(-7.87)	(-2.22)	(-5.89)	(0.11)
$(I/K)_{it-3}$	-0.083***	-0.000203	-0.0692***	-0.000140*	-0.0685**	-0.000000559
	(-5.17)	(-0.06)	(-4.13)	(-2.55)	(-3.19)	(-0.05)
$(I/K)_{it-4}$	-0.0147	-0.000846	-0.0123	-0.0000775*	-0.000441	-0.000000851
	(-1.54)	(-0.43)	(-1.24)	(-2.48)	(-0.03)	(-0.14)
$LERNER_{jt-1}$	0.108*	-0.0690***				
	(2.14)	(-3.99)				
$LERNER_{jt-2}$	0.612***	-0.0744***				
	(19.10)	(-6.11)				
$LERNER_{jt-3}$	0.700***	-1.014***				
	(16.37)	(-96.50)				
$LERNER_{jt-4}$	0.355***	-0.346***				
	(8.80)	(-37.69)				
HHI_{jt-1}			15.17***	-0.0212***		
			(5.99)	(-8.11)		
HHI_{jt-2}			9.764***	-0.204***		
			(5.31)	(-94.98)		
HHI_{jt-3}			8.715***	0.127***		
			(4.40)	(52.32)		
HHI_{jt-4}			0.350	0.199***		
			(0.27)	(97.96)		
$C5_{jt-1}$					84.19***	-0.163***
					(4.16)	(-12.70)
$C5_{jt-2}$					0.889	-0.191***
					(0.10)	(-42.63)
$C5_{jt-3}$					-81.96***	-0.723***
					(-8.38)	(-147.23)
$C5_{jt-4}$					-96.44***	-0.650***
					(-6.41)	(-76.42)
$(CF/K)_{it}$	-0.194***	0.0150***	-0.222***	-0.0000385	-0.216***	-0.00000664
	(-18.27)	(4.22)	(-20.12)	(-0.82)	(-14.93)	(-0.94)
$(Y/K)_{it}$	-0.084***	0.00480	-0.0884***	0.0000248	-0.079***	-0.000000975
	(-38.44)	(1.89)	(-38.30)	(1.28)	(-30.07)	(-0.73)
$(B/K)^2_{it}$	7.77e-10	5.74e-11	-5.21e-12**	-4.34e-16	-5.90e-12***	-1.74e-16
	(0.48)	(0.45)	(-3.16)	(-0.06)	(-3.95)	(-0.24)
$(r^B/TA)_{it-1}$	1.986	4.736***	5.463***	0.000828	1.828	0.00170*
	(1.75)	(12.02)	(4.68)	(0.16)	(1.15)	(2.19)
$(FE/TA)_{it-1}$	-0.562	-1.669***	1.140	-0.00211	0.253	0.00116**
	(-0.90)	(-8.23)	(1.76)	(-0.79)	(0.30)	(2.82)
Obs	51,418	51,366	57,089	57,089	27,403	27,403
F-test (p-value)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Notes: *, **, *** statistically significant at the 10, 5 and 1% level, respectively.

Table 6: Cash flow-investment sensitivity depending on firm size

Dependent variable: rate of investment $(I/K)_{it}$
t-statistics in parenthesis.
2SLS Baltagi instrumental variables estimator

	The whole sample			Large firms			Small and medium firms		
Intercept	0.0458***	0.0566***	0.0458***	0.0470***	0.0841***	0.0465***	0.0436***	0.0536***	0.0436***
	(46.77)	(65.28)	(46.82)	(16.85)	(8.89)	(16.46)	(41.22)	(52.62)	(41.26)
$LERNER_{jt}$	-0.0514***	-0.0278***	-0.0519***	-0.0488*	-0.00230	-0.0497*	-0.0478***	-0.0191***	-0.0479***
	(-6.36)	(-5.92)	(-6.43)	(-2.27)	(-0.11)	(-2.33)	(-5.41)	(-3.80)	(-5.42)
$LERNER_{jt-1}$	0.0458***	0.0381***	0.0461***	0.0486**	0.00775	0.0482**	0.0435***	0.0359***	0.0435***
	(6.85)	(10.45)	(6.90)	(2.66)	(0.58)	(2.65)	(6.00)	(9.47)	(6.00)
$(I/K)^2_{it}$	1.640***	1.500***	1.640***	1.680***	1.571***	1.679***	1.644***	1.513***	1.644***
	(407.38)	(382.13)	(407.35)	(137.50)	(61.57)	(137.19)	(373.09)	(333.58)	(372.97)
$(CF/K)_{it}$	-0.0663***	-0.104***	-0.0665***	-0.0484***	-0.115***	-0.0487***	-0.0662***	-0.103***	-0.0665***
	(-53.32)	(-113.95)	(-53.47)	(-12.46)	(-13.91)	(-12.42)	(-49.27)	(-101.56)	(-49.44)
$(CF/K)_{it-1}$	0.0474***	0.0765***	0.0473***	0.0342***	0.0592***	0.0348***	0.0471***	0.0752***	0.0471***
	(50.19)	(98.89)	(50.16)	(11.80)	(18.96)	(12.09)	(46.25)	(89.79)	(46.27)
$LERNER_{jt}*(CF/K)_{it}$	-0.000104***	0.000271***	0.000169**	-0.00431	0.000921	0.00201	-0.000101***	0.000281***	0.000145**
	(-7.34)	(4.07)	(3.07)	(-1.35)	(0.71)	(1.18)	(-6.81)	(4.17)	(2.70)
$LERNER_{jt-1}*(CF/K)_{it}$	0.0000941***	-0.000211***	-0.000148**	0.00407	-0.000229	-0.00209	0.0000910***	-0.000224***	-0.000125**
	(8.70)	(-3.75)	(-2.99)	(1.29)	(-0.17)	(-1.26)	(8.24)	(-3.98)	(-2.58)
$(I/K)_{it-1}*(CF/K)_{it}$		0.000118***	0.000104***		0.00120***	0.000467		0.000103***	0.0000846***
		(6.32)	(4.28)		(3.41)	(0.37)		(5.43)	(3.61)
$(I/K)^2_{it}*(CF/K)_{it}$		0.0000877***	0.0000710***		0.00121***	-0.00129		0.0000857***	0.0000617***
		(6.38)	(4.88)		(4.99)	(-1.62)		(6.09)	(4.38)
$(C(L)/L)_{jt}$	-2.194***	-3.504***	-2.187***	0.481	-5.576***	0.591	-2.223***	-3.671***	-2.222***
	(-14.09)	(-28.85)	(-14.04)	(0.81)	(-7.31)	(1.00)	(-13.61)	(-28.04)	(-13.60)
$(Y/K)_{it}$	-0.000651***		-0.000647***	-0.00088***		-0.000877***	-0.000636***		-0.000631***
	(-19.04)		(-18.90)	(-8.76)		(-8.71)	(-17.31)		(-17.18)
$(FE/TA)_{it}$	0.454***		0.458***	0.397		0.400	0.343*		0.352*
	(3.60)		(3.63)	(1.35)		(1.36)	(2.40)		(2.46)
$(B/K)^2_{it}$	1.62e-13*		-2.18e-13	-1.39e-08		-0.00000011*	1.59e-13		-1.24e-13
	(1.97)		(-1.47)	(-1.30)		(-2.56)	(1.92)		(-0.85)
$(r^B/TA)_{it}$	-0.790***		-0.793***	-0.741*		-0.721*	-0.668***		-0.677***
	(-5.97)		(-6.00)	(-2.34)		(-2.29)	(-4.48)		(-4.54)
Obs	232,926	348,315	232,926	27,381	36,003	27,381	205,545	312,312	205,545
F-test (p-value)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Notes: *, **, *** statistically significant at the 10, 5 and 1% level, respectively.

Table 7: Robustness check. Measures with concentration index: HHI, C3, and C5.

Dependent variable: rate of investment $(I/K)_{it}$
t-statistics in parenthesis (White (1980) heterokedastic-robust standard errors).
Arellano and Bond (1991) dynamic panel data regression.

	The whole sample			Large firms			Small and medium firms		
Intercept	-0.602***	-0.590***	-0.584***	-0.561***	-0.576***	-0.551***	-0.600***	-0.591***	-0.587***
	(-62.58)	(-40.37)	(-47.32)	(-18.31)	(-13.39)	(-15.31)	(-58.71)	(-37.88)	(-44.37)
$(I/K)_{it-1}$	1.621***	1.631***	1.619***	1.725***	1.786***	1.724***	1.602***	1.608***	1.601***
	(96.61)	(69.42)	(83.12)	(28.58)	(20.19)	(24.34)	(91.11)	(65.93)	(78.52)
$(FE/TA)_{it-1}$	1.115***	1.400**	0.891*	0.875	-0.0357	-0.297	1.164***	1.626**	1.084**
	(3.61)	(3.01)	(2.36)	(1.11)	(-0.03)	(-0.31)	(3.45)	(3.17)	(2.61)
$(FE/TA)_{it-2}$	-0.568	-0.701	-0.631	-1.198	-0.754	-1.634	-0.448	-0.671	-0.476
	(-1.85)	(-1.46)	(-1.63)	(-1.64)	(-0.60)	(-1.56)	(-1.33)	(-1.30)	(-1.14)
$(r^B/TA)_{it-1}$	0.462	0.161	0.500	0.567	0.154	0.939	0.322	0.0382	0.332
	(1.23)	(0.29)	(1.09)	(0.55)	(0.10)	(0.77)	(0.79)	(0.06)	(0.67)
$(r^B/TA)_{it-2}$	1.051**	1.171*	1.107*	0.850	1.728	1.946	1.001*	1.065	0.951
	(2.88)	(2.08)	(2.43)	(0.87)	(1.13)	(1.51)	(2.54)	(1.77)	(1.95)
HHI_{jt-1}	0.468			0.509			0.421		
	(1.95)			(0.74)			(1.66)		
HHI_{jt-2}	-0.367			-0.652			-0.393		
	(-1.73)			(-1.08)			(-1.74)		
$C5_{jt-1}$		-10.39**			-15.40			-9.271*	
		(-2.60)			(-1.22)			(-2.22)	
$C5_{jt-2}$		12.46*			21.06			12.06*	
		(2.53)			(1.39)			(2.33)	
$C3_{jt-1}$			-11.74**			-8.217			-11.11**
			(-3.09)			(-0.76)			(-2.76)
$C3_{jt-2}$			10.28*			6.154			10.22*
			(2.37)			(0.52)			(2.21)
$(C(L)/L)_{jt-1}$	-1.697**	-2.296**	-2.381**	-3.146	-3.874	-2.838	-1.641*	-2.300**	-2.417**
	(-2.63)	(-2.71)	(-2.90)	(-1.76)	(-1.50)	(-1.16)	(-2.38)	(-2.58)	(-2.78)
$(C(L)/L)_{jt-2}$	0.406	-6.279	-4.890	-7.601	-15.65	-15.48	0.0395	-5.313	-3.977
	(0.12)	(-1.63)	(-1.30)	(-0.78)	(-1.40)	(-1.43)	(0.01)	(-1.30)	(-1.00)
$(CF/K)_{it-1}$	0.154***	0.155***	0.156***	0.134***	0.132***	0.139***	0.156***	0.158***	0.158***
	(34.73)	(23.48)	(28.99)	(10.48)	(6.82)	(9.10)	(33.40)	(22.67)	(27.77)
$(I/K)^2_{it-1}$	-2.887***	-2.892***	-2.884***	-3.065***	-3.119***	-3.067***	-2.859***	-2.860***	-2.856***
	(-101.53)	(-72.32)	(-86.83)	(-30.23)	(-20.92)	(-25.62)	(-96.21)	(-69.05)	(-82.35)
$(Y/K)_{it-1}$	0.0405***	0.0408***	0.0404***	0.0416***	0.0427***	0.0414***	0.0403***	0.0405***	0.0402***
	(107.55)	(76.04)	(90.29)	(34.62)	(24.87)	(30.74)	(101.45)	(71.71)	(84.84)

$(B/K)^2_{it-1}$	1.90e-12	8.71e-12***	8.79e-12***	3.17e-11***	3.16e-12**	2.59e-12*	1.83e-12	8.67e-12***	8.75e-12***
	(0.76)	(4.85)	(4.97)	(10.04)	(2.85)	(2.46)	(0.74)	(4.84)	(4.98)
$Crisis_t$	-0.0234***	-0.0160*	-0.0112*	-0.0286*	-0.0572*	-0.0289	-0.0213***	-0.0147*	-0.0110
	(-6.28)	(-2.39)	(-2.08)	(-2.22)	(-2.45)	(-1.54)	(-5.45)	(-2.10)	(-1.96)
MA_{jt}	-0.00434	-0.0160	-0.0156	0.000251	-0.000336	0.00874	-0.00492	-0.0175	-0.0175*
	(-0.71)	(-1.86)	(-1.85)	(0.01)	(-0.01)	(0.30)	(-0.77)	(-1.95)	(-1.99)
Obs	218,607	107,289	151,542	24,859	11,214	16,491	193,748	96,075	135,051
Wald test (p-value)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Sargan test (p-value)	0.0000	0.0000	0.0000	0.0000	0.0006	0.0000	0.0000	0.0000	0.0000
m1 (p-value)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
m2 (p-value)	0.1988	0.9721	0.1638	0.1910	0.4726	0.5111	0.2343	0.9138	0.2054

Notes: *, **, *** statistically significant at the 10, 5 and 1% level, respectively.

References
(Essay I: Bank market power and short term and long term in firm investment)

Agarwal, Sumit and Robert Hauswald. 2010. Distance and Private Information in Lending. Review of Financial Studies 23, 2757-2788.

Agarwal, Sumit and Robert Hauswald. 2006. Distance and Information Asymmetries in Lending Decisions. Mimeo. Accesed on June 7, 2012. Available at: http://www.eu-financial-system.org/fileadmin/content/Dokumente_Events/seventh_conference/Hauswald.pdf

Aghion, Philippe; Nick Bloom; Richard Blundell; Rachel Griffith and Peter Howitt. 2005. Competition and Innovation: An Inverted-U Relationship. The Quarterly Journal of Economics 120, pp. 701-728.

Agostino, Mariarosaria and Francesco Trivieri. 2010. Is Banking Competition Beneficial to SME? an Empirical Study Based on Italian Data. Small Business Economics 35, 335-355.

Agostino, Mariarosaria and Francesco Trivieri. 2008. Banking Competition and SMEs Bank Financing. Evidence from Italian Provinces. Journal of Industrial Competition and Trade 8, 33-53.

Allen, Linda. 1988. The Determinants of Bank Interest Margins: A Note. Journal of Financial and Quantitative Analysis 23, 231-235.

Angbanzo, Lazarus. 1997. Commercial Bank Net Interest Margins, Default Risk, Interest Rate Risk and Bank Off Balance Sheet Activities. Journal of Banking and Finance 21, 55-87.

Arellano, Manuel and Stephen Bond. 1991. Some Tests of Specification for Panel Data: Monte Carlo Evidence and an Application to Employment Equations. Review of Economic Studies 58, 277-297.

Beck, Thorsten; Asli Demirgüç-Kunt and Vojislav Maksimovic. 2004. Bank Competition and Access to Finance: International Evidence. Journal of Money, Credit and Banking. 36, 627-648.

Beck, Thorsten; Asli Demirgüç-Kunt and Ross Levine. 2006a. Bank Concentration, Competition and Crises: First Results. Journal of Banking and Finance. 30, 1581-1603.

Beck, Thorsten; Asli Demirgüç-Kunt; Luc Laeven and Vojislav Maksimovic. 2006b. The Determinants of Financing Obstacles. Journal of International Money and Finance. 25, 932-952.

Berger, Allen N. 1995. The Profit-Structure Relationship in Banking. Test for Market-Power and Efficient Structure Hypotheses. Journal of Money, Credit, and Banking 27, 404-431.

Berger, Allen N. and Lamont K. Black. 2011. Bank Size, Lending Technologies, and Small Business Finance. Journal of Banking and Finance 35, 724-735.

Berger, Allen N. and Robert De Young. 2006. Technological Progress and the Geographic Expansion of Commercial Banks. Journal of Money, Credit and Banking 38, 1483-1513.

Berger, Allen N. and Gregory F. Udell. 2006. A More Complete Conceptual Framework for SME Finance. Journal of Banking and Finance. 30, 2945-2966.

Berger, Allen N. and Gregory F. Udell. 2002. Small Business Credit Availability and Relationship Lending: The Importance of Bank Organisatinal Structure. Economic Journal 112, 32-53.

Berger, Allen N. and Gregory F. Udell. 1998. The Economics of Small Business Finance: The Role of Private Equity and Debt Markets in the Financial Growth Cycle. Journal of Banking and Finance 22, 613-673.

Berger, Allen N.; W. S. Frame and N. H. Miller. 2005a. Credit Scoring and the Availability, Price, and Risk of Small Business Credit. Journal of Money, Credit and Banking 37, 191-222.

Berger, Allen N.; M. A. Espinosa; W. S. Frame and N. H. Miller. 2005b. Debt Maturity, Risk, and Assymetric Information. Journal of Finance 60, 2895-2923.

Berger, Allen N.; Asli Demirgüç-Kunt; Ross Levine and Joseph G. Haubrich. 2004. Bank Concentration and Competition: An Evolution in the Making. Journal of Money, Credit and Banking. 36, 433-451.

Black, Sandra E. and Philip E. Strahan. 2002. Entrepeneurship and Black Credit Availability. Journal of Finance 57, 2807-2833.

Bonaccorsi di Patti, Emilia and Giovanni Dell'Ariccia. 2004. Bank Competition and Firm Creation. Journal of Money, Credit and Banking 36, 225-251.

Bonaccorsi di Patti, Emilia and Giorgio Gobbi. 2007. Winners Or Losers? The Effects of Banking Consolidation on Corporate Borrowers. The Journal of Finance 62, 669-695.

Bond, Stephen R. and Mans Soderbom. 2010. Conditional Investment-Cash Flow Sensitivities and Financing Constraints. Working Paper in Economics No. 448. University of Gothenburg.

Bond, Stephen and Costas Meghir. 1994. Dynamic Investment Models and the Firm's Financial Policy. Review of Economic Studies 61, 197-222.

Boot, Arnoud W. A. and Anjan V. Thakor. 2000. Can Relationship Banking Survive Competition? Journal of Finance 55, 679-713.

Brevoort, Kenneth P. and Timothy H. Hannan. 2006. Commercial Lending and Distance: Evidence from Community Reinvestment Act Data. Journal of Money, Credit, and Banking 38, 1991-2012.

Canales, Rodrigo and Ramana Nanda. forthcoming. A Darker Side to Decentralized Banks: Market Power and Credit Rationing in SME Lending. Journal of Financial Economics.

Carbó, Santiago and Francisco Rodriguez. 2007. The Determinants of Bank Margins in European Countries. Journal of Banking and Finance. 31, 2043-2063.

Carbó, Santiago; Hans Degryse and Francisco Rodriguez. 2012. Lending Relationships and Credit Rationing: The Impact of Securitization. Mimeo.

Carbó, Santiago; Francisco Rodriguez and Gregory F. Udell. 2009. Bank Market Power and SME Financing Constraints. Review of Finance 13, 309-340.

Cetorelli, Nicola. 2004. Real Effects of Bank Competition. Journal of Money, Credit and Banking 36, 543-558.

Cetorelli, Nicola and Philip E. Strahan. 2006. Finance as a Barrier to Entry: Bank Competition and Industry Structure in Local U.S. Markets. Journal of Finance. 61, 437-461.

Cetorelli, Nicola and Michele Gambera. 2001. Banking Market Structure, Financial Dependence and Growth: International Evidence from Industry Data. Journal of Finance 56, 617-648.

Coccorese, Paolo. 2008. An Investigation on the Causal Relationship between Banking Concentration and Economic Growth. International Review of Financial Analysis 17, 557-570.

Craig, Steven G. and Pauline Hardee. 2007. The Impact of Bank Consolidation on Small Business Credit Availability. Journal of Banking and Finance. 31, 1237-1263.

De Young, Robert; Dennis Glennon and Peter Nigro. 2008. Borrower-Lender Distance, Credit Scoring, and Loan Performance: Evidence from International-Opaque Small Business Borrowers. Journal of Financial Intermediation. 17, 113-143.

De Young, Robert; W. S. Frame; Dennis Glennon and Peter Nigro. 2011. The Information Revolution and Small Business Lending: The Missing Evidence. Journal of Financial Services Research 1-2, 19-33.

Degryse, Hans and Steven Ongena. 2007. The Impact of Competition on Bank Orientation. Journal of Financial Intermediation 16, 399-424.

Degryse, Hans and Steven Ongena. 2005. Distance, Lending Relationships, and Competition. Journal of Finance 60, 231-266.

Degryse, Hans and Steven Ongena. 2001. Bank Relationships and Firm Profitability. Financial Management 30, 9-34.

Degryse, Hans and Patrick Van Cayseele. 2000. Relationship Lending within a Bank-Based System: Evidence from European Small Business Data. Journal of Financial Intermediation 9, 90-109.

Degryse, Hans; Nancy Masschelein and Janet Mitchell. 2011. Staying, Dropping, Or Switching: The Impacts of Bank Mergers on Small Firms. Review of Financial Studies 24, 1102-1140.

Dell'Ariccia, G. 2000. Learning by Lending, Competition and Screening Incentives in the Banking Industry. Center for Financial Institutions Working Paper 00-10.

Dinc, IS. 2000. Bank Reputation, Bank Commitment, and the Effects of Competition in Credit Markets. Review of Financial Studies 13, 781-812.

Elsas, Ralf. 2005. Empirical Determinants of Relationship Lending. Journal of Financial Intermediation 14, 32-57.

Erel, Isil. 2011. The Effect of Bank Mergers on Loan Prices: Evidence from the United States. Review of Financial Studies 24, 1068-1101.

Farinha, L. A. and J. A. C. Santos. 2002. Switching from Single to Multiple Bank Lending Relationships: Determinants and Implications. Journal of Financial Intermediation 11, 124-151.

Fisman, Raimond and Inessa Love. 2003. Trade Credit, Financial Intermediary Development, and Industry Growth. Journal of Finance. 58, 353-374.

Fisman, Raymond and Mayank Raturi. 2004. Does Competition Encourage Credit Provision? Evidence from African Trade Credit Relationships. Review of Economics and Statistics 86, 345-352.

Frame, W. S.; A. Srinivasan and L. Woosley. 2001. The Effect of Credit Scoring on Small Business Lending. Journal of Money, Credit and Banking 33, 813-825.

Goddard, John and John O. S. Wilson. 2009. Competition in Banking: A Disequilibrium Approach. Journal of Banking & Finance 33, 2282-2292.

Goddard, John; Hong Liu; Philip Molyneux and John O. S. Wilson. 2011. The Persistence of Bank Profit. Journal of Banking & Finance 35, 2881-2890.

Goddard, John; Philip Molyneux; John O. S. Wilson and Manouche Tavakoli. 2007. European Banking: An Overview. Journal of Banking and Finance. 31, 1911-1935.

Ho, Thomas S. Y. and Anthony Saunders. 1981. The Determinants of Bank Interest Margins: Theory and Empirical Evidence. Journal of Financial and Quantitative Analysis 16, 581-600.

Holtz-Eaking, D.; W. Newey and H. Rosen. 1988. Estimating Vectors Autoregressions with Panel Data. Econometrica 56, 1371-1395.

Huang, Hui; Shi Xiaojun and Shunming Zhang. 2011. Counter-Cyclical Substitution between Trade Credit and Bank Credit. Journal of Banking and Finance Forthcoming, .

Kano, Masaji; Hirofumi Uchida; Gregory F. Udell and Wako Watanabe. 2011. Information Verifiability, Bank Organization, Bank Competition and Bank-Borrower Relationships. Journal of Banking and Finance 35, 935-954.

Kaplan, Steven N. and Luigi Zingales. 2000. Investment-Cash Flow Sensitivities are Not Valid Measures of Financing Constraints. Quarterly Journal of Economics 115, 707-712.

Kaplan, Steven N. and Luigi Zingales. 1997. Do Investment-Cash Flow Sensivities Provide Useful Measures of Financing Constraint? The Quarterly Journal of Economics. 112, 169-215.

Maudos, Joaquín and Juan Fernández de Guevara. 2004. Factors Explaining the Interest Margins in the Banking Sectors of the European Union. Journal of Banking and Finance. 28, 2259-2281.

McShane, R. W. and I. G. Sharpe. 1985. A Time series/cross Section Analysis of the Determinants of Australian Trading Bank loan/deposit Interest Margins: 1962-1981. Journal of Banking and Finance 9, 115-136.

Modigliani, Franco and Merton H. Miller. 1958. The Cost of Capital, Corporation Finance and the Theory of Investment. American Economic Review 48, 261-297.

Ogura, Yoshiaki. 2012. Lending Competition and Credit Availability for New Firms: Empirical Study with the Price Cost Margin in Regional Loan Markets. Journal of Banking & Finance 36, 1822-1838.

Ogura, Yoshiaki. 2010. Interbank Competition and Information Production: Evidence from the Interest Rate Difference. Journal of Financial Intermediation 19, 279-304.

Ongena, Steven; Günseli Tümer-Alkan and Natalja v. Westernhagen. 2012. Creditor Concentration: An Empirical Investigation. European Economic Review 56, 830-847.

Panetta, Fabio; Fabiano Schivardi and Matthew Shum. 2009. Do Mergers Improve Information? Evidence from the Loan Market. Journal of Money, Credit and Banking 41, 673-709.

Petersen, Mitchell A. and Raghuram G. Rajan. 2002. Does Distance Still Matters? the Information Revolution in Small Business Lending. Journal of Finance 57, 2533-2570.

Petersen, Mitchell A. and Raghuram G. Rajan. 1997. Trade Credit: Theories and Evidence. Review of Financial Economics. 10, 226-253.

Petersen, Mitchell A. and Raghuram G. Rajan. 1995. The Effect of Credit Market Competition on Lending Relationships. Quarterly Journal of Economics. 110, 407-443.

Petersen, Mitchell A. and Raghuram G. Rajan. 1994. The Benefits of Lending Relationships: Evidence from Small Business Data. Journal of Finance. 49, 3-37.

Presbitero, Andrea F. and Alberto Zazzaro. 2011. Competition and Relationship Lending: Friends Or Foes? Journal of Financial Intermediation 20, 387-413.

Rajan, Raghuram G. 1992. Insiders and Outsiders: The Choice between Informed and Arm's-Length Debt. The Journal of Finance 47, pp. 1367-1400.

Rice, Tara and Phillip E. Strahan. 2010. Does Credit Competition Affect Small-Firm Finance? Journal of Finance 65, 861-889.

Sapienza, Paola. 2002. The Effects of Banking Mergers on Loan Contracts. Journal of Finance 57, 329-367.

Saunders, Anthony and Liliana Schumacher. 2000. The Determinants of Bank Interest Margins: An International Study. Journal of International Money and Finance 19, 813-832.

Schmalensee, Richard, 1989. Chapter 16 Inter-Industry Studies of Structure and Performance. Volume 2, 951-1009.

Scott, Jonathan A. and William C. Dunkelberg. 2010. Competition for Small Firms Banking Business: Bank Actions Versus Market Structure. Journal of Banking and Finance 34, 2788-2800.

Scott, Jonathan A. and William C. Dunkelberg. 2003. Bank Mergers and Small Firm Financing. Journal of Money, Credit and Banking 35, 999-1017.

Uchida, Hirofumi; Gregory F. Udell and Nobuyoshi Yamori. 2012. Loan Officers and Relationship Lending to SMEs. Journal of Financial Intermediation 21, 97-122.

Zarutskie, Rebecca. 2006. Evidence on the Effects on Bank Competititon on Firms Borrowing and Investment. Journal of Financial Economics 81, 503-537.

Essay II:
Firm exports, liquidity management, and financial constraints

Firm exports, liquidity management, and financial constraints

This paper investigates the relationship between firm financial constraints, working capital finance and export activities. Our results suggest that financial constraints constitute an obstacle for firms to become in exporters, and even could reduce the percentage of foreign sales. We also find that an increase in cash conversion cycle, as well as net trade cycle, raises the probability of being an exporter, as well as the volume of foreign sales. Moreover, we find that an increase in collection and inventory period increases firm export activity, whilst by contrast, an increase in credit period reduces it (95 words).

1. Introduction and motivation

The current financial crisis has supposed a collapse in international trade between August 2008 and April 2009. The experienced drop in international trade was almost 30 percent following the Word Bank data, with roughly equally decline for advanced and emerging economies. Nevertheless, international trade has continued the recovery trend until the first quarter of 2012. Recently, a few papers have tested the coincidence between the great trade collapse and the global financial crisis and they show that the cut of bank credit is closely related with the downturn in international trade (see Ahn *et al.*, 2011; Alessandria *et al.*, 2010, 2011; Bems *et al.*, 2011; Bricongne *et al.*, 2012; Chor and Manova, 2012; Levchenko *et al.*, 2011; Kalina Manova, 2010; Manova *et al.*, 2011, among others). In this line, considering the consumer side, the global economy have also experimented a severe slowdown in demand which have clearly affected to international trade (see Manova, 2010).

The effects of distortions caused by translate of financial crisis into the real sector; have supposed disruptions on firm chain production, inventories adjustments and even new condition in trade finance among firms. The most recent literature on exports and trade finance has also focused their attention on the role of inventories as sales regulator in foreign markets (see Alessandria *et al.*, 2010, 2011). Moreover, financial literature has pointed out that firms which are able to increase working capital as well as alleviate firm financial constraints (see Ding *et al.*, forthcoming), whilst Wu *et al.* (forthcoming) show an asymmetric effect of the trade payables and receivables on cash holdings. The authors find that a more highly developed financial system helps firms to better use of trade credit as short term form of financing. Additionally, Claessens *et al.*, (forthcoming) find that financial crisis had a higher effect on firms with greater

sensitivity to business cycle and trade developments, in particular in countries more opened to trade.

The goal of this paper is twofold. Motivated by the existing literature, we are concerned to study the relationship between the lack of credit availability on the firm export condition, as well as the percentage of sales volume that firm designates to foreign customers. In the same way, we also seek to determine whether the firm's corporate liquidity management, measured as the length of time that firm manages its working capital represented by two index: the cash conversion cycle (CCC hereafter) and the net trade cycle (NTC hereafter) is an influent factor on firm exports.[1] We find that that credit constraints constitutes and obstacle to firm both in the side of export condition, i.e. on the probability of being an export firm, as well as on the volume of sales designated to exports. We obtained those results employing a twofold criterion of financial constraints. On the one hand, we construct a dummy variable constructed from the questionnaire responses which represents if the firm is financially constrained or not. We check the robustness of our result estimating a disequilibrium model, and moreover, we find that there exists strong the explaining power comparing for both methodologies. There has been robust empirical evidence that financial constraints (see Bellone *et al.*, 2010; Bricongne *et al.*, 2012; Campa and Shaver, 2002); Chor and Manova, 2012; Manova, 2010; Manova *et al.*, 2011). Whilst all prior studies focus on indirect measures of financial constraints (see Bellone *et al.*, 2010; Bricongne *et al.*, 2012; Greenaway *et al.*, 2007; Muûls, 2008), we conduct the results obtained to financial constraints employing survey data and considering direct measures of financial constraints. This allows us to consider only the cases of truly financially constrained

---

[1] The importance of liquidity management was pioneered by Smith (1980) who signaled the significance of the trade-offs between the dual aims of working capital management, and therefore, liquidity and profitability. In other words, decisions that tend to maximize profitability tend not to maximize the chances of adequate liquidity. Conversely, focusing almost entirely on liquidity would tend to reduce the potential firm's profitability (see Shin and L. Soenen, 1998).

firms, controlling more precisely for firms self-included as financially constrained, or even possible false negatives obtained from firms with lower dividends, lower level of liquidity, or small size that should not necessarily be included in this category.

Regarding to liquidity management, our results also suggest that liquidity management constitutes a determinant factor for firms in order to decide exporting. We do find that the larger the CCC, the higher the probability of being an exporter firm, and furthermore the amount of production sold in foreign markets is also increasing. Moreover, we are concerned to study deeply the causes of the direction of CCC, hence we emphasize the different components of the indicators and we conclude that collection period and inventory period influence positively on exports, whilst credit period shows the opposite effect.

The remainder of the paper proceeds as follows. Section 2 offers the background of theoretical and empirical literature on financial constraints, liquidity management and exports. Section 3 presents the theoretical model and defines our empirical approach as well as the database. Section 4 presents a discussion of our findings in light of the implications of the empirical model. Finally, Section 5 offers the main conclusions and the policy implications obtained from our research.

2. Background literature

Economic literature has extensively shown the importance of firm financial constraints, as well as liquidity constraints, on the volume of exports for firms. The most recent financial literature are focused on the drop of the volume of good traded in the export markets due to the recent banking crisis (see Amiti and Weinstein, 2011; Bricongne *et al.*, 2012; Chor and Manova, 2012; Iacovone and Zavacka, 2009; Park *et al.*, 2010, among others). The impact of banking crisis on exports constitutes a

particular question for researchers and hence, economic literature has identified at least two reasons why exporters differ from other firms at the impact of production growth. First, selling in international markets could be considered as a sign of efficiency and competitiveness by domestic investors, therefore, in a context of financial markets imperfections, exporting could be interpreted as a signal of firm creditworthiness to external export (see Bernard and Jensen, 1995, 1999, 2004; Iacovone and Zavacka, 2009). This argument is reinforced by Campa and Shaver (2002) who show that investment is less sensitive to cash flow for the group of exporters compared to the group of non-exporters, which means that exporting could help firm to reduce financial constraints. Greenaway and Richard Kneller (2004, 2007) and Greenaway *et al.* (2005, 2007) find no evidence in favour the hypothesis of less constrained firms self-select into export activities. Following this argument, we could formulate the question about the existence of relationship between bank credit constraints and firm export activities. In this vein, financial constraints gain a particular relevance since it may impinge for exporters more than on domestic firms, and then the effect of banking crises on exports could potentially be more adverse for exporter than domestic firms (see Amiti and Weinstein, 2011; Bellone *et al.*, 2010; Bricongne *et al.*, 2012; Chor and Manova, 2012; Greenaway and Kneller, 2007; Greenaway *et al*., 2007; Manova, 2010; Manova *et al.*, 2011). As noted by Bellone *et al.* (2010) financial health constitutes an important question in order to start exporting activities because of less-credit constrained firms self-select into export markets but they find no evidence of direct relationship between financial constraints and the amount of production sold in foreign markets. However, Bellone *et al.* (2010) employ as financial constraint measure a score index based on indirect measures related to some firm characteristics as well as liquidity ratio. In the same line, Bricongne *et al.* (2012) identify financially constrained firms if those have

experienced a default on credits in the previous year. Payment incident can be regarded as a generator of credit constraints since it could have a negative and significant impact on the amount of a new loan. The authors show that the impact of payment incidents during the crisis exerts a negative influence on the volume of firms' exports, compared to the exporting by the same group of firms before the crisis.

Additionally, the most recent strand of economic literature on exports has also pointed toward the importance of fixed cost that firms incur to penetrate in foreign markets (see Albornoz *et al.*, forthcoming). Exporting is associated with the need of external finance because of firms might finance sunk and fixed cost in order to enter and learn in the functioning of foreign markets opportunities, making specific investments, market research, regulatory adaptation, and even set up and maintain its customer network. This reason justifies that exporters also need for working capital finance in cross-border transactions which are longer than domestic sales (see Bricongne *et al.*, 2012; Chor and Manova, 2012; Djankov *et al.*, 2010; Manova, 2010; Manova *et al.*, 2011). To solve liquidity constraints, firms ought to rely on bank financing or export letters of credit. Therefore, the second part of our research is motivated by the existing relationship between firm export activities and liquidity management. Summarizing, we focus our attention both on external and internal trade finance.

Let us present the most relevant literature that links financial constraints and liquidity constraints, in the first step; and then we discuss the literature applied to the case of exporters. The seminal paper presented by Fazzari *et al.* (1988) and Fazzari and Petersen (1993) who demonstrate that financial constraints are related to cash flow sensitivities. This argument is in line with those presented by Kaplan and Zingales, (1997, 2000) who suggest that higher cash flow sensitivity cannot be interpreted as evidence that a firm is financially constrained including in their sample 49 low

dividends firms as financial constraints criterion, and Cleary (1999, 2006) demonstrates that cash flow sensitivity need not identify liquidity constrained firms. In particular, we also find authors whom establish that maintain certain level of liquidity is determinant especially when capital markets are imperfects (see Blanchard *et al.*, 1994; Kim *et al.*, 1998; Lins *et al.*, 2010; Yun, 2009). In this vein, Almeida *et al.* (2004, 2010) demonstrate employing several financial constraints criteria that financially constrained firms tend to save more cash than non-financially ones. The level of sensitivity is affected by the future level of investment opportunities captured partly by cash flow. The cash flow could be interpreted in the light of external financing, in sense that cash holding plays an important role into balance the external and internal financial constraints (see Pal and Ferrando, 2010). On the other hand, firms with credit rating access more easily to financial markets and then, need to hold lesser level of cash flow than constrained ones (see Bigelli and Sánchez-Vidal, 2012; Opler *et al.*, 1999). Denis and Sibilkov (2010) support those results and demonstrate that greater cash holding is associated with higher level of investment for constrained firms whilst value is also stronger than for unconstrained ones, and Bigelli and Sánchez-Vidal (2012) show that more cash is also held by firms with a longer cash conversion cycles and lower financing deficits, as predicted by the hierarchy theory. The authors report evidence that dividend payments are associated with more cash holding, and bank debt and net working capital represent good cash substitutes.[2] Constrained firms also burned on through cash, and drew more heavily on lines of credit for fear banks would restrict credit access in the future, and sold more assets in to fund their operations (see Campello *et al.*, 2010). Additionally, Gatchev *et al.* (2009, 2010) develop a dynamic multi-equation model where firms make financing and investment decision jointly, and

---

[2] See also Faulkender and Wang (2006) and Pinkowitz *et al.* (2006).

argues that firms increase investment when cash flow rises and decrease when cash flow falls. Moreover, firms insulate capital expenditures from cash flow fluctuations by changing net debt. When cash flow are low (high), firm increase (reduce) debt and reduce (increase) cash balance. Chor and Manova (2012) show that credit condition play a determinant role as a channel through which the economic crisis affected trade volumes, as well as exports of more external financial vulnerable firms are more sensitive to the cost of external capital than exports of less vulnerable industries. This storyline and the motivation presented above lead us to present the second question of our research: Could liquidity management, i.e. the length of time in which firms manage the current assets and liabilities, be a determinant factor for export activities?

As we have pointed out, the drop in trade is a consequence of trade finance drying up, the recovery would be a persistent as the underlying shock, and therefore it would also be linked to the recovery of trade credit. Moreover, the inclusion of inventories as a complementary concept in our analysis constitutes a relevant question since goods traded internationally could be more volatile than production or domestic sales themselves. The inventory explanation would lead to a drop in trade which is pronounced but shorter-lived relative to shocks. Since inventories play an important role in the trade downturn, once the inventory adjustment is over, trade should be also recovered. Some authors appoint that the drop in inventories should not be particular of financial crisis, but would be robust with to more general shock during economic crises. In this line, Alessandria *et al.*, (2010, 2011) show that the gap between sales and international trade can be partially explained because inventory levels had become larger than the rate of sales. The authors employ an sS model of inventory adjustment in a two-country general equilibrium model where inventory holding are different from domestic and imported products due to international frictions. Ding *et al.* (forthcoming)

analyse the linkages between investment in fixed, and working capital and financial constraints. The authors, who also use the CCC as liquidity management indicator, find that an active management of working capital might help firms to alleviate financial constraints.[3] Caglayan *et al.* (2012) show that the inventory decline as firms hold more liquid assets or extend more trade credit indicates that financially less constrained firms could respond to demand shocks more efficiently. This result implies that financially stronger firms could adapt to changes in demand more easily than constrained ones by altering production chain, and therefore financially less constrained firms could respond better to demand shocks. Claessens *et al.* (forthcoming) isolate and compare effects from changes in business cycles, international trade, and external financing conditions on firms' profits, capital expenditures, and sales. The authors also use the CCC as measure of external finance for working capital, suggesting that crisis reduces significantly availability of working capital and then, reduces the amount of firms' sales.

3. Methodology and data

3.1. Theoretical framework

In this section we develop a theoretical structure which allows us to analyse the main relationships between firm characteristics and determinants that relate firm exports, liquidity management and financial constraints. In our model, firms finance the fixed cost of market entry throughout internally generated funds as well as external credit. Access to external credit is costly and depends on firm specific factors related to the availability of collateral, or the cost of credit. Therefore, we should consider financial constraints as firm specific. First, firms differ with regard to their customer

---

[3] See also Bougheas *et al.* (2009) who identifies the response of account payable and receivable to changes in investories.

structure, and then, the probability of trade default or liquidity shocks are also considered as firm specific. Second, the ability of their management and the different skills between firm's managers constitutes a set of determinant factors in searching for trade credit or trade debit conditions, i.e. implicit interest rates paid by firm or collection period, and even bank credit terms. Third, firms' production and organization structure affects the ability of outside lenders to extract soft versus hard information about creditworthiness of firms. These reasons affect the availability of firms' assets which could serve as collateral to banks or customers. Differences in trade credit structure imply that firms also differ in their need to rely on external finance, and this argument could be a condition to invest in better management in working capital in order to mitigate the effects of financial constraints.

We follow Melitz (2003) and Constantini and Melitz (2007) to consider a model in which each firm in an industry produces a set of ω of a consumption good.[4] There exist a continuum of ω ∈ Ω. The firm competes in a Dixit and Stiglitz's (1977) monopolistic environment, and consumers whom has a preference for variety, maximizes the utility function for total expenditure of E. The parameter σ > 1 represents the elasticity of substitution. The consumer's utility function of a representative consumer is given by

$$U = \left[\int_{\omega \in \Omega} \left(s(\omega) \right)^{\frac{\sigma-1}{\sigma}} d\omega \right]^{\frac{\sigma}{\sigma-1}} \tag{1}$$

Maximizing the utility function presented above, we could derive the demand function for the firm

$$s_i = \frac{E p_i^{-\sigma}}{P^{1-\sigma}} \tag{2}$$

---

[4] See Arkolakis *et al.* (2012) for a broad literature review on trade models.

where p_{it} represents the price at which the firm sells the set of individual varieties ω, and P represents the overall price index, with i represents the individual subscript.

The election between become in an export firm or domestic oriented, the firm should consider iceberg transportation costs which reduces firm's revenues from exporting by a factor τ ∈ [0, 1) where zero represents that the firm is purely domestic oriented and, on the other hand, one represents that the whole revenues is consumed by iceberg cost. The firm produces at a constant marginal cost c/φ, where φ > 1 and captures firm's productivity. The firm has an initial endowment of working capital represented as w_i which also depends on the firm demand, and is associated with the working capital opportunity cost r_i which is different between firms. Alternatively, the firm uses external capital, which could be more costly due to asymmetries of information. We capture financial constraints throughout the parameter γ ∈ [0, 1] that reaches the value 1 if the firm is purely financially constrained and 0 otherwise.

Revised the set of factors that could influence in firm export decision, we could formulate the firm's profit function as

$$\pi_i = (1-\tau)p_i s_i - \frac{\gamma c}{\varphi} s_i - (1-\gamma)r_i w_i s_i \tag{3}$$

Firms set prices to maximize profits, and then we obtain the first order conditions as

$$\frac{\partial \pi_i}{\partial p_i} = (1-\tau)s_i + \left((1-\tau)p_i - \frac{\gamma c}{\varphi} - (1-\gamma)r_i w_i \right)\frac{ds}{dp} \tag{4}$$

where the derivative of firm demand is given as $\frac{ds}{dp} = (-\sigma)\frac{E p_i^{-\sigma-1}}{P^{1-\sigma}}$.

Note that the price index is the same for the whole firms and therefore does not change if a single firm modifies the selling price, because of we consider a continuum of firms. Solving for the optimal price we obtain:

$$p_i^* = \frac{\sigma}{\sigma-1}\left(\frac{\frac{\gamma c}{\varphi}+(1-\gamma)r_i w_i}{(1-\tau)}\right) \tag{5}$$

Then, we could determine the optimal quantity sold by the firm:

$$s_i^* = \frac{E}{P^{1-\sigma}}\left[\frac{\sigma}{\sigma-1}\left(\frac{\frac{\gamma c}{\varphi}+(1-\gamma)r_i w_i}{(1-\tau)}\right)\right]^{-\sigma} \tag{6}$$

Finally, inserting (5) and (6) into (3) and rearranging, we could obtain the optimal total profit expressed as

$$\pi_i^* = E\left(\frac{\sigma}{1-\tau}\right)^{-\sigma}\left(\frac{\frac{\gamma c}{\varphi}+(1-\gamma)r_i w_i}{(\sigma-1)P}\right)^{1-\sigma} \tag{7}$$

We could extract several conclusions from our theoretical outline. The equation (6) represents the existing relationship between the volume of firm's sales (s_i^*), and financing constraints and working capital value, as we explained above. The first result shows the existing negative relationship between financial constraints parameter (γ) and firm's sales which reveals the existing negative theoretical relationship between credit constraints and firm's exports. This result theoretically reinforces the existence of our first hypothesis. Moreover, we could see that the value of working capital presents positive sign which means that an increase in working capital investment leads to an increase on firm's export intensity. This theoretical result is in line with our second hypothesis. In turn, Equation (7) shows the existing optimal relationships between firm's optimal profits (π_i^*) and the operating costs, including marginal costs and iceberg cost as a part of exporting costs, elasticity of demand, firm productivity, financial constraints, and the value of working capital which constitute important factors that determine the decision of the firm to become in an exporting firm. The importance of

π_i^* lies in that if firm obtains profits derived from export activities, as we will explain below, the firm will enter in export markets.

Revisited the corporate finance literature on firm exports, trade finance, and financial constraints and considering the theoretical framework presented above, we can formulate the following testable hypothesis:

Hypothesis 1: *We expect positive relationship between liquidity management indicators, i.e. CCC and NTC and firm export activity.*

Hypothesis 2: *We expect negative relationship between firm financial constraints and firm export activity.*

3. 2. Empirical approach

In this section we report information about the dataset that we use in our research, as well as the empirical specification which be estimated to test our empirical hypotheses. Our model highlights a number of features of the firm and banking structure related to the extensive and intensive margin, financial constraints, and liquidity management.

3. 2. 1. Data

The data for our research come from the 2009 version of the *Business Environment and Enterprise Performance Survey* (BEEPS hereafter), developed jointly by the World Bank and the European Bank for Reconstruction and Development. The main objective of the survey is to obtain feedback for enterprises worldwide. The survey universe was defined as commercial, service or industrial business establishments with at least five full-time employees. Government departments including military, police, education, health and similar activities were excluded, as were those in primary

industries including agriculture, mining, etc. Three levels of stratification were used in all countries: industry, establishment size and region.

The survey employed in our research was carried out between 3,354 firms from Greece, Germany, Ireland, Portugal, and Spain. Beeps also includes questions related to balance sheets and income statement data as well as information on financial products and services employed in firm financing e.g. checking account, credit and debit card use, or line of credits. Additionally, the survey includes a broad sets of questions related to information related to the access to external capital markets and financial constraints.

3.2.2. Financial constraint criteria: survey measures and disequilibrium model

The BEEPS survey ask to the entrepreneur whether the most recent loan application were always approved, sometimes approved or denied, or were always denied, among other interesting questions on the explicative reasons for why the loan has been denied and the collateral backed the loan.[5] We consider as first criterion that the firm is financially constrained if the entrepreneur responded that the loan were always denied; we consider that the firm is partially constrained if the loan were only sometimes denied; and finally, we consider that the firm is not financially constrained if the loan has been always approved. This constitutes a direct identification criterion because of the firm reports at first hand its financial status (see Danielson and Scott, 2004).[6]

---

[5] We consider the following three questions:
q47a: *If your firm does not currently have a loan, what was the reason?*
q47b: *If your firm did not apply for a loan, what were the main reasons?*
q47c: *If the loan application of your firm was rejected, what were the main reasons?*
[6] Campello *et al.* (2010) use a survey of CFO for Asia, Europe, and the U.S. in a similar way to characterize the firm in financially constrained or unconstrained. In a similar line, Lins *et al.* (2010) also use survey data to study how firms manage cash and lines of credit.

We also consider as alternative financing constraint criterion the disequilibrium model which is based on parametric estimations. Ogawa and Suzuki (2000), Atanasova and Wilson (2004), Atanasova (2007), Shikimi (2005), Carbó and López (2009) and Carbó *et al.*, (2009, 2012) carry out a financial disequilibrium model from which divide the firms in the sample in financially constrained or unconstrained.[7] They construct two reduced equations for loan demand, loan supply, which minimize the level of desired bank loan availability for firms .First, on the demand side represents the level of firm activity, firm's size, the availability of internal funds, the bank interest rate paid by the firm, substitutes of bank loans, and gross domestic product. The supply side represents the maximum amount of bank credit available for the firm and is modelled as the value of firm's collateral, the ability to set the bank price and the firm's risk assumed. Based on the estimates of the disequilibrium model we compute the probability that loan demand exceeds loan supply, and therefore to classify the sample into constrained firms and unconstrained firms (see Gersovitz (1980).

The equation considered to estimate our disequilibrium model is given as

$$L_i^d = \varphi_0 + \varphi_1 S_i + \varphi_2 CFA_i + \varphi_3 TC_i + \varphi_4 r_i^B + \varphi_5 LGDP_h$$
$$L_i^s = \gamma_0 + \gamma_1 COLD_i + \gamma_2 AUDIT_i + \gamma_3 RE_i + \gamma_4 r_i^B + \gamma_5 LGDP_h$$
$$L_i^* = \min\left(L_i^d, L_i^s\right)$$

(8)

where L_i^d represents the firm's bank loans demand measured as loan applied, L_i^s, the firm's bank loans availability (supply) measured as loan granted, both directly from the survey. Firm activity is represented by the ratio total sales over total assets (S_i) which is expected to increase the loan demand. We should consider the substitutability of bank loans as source of financial funds; therefore we include in our regression the ratio

---

[7] Disequilibrium model was pioneered by Fair and Jaffee (1972) and Fair and Kelejian (1974). See also the Maddala (1983) Ch. 10 for a more complete view of the disequilibrium model.

between cash flow over total assets (CFA_i) to control for the generation of internal funds, the ratio trade credit over total assets (TC_i) as rival funds of bank financing. We proxy the cost of bank credit (r_i^B) as the bank interest rate, measured as the interest rate that entrepreneurs declare to pay for bank loans.

In the supply side, we include the firm's availability of collateral ($COLD_i$) proxied as a dummy variable that takes on the value 1 if the entrepreneur responds affirmatively to collateral be required, and zero otherwise[8]. We expect that this variable presents a positive sign because of the maximum level of bank loan available by the firm would be increased with the level of collateral. We should also consider the firm's default risk and the presence of information asymmetry, therefore we include the audit dummy ($AUDIT_i$) that controls for the impairment risk.[9] This variable takes on the value 1 if the entrepreneur responds affirmatively whether the firm's financial statement were checked by an external auditor, and zero otherwise[10]. We also include the ratio of retained earnings over total working capital (RE_i) as profits accumulated by the firm. The expected sign of the above variables are expected to be positive since those factors increase the maximum availability of bank credit. Both functions we include the logarithm of gross domestic product ($LGDP_h$) to control for macroeconomic conditions.

We find in the economic literature other more indirect methodologies based on financial ratios or econometric estimations, although there is no consensus of which measures is better to proxy for the financial constraints. Fazzari *et al.* (1988, 2000) argue that financially constrained firms are likely to have lower payout ratio than the unconstrained ones. Following this approach, Almeida and Campello (2007) and Almeida *et al.* (2004) classify constrained (unconstrained) firms those firms in the top

---

[8] Question q46a: *Thinking of the most recent loan you obtained from a financial institution, did the financing require collateral?*
[9] Question q.49: *Does your firm have its annual financial statement checked and certified by an external auditor?*
[10] Question q49: *Does your firm have its annual financial statement checked by an external auditor?*

(bottom) three deciles. The second criterion is based on firm's size under the hypothesis that smaller firms would be more vulnerable to capital market imperfection than the larger ones. This framework was employed by Gilchrist and Himmelberg (1995), Erickson and Whited (2000, 2012), and Acharya *et al.* (2007). Other authors have classified the firms following financial ratings. Whited (1992), and Almeida *et al.* (2004) firms are classified as financially constrained if they have debt outstanding or its debt is in default following the Standard & Poor's (S&P) Long-term Senior Debt Rating available on Compustat database. Following a similar line, Denis and Sibilkov (2010) construct a similar criterion using the S&P Short-term Debt Rating available on Compustat. Firms are classified as financially constrained if they have short term debt rated outstanding, but have never had their short-term debt rated before. Recently, Bhaumik *et al.* (2012) propose the use of the stochastic frontier approach to modelling firm financial constraints. The authors argue that the main advantage of the stochastic frontier methodology over the stylized approaches or approaches which uses pooled OLS, or panel data regression models, is that the stochastic frontier could decide whether or not the average firms are financially constrained, but also estimates the degree of the constraints of the firms for each time of period, as well as the marginal impact of firm characteristics on this measure.

3.2.3. The factors that affect the export trade margins

The second part of our research attempt to demonstrate that both liquidity management and financial constraints are influent factors on the export condition of firms. Several papers have explored the determinants that influence on the decision to export by the firm. Bernard and Jensen (1995, 1999, 2004) and Roberts and Tybout (1997) modelize the export decision throughout a logit model in which the dependent

variable identifies whether the firm decides to export or not. Taking into account the equations (6) and (7) we could formulate that the firm would decide to export if the profits, or at least expected profits, are strictly greater than zero. Therefore we propose a probit model in which we create a bivariate dummy variable (EXP_i) that takes on the value 1 if the firm realizes exporting activities and 0 otherwise:

$$EXP_i = \begin{cases} 1 \; if \; \pi_i^* > 0 \\ 0, otherwise \end{cases}$$

Then, we propose the following probit specification:

$$\Pr(EXP_i = 1) = \Phi(\alpha_1 + \alpha_2 CCC_i + \alpha_3 FC_i + \alpha_4 SIZE_i + \alpha_5 AGE_i + \alpha_6 LEV_i + \alpha_7 ROA_i$$
$$+\alpha_8 CFA_i + \alpha_9 SGROWTH_i + \alpha_{10} AUDIT_i + \alpha_{11}\sum_{k=1}^{K} IND_{ik} + \alpha_{12}\sum_{h=1}^{H} Country_{ih} + \varepsilon_i) \qquad (9)$$

Based on the results obtained from estimating the specification (9) we estimate whether firm financial constraints, as well as liquidity management exert influence on the proportion of firms' exports over the volume of firms' total sales. Hence, we propose the following empirical specification:

$$EXPORTS_i = \alpha_1 + \alpha_2 CCC_i + \alpha_3 FC_i + \alpha_4 SIZE_i + \alpha_5 AGE_i + \alpha_6 LEV_i + \alpha_7 ROA_i + \alpha_8 CFA_i$$
$$+ \alpha_9 SGROWTH_i + \alpha_{10} AUDIT_i + \alpha_{11} MILLS_i + \alpha_{12}\sum_{k=1}^{K} IND_{ik} + \alpha_{13}\sum_{h=1}^{H} Country_{ih} + \varepsilon_i \qquad (10)$$

3.2.4. Variables

The dependent variables are as follows. The variable EXP_i represents the probability of firm being an exporter and it is measured as a dummy variable which takes on the value 1 if the firm has in its balance sheet selling to foreign markets and 0 otherwise. On the other hand, the variable $EXPORTS_i$ represents the ratio of export sales over firm's total sales[11].

---

[11] The firm intensive margin is measured thorough export intensity which is reported in question *s8: What percentage of your total sales such exports represents?* Nevertheless, extensive margin are measured if

According to the economic literature, and previous studies on liquidity management, we explain the firm characteristic that might explain the level of CCC_i and how that might affect this level. We define the CCC_i following Soenen (1993), Deloof (2003), and Padachi (2006) measuring the quality of liquidity management. Taking the considerations explained above we define the dependent variable of our model as:

$$CCC_i = \left(\frac{AR_i}{SALES_i}\right) \times 365 + \left(\frac{INV_i}{PURCH_i}\right) \times 365 - \left(\frac{AP_i}{PURCH_i}\right) \times 365$$

(11)

where AR_i represents the firm's account receivables registered in firm's current assets, and $SALES_i$ which represents the firm's level of sales. The second term is composed of INV_i that represents the firm's level of inventories in its balance sheet and $PURCH_i$ the firm's purchases. Finally, the ultimate term contains AP_i which means the amount of account payables registered in the firm's current liabilities. The longer the cycle, the larger the funds invested in working capital, so it might be sensitive to market imperfection such as asymmetric imperfection, agency conflicts, or financial distress. As robustness test, we substitutes CCC_i for the net trade cycle as the dependent variable.

$$NTC_i = \left(\frac{AR_i + INV_i - AP_i}{SALES_i}\right) \times 365$$

(12)

The NTC is basically equal to the CCC_i referring to the numerators but measured as percentage of sales, this makes the NTC_i more easily to compute.[12]

EXPORTS$_i$ > 0, i.e., the firm declares to realize export activities. Alternatively, we could have used the question *s7: Does your firm currently sell its products or services directly to customers outside the country?* but this variable only includes direct exports whilst we are concerned to include both direct and indirect firm's exports.

[12] Shin and Soenen (1998) argue that the NTC is a better working capital efficiency measure comparing with the CCC and other indicators as weighted cash conversion cycle or the operating cycle because the indicator is possible to estimate the financing needs of working capital as a function of sales growth.

Firm size ($SIZE_i$) might be one of the variables which influence the decision to export and it is related to self-selection hypothesis. Firm size is proxied by the logarithm of the total number of firm's workers plus one. This variable is expected to maintain a positive relationship between exports and firm's size; because of larger plants have more resources to enter in foreign markets. This constitutes an important question whether the firm affront sunk cost which benefits larger firms. Scale might be important in order to overcome such sunk cost as gathering information or economies of production or marketing. Financial constraints (FC_i) are one of the topics related with firm size. Whited (1992) and Fazzari and Petersen (1993) show that small firms are more likely to be financially constrained than larger ones, and therefore being obliged to accept trade credit when bank credit is unavailable. Therefore, the cost of funds invested in current assets is higher for small firms than for the largest ones, so they might have lower accounts receivable and inventories.

Firm age (AGE_i) is measured by the number of years from when the firm constitution. Firm's maturity might lead to stronger local linkages and greater local sourcing. Older firms may have accumulated sufficient experience to establish and expand their distribution networks and also to position themselves to export markets. In addition, we should consider knowledge stock accumulated over the years in foreign markets. Relatively younger firms ought to be more capable to adapt more recent technology, while older firms ought to use more obsolete physical capital. Therefore, we included age in order to capture potential changes in the quality of the firm, as models of learning suggest.

We might control for firm leverage (LEV_i) measured as firm bank debt over total assets. Following the pecking order theory (see Myers, 1984; Myers and Majluf, 1984) a company short of funds would tend to raise capital inside before issuing new stocks or

borrowing money from outside. Increasing debt means less availability of internal funds, and then higher debt ratio is due to fewer funds for current operations. Nevertheless, trade literature identifies exporters, particularly starters in export markets, as more leveraged firms. This variable is useful to control for the link between internal and external resources and the expansion to foreign markets.

Although there no clear evidence of the effect of exporting on a firm's performance, it is reasonable to understand that export activity could be one of the major sources for firm growth. Until recently, there is very limited empirical research examining the direct linkage between export activity and performance demonstrating the existence of positive relationship between firm export intensity and financial profitability. Therefore, we expected positive relationship between export activities on firm performance. We include return to assets (ROA_i) measured as the ratio profit before taxes over total assets.

Investments of some companies might be constrained by shortage of internal funds. Fazzari and Petersen (1993) demonstrated the sensitivity of cash flow to working capital investment for US firms. This result is in line with Myers (1984) and Myers and Majluf (1984) pecking order theory whom found that when external sources of funds suppose a higher cost for the firm, it makes firm give priority to internal generated funds over debt and new equity. Therefore, we include in our model the ratio cash flow over total assets (CFA_i) considering the capacity for firm to generate internal resources, according to previous economic literature.

Firm's side and industry position constitutes two factors that determine the relative position in market relative to competitors in order to gain the strongest possible competitive advantage. Then, firms attempt to implement growth strategies as many as were possible in order to increase firm's profits. Those are market penetration, product

development, market development and diversification. We introduce in our specification the growth of sales ($SGROWTH_i$) measure as the variation rate of firm's rate.[13]

Information asymmetry constitutes an important handicap for firms to obtain bank credit. We include audit dummy ($AUDIT_i$) as a proxy of information verifiability and then as a control of firm information asymmetry. This variable takes on the value 1 if the firm presents audited statements, and zero otherwise.

Finally, we introduce in our specification the inverse Mill's ratio ($MILLS_i$) based on the probit regression from expression (9) in order to capture the self-selection effect into export markets. We also consider industry (IND_{ik}) and country ($Country_{ih}$) dummies to control for industry sector and geographic fixed effect, respectively. The subscripts k and h represents industry and country, respectively.

4. Results

In this section we report the main results obtained from our research. Generally, we do find that there exists positive relationship among liquidity management indicators and firm export activity. In a second step, we decompose liquidity management indicators and we do find a twofold direction depending on the side where the component is located. On the one hand, collection period and inventory period, allocated in the current assets of the firm's balance sheet, is found to be positive. On the other hand, credit period, identified in the current liabilities, are found to be negatively related to firm export activities. Financial constraints are also found to be negatively related with firms' export activity. We realize a screening exercise considering two criteria to classify firms as finally constrained or unconstrained. First, we consider as main criterion the entrepreneur's responses and as

---

[13] Question q.55: *Over the last 36 months how have the following changed (increased/decrased) and what is the percent of change for your company, in real terms (i.e., after allowing for inflation).*

second, we estimate a disequilibrium model for bank credit market. Moreover, we filter our data eliminating those observations with possible zero bank debt in order to exclude possible false non-financially constrained firms into our disequilibrium model.

4. 1. Summary statistics and comparison tests between exporters and non-exporters

We report in table 2 the summary statistics for the variables used in our econometric analysis to control for the possible existence of outliers. Focusing on our export measurements, we observe for the $EXPORTS_i$ that proportion of foreign sales over domestic sales represents the 7.22% in average. Regarding to the value obtained for EXP_i, the estimated mean makes us consider that the 21.78% of our sample could be considered as export firms.

Regarding to our liquidity management variables, we observe that the average period of CCC_i are 15.86 days, ranging from -266.33 to 231.67 days, which means that on average, the period related to the maturity of current assets are higher than the maturity period of trade credit. Those results are consistent with those presented for the robust indicator NTC_i which shows that the average period ascends to 19.03 days ranging from -240.71 days to 231.67 days. The decomposition of liquidity management indicators reveals that the average collection period (COL_PERIOD_i) ascends to 47.82 days ranging from 1 to 294.95 days; the average inventory period (INV_PERIOD_i) represents 22.76 days ranging from 1 to 250 days, and finally, the average credit period (CRED_PERIODi) ascends to 37.30 days ranging from 1 to 243.33 days.

The second sets of interest variables for our research are those related with the firm's financial constraints status. Following our first criterion correspond to classify firms into constrained or unconstrained taken directly the response from questionnaire (FC_i), we obtain that the 56.53 percent of SME contained in our sample are financially constrained. The second criterion employed corresponds to the estimation of the

disequilibrium model. Table 4 shows the results for disequilibrium model represented in equation (8). After computing the disequilibrium model we construct a dummy variable ($DIFLOAN_i$) in order to classify firms in constrained or unconstrained ones. The mean value shows that this criterion classifies as financially constrained the 38.16 percent of our sample. The pairwaise correlation between FC_i and $DIFLOAN_i$ are 68.89% significant at 1% level, which means that the adjustment of our disequilibrium model correctly identifies and discriminate between financially constrained firms and non-financially constrained ones.

We perform in table 3 the two-tailed test for comparison of means and the Kolmogorov-Smirnov test in order to visualize the differences in the distribution functions between export firms and non-export ones. For liquidity management variables, i.e. CCC_i and NTC_i, both the Kolmogorov-Smirnov test and test for means allows us to reject the null and confirms that there exists differences among both groups for exporters and non-exporters firms being higher CCC_i and NTC_i for the first group of firms. Moreover, the Kolmogorov-Smirnov test rejects the null for the three components of the liquidity management variables, whilst the two-tailed tests suggest that inventory period is higher for export firms, and the collection and credit period are higher for non exporter ones. Regarding to constrained variables, i.e. FC_i and $DIFLOAN_i$, the results are quite ambiguous since both Kolmogorov-Smirnov test and test for means rejects the null but the sign is negative indicating that exporter would be more financially constrained than non-exporters. Regarding to the other variables, we do find that exporters are higher in size, older and have best level of liquidity than non-export firms.

4. 2. Financial constraints and the probability of being an export firms

In this section we analyze the effect of our liquidity management variables and financial constraints variables on the probability of being an export firm. Table 5 shows the marginal effects for the probit model proposed in equation (9). The overall probability of becoming

in an export firm is between 36.87 to 37.78 percent. We obtain positive and significant coefficients at 1% level for CCC_i which reveals that an increase in the length among current assets and current liabilities could increase the probability of becoming in an exporter firm in 0.161%. We find similar results whether we substitute the former indicator for NTC_i as a measure of liquidity management. Our results show that there exists positive and significant relationship between NTC_i and export status, indicating that the probability of becoming in an exporter is over 0.201%. Those results help to confirm our hypothesis 1. We are also concerned to study the components of CCC_i as it is shown in table 6. Hence, we substitute in our empirical specification both CCC_i and NTC_i for their components: COL_PERIOD_i, INV_PERIOD_i, and $CRED\_PERIOD_i$. We have not been able to obtain significant relationship between COL_PERIOD_i and export status but we could assert that there exist positive relationship among them. However, we do find positive and significant relationship at 1% level when the variable INV_PERIOD_i is included in our specification revealing that the higher the period in which stocks are maintained in warehouse, the higher the probability of being an export firm (0.204%). On the other hand, the results are the opposite when $CRED\_PERIOD_i$ are considered because of we obtain negative and significant coefficient at 1% level which means that an increase in the delay in payments of trade credit, firms diminish the probability of being an export firm (-0.102%).

We also find that financial constraints decrease the probability of exporting. The coefficient for FC_i is negative and statistically significant which represents a decrease in probability of 13.34%. Moreover, we find very similar results when we consider the dummy variable estimated from the disequilibrium model ($DIFLOAN_i$) obtaining a decrease of probability around 10.35%.

Finally, the firm characteristic variables conserve the expected signs. We do find that $SIZE_i$ show a positive probability meaning that an increase in firm's number of employees increase the probability of becoming in exporter of around 0.062% as expected.

The firm's leverage (LEV_i) is other of the relevant variables for the probability of being an exporter since we do find that the most leveraged firms have a lower probability of being an export firm.

4. 3. Financial constraints, liquidity management, and the volume of firm exports

In this section we analyze the effects of CCC_i, NTC_i and financial constraints on the percentage of firm's sales to foreign markets, i.e. the intensive margin. Following economic literature in exporting, self-selection hypothesis considers that export firms which enter in foreign markets previously have certain requirements, i.e. firms self-select into export markets. Then, we introduce in our specification the inverse Mill's ratio ($MILLS_i$) to control for self-selection. We show the main estimations of the equation (10) in table 7. The results reveal that the coefficient for CCC_i and NTC_i are positive and statistically significant al 1% level which means that the higher the length of time measured by CCC_i (0.213) or NTC_i (0.226), the firm would increase the proportion of sales designated to foreign markets. We could observe that the coefficients are very similar for both kinds of liquidity management measures. Since we are also concerned to explore the causes in determining the evolution of liquidity management variables employed in this research, we also introduce separately each addend of CCC_i into our empirical specification as it is showed in table 8. The results reveal positive relationship between the components related to current assets and firm's exports. This fact could induce to believe that the higher the collection period (0.078) or inventory period (0.195), the firm could be encouraged to search foreign markets. Nevertheless, we do find the opposite sign when we consider credit period into our specification (-0.053). Therefore, our results lead us to conclude that firms with longer credit period find more difficulties in enter to exports markets. This result constitutes an important finding since the effect of current assets on exports is higher than the effect of current liabilities on the dependent variable.

The results obtained for financial constraints variables are in line with our hypothesis 2. According with our expectations, we have obtained negative and statistically significant relationship between financial constraints and export intensity. We obtain a coefficient for FC_i of -12.893 whether we consider CCC_i as explanatory variable, and alternatively for NTC_i we obtain -11.908. Moreover, the results are similar when we consider $DIFLOAN_i$, obtaining -10.308 and -10.457 for CCC_i and NTC_i, respectively. This fact demonstrates that results are robust. Following our results, we could conclude that there exist direct relationship between financial constraints status and the proportion of firm's production designated to exports.

4. 4. Robustness test: the effects of firm exports on liquidity management

Once we have investigated the effects of liquidity management and financial constraints on firm exports, we are also concerned to study the effects of exports and financial constraints on liquidity management, as well as on the three components of the CCC. The results of the GLM regression are showed in tables 9 and 10. The variable $EXPORTS_i$ presents positive sign and statistically significant at 1% level with respect to CCC_i and NTC_i, consistent with the results showed in table 7, which demonstrates the robustness of our results, suggesting that the higher the percentage of firm's sales are designated to foreign markets, the higher the CCC_i and NTC_i. Moreover, we do also find positive and significant relationship between export intensity and collection period (0.007) and inventory period (0.039). Moreover, the negative and statistically significant relationship with respect to credit period is also maintained (-0.007).

The second set of variables of interest for our research is those related with financial constraints. We show positive relationship and statistical significance at 1% level between financial constraints variables and liquidity management suggesting that the presence of financial constraints leads to an increment on liquidity cycles. Therefore, the results are

consistent with our second hypothesis and we are able to demonstrate that financial constraints increase both CCCi and NTCi. Regarding to the components of CCCi, the results show that financial constraints increase collection and inventory period, whilst decreases credit period.

5. Conclusions

This paper develops a twofold new approach to research the relationships between firm export sales: financial constraints and firm liquidity management. Unlike the main strand of the corporate financial literature which estimates firm financial constraints employs parametric techniques such as Euler equations, Tobin's q specifications, cash flow sensitivity analysis, and disequilibrium models, we use survey data analysis and consider as the main financial constraint criterion the direct entrepreneur's response from the questionnaire. Moreover, we compare the dummy variable created from the response obtained directly from the questionnaire with the estimation of the disequilibrium model as additional methodological contribution in order to contribute to the debate on financial constraints and short term investment behaviour.

These relationships are tested employing data from 2009 *Business Environment and Enterprise Performance Survey* (BEEPS) obtained from the World Bank and the European Bank for Reconstruction and Development. We have analyzed the firm export behaviour from a twofold perspective: on the one hand, considering whether the firm is an exporter firm and, on the other hand, considering the amount of firm's sales to foreign markets. We do find that there exits positive relationship between firm export behaviour and liquidity management indicators CCC and NTC. We are concerned to study the causes of the direction of the sign. We do find that when the collection period is increased, or even the inventory period, encourages firms to search new markets in order to improve their liquidity position. In contrast, credit period acts inversely because of delays in payments to creditors

difficult the access to foreign markets. Regarding to financial constraints, we have also found that there exist a negative relationship between financial constraint and exports which means that financial constraints constitutes a several problem for firm that decides to enter in foreign markets.

The results have important implications for academics, policy makers and entrepreneurs since our results may help to explain the important role in which the firm's exporting character might boost the access to loan markets, and then reducing the financial constraints. This fact could influence on firm's liquidity position increasing the collection period and as well as increase the credit period because of the firm have access to a broad market or simply, throughout better trade credit conditions.

Table 1:
Definition of variables

Variable	Definition
Dependent variables	
Export status (EXP$_i$)	This variable represents the export status. This dummy takes on the value one if the firm realizes export activities, i.e. EXPORTS$_i$ > 0, and zero, otherwise.
Export intensity (EXPORTS$_i$)	This variable is defined as the percentage of sales designated to foreign markets over firm's total sales.
Firm characteristics	
Cash Conversion Cycle (CCC$_i$)	This indicator measures the quality of working capital management. The cash conversion cycle is computed as the sum of tree indicators: account receivables over sales plus inventories over purchases minus account payables over purchases, and multiplied by 365.
Net Trade Cycle (NTC$_i$)	This variable is used as robustness check for working capital management. The NTC is basically equal to CCC where account receivable, inventories, and account payable are weighted by sales. Shin and Soenen (1998) argue that NTC is a good working capital efficiency measure.
Collection Period (COL_PERIOD$_i$)	Collection period is the number of days that firm requires for collecting trade credit and indicates the effectiveness with which a firm manages granting credit and collects from customers. Collection period is measured as *debtors* over the ratio *operating revenue* to *turnover* over 365 days. Hence, firm's collection period is measured in number of days.
Inventory period (INV_PERIOD$_i$)	Inventory period represents the number of days that firm accumulates stocks in the warehouse. Inventory period is measured directly from the question *q17*: *At the time you receive delivery of your most important input or supply, how many days of stock do you typically have on hand?*
Credit Period (CRED_PERIOD$_i$)	Credit period results when the firm's customer is granted trade credit to it customers and it is measured as number of days. Credit period is measured as *creditors* over the ratio *operating revenue* to *turnover* over 365 days.
Financial constraints (FC$_i$)	This dummy variable takes on the value one if the entrepreneurs respond affirmatively that firms are financially constrained.
Disequilibrium model (DIFLOAN$_i$)	This dummy takes on the value one if the loan demand is higher than loan supply.
Firm size (SIZE$_i$)	This variable represents the firm's size measured al logarithm of employees plus one.
Firm age (AGE$_i$)	This variable controls for the firm age measured as the year of survey minus foundation date.
Leverage (LEV$_i$)	We measure the firm's leverage as the ratio total debt over total assets. We are concerned in this paper the influence that could be resulted of the variations in long-term debt on short-term funds, and inventories.

Firm profitability (ROA$_i$)	This indicator is computed as the ratio of profit before taxes over total assets. It also controls for firm quality.
Firm liquidity (CFA$_i$)	This variable is computed as the ratio cash flow (net income plus depreciation plus changes in deferred taxes) over total assets.
Sales (S$_i$)	Total sales over total assets during the year.
Sales growth (SGROWTH$_i$)	This variable measures the variation in % of sales over the last 36 months.
Auditors (AUDIT$_i$)	This dummy variable control for firm firm's risk. This dummy variable takes on the value 1 if the firm audits its financial statements.
Trade credit (TC$_i$)	We are concerned in firm financing constraints; therefore, this is one of the key variables in our research. This variables proxy for the financial constraints taken directly from the response of the entrepreneurs registered in BEEPS.
Bank interest rate paid (r$_i^B$)	This indicator control for the interest rate the firm might pay for the bank loans. This variable is measured directly from the response of the entrepreneur.
Collateral requirements (COLD$_i$)	This variable measure the value of the collateral required as a percentage of the loan value. This dummy variable takes on the value 1 if the firm was required to presents collateral, and zero, otherwise.
Inverse Mill's Ratio (MILLS$_i$)	This variable captures the self-selection process affecting firms to enter in foreign markets. MILLS$_i$ are computed as the ratio standard normal density (pdf) over cumulative standard normal distribution (cdf) for each probit specification.

Macroeconomic variables	
LGDP$_h$	Logarithm of GDP for country *h* where the firm is locatede.

Industry dummies	
Construction	This dummy variable takes on the value one if the firm is contained at Division C: Construction, and zero otherwise. The mayor SIC code groups included ranges from 15 to 17.
Manufacturing	This dummy variable takes on the value one if the firm is contained at Division D: Manufacturing, and zero otherwise. The mayor SIC code groups included ranges from 20 to 39.
Transports	This dummy variable takes on the value one if the firm is contained at Division E: Transportation, Communications, Electric, Gas, and Sanitary Services, and zero otherwise. The mayor SIC code groups included ranges from 40-49.
Wholesale	This dummy variable takes on the value one if the firm is contained at Division F: Wholesale Trade, and zero otherwise. The mayor SIC code groups included ranges from 50 to 51.
Real Estate	This dummy variable takes on the value one if the firm is contained at Division F: Wholesale Trade, and zero otherwise. The mayor SIC code groups included ranges from 6512 to 6553.
Hotels	This dummy variable takes on the value one if the firm is contained at Division I: Services, and zero otherwise. The mayor SIC code groups included ranges from 70 to 80.

Table 2:
Descriptive statistics

Variable	Observations	Mean	S.D.	Min	Max
Dependent variables					
EXP	3,352	0.2078116	0.4058017	0	1
EXPORTS	3,352	7.218079	19.49123	0	100
Firm characteristics					
CCC	1,962	15.85704	34.69401	-236.3333	231.6667
NTC	2,006	19.0253	28.14317	-240.7143	231.6667
COL_PERIOD	2,234	47.82084	58.25536	1.00375	294.9495
INV_PERIOD	2,876	22.7646	24.39703	1	250
CRED_PERIOD	1,903	37.30132	48.31012	1.00375	243.3333
FC	3,354	0.5652952	0.4957921	0	1
DIFLOAN	3,354	0.3816339	0.4858599	0	1
SIZE	2,946	2.94832	1.617642	1.098612	9.392745
AGE	3,314	19.21062	15.1175	4	100
LEV	991	34.62462	26.39043	1	100
ROA	2,503	1.399656	1.405965	-9.8	5.96
CFA	1,731	42.73499	34.94201	0.0769231	149.5
S	2,562	3.441785	2.895428	0.0024	12.92072
SGROWTH	1,943	13.2177	8.006785	1	38
AUDIT	3,325	0.638797	0.4804215	0	1
TC	490	25.10878	24.81579	0.5	96.9
r^B	1,727	6.341517	2.694836	0.4	14.7
COLD	3,354	0.4087657	0.4916791	0	1
Macroeconomic variables					
LGDP	3,354	4.639121	0.1445496	4.369448	4.762174
Industry dummies					
Construction	3,354	0.1508646	0.3579703	0	1
Manufacturing	3,354	0.2265951	0.4186909	0	1
Transport	3,354	0.0703637	0.2557972	0	1
Wholesale	3,354	0.2516398	0.43402	0	1
Real Estate	3,354	0.1499702	0.3570954	0	1
Hotels	3,354	0.0933214	0.2909257	0	1
Others	3,354	0.0494931	0.2169276	0	1

Table 3:
Parametric test for comparison of means and two-sample Kolmogorov-Smirnov test for equality of distribution functions by export dummy.

	Parametric test for comparison of means		Kolmogorov-Smirnov
	Mean differences are reported. Diff = mean (0) − mean (1) under H_0: Diff = 0 t-statistics in parenthesis. Standard errors are reported.		Diff: F(z) − G(z) under H_0: Diff = 0
Variable	**Coefficient (t-statistics)**	**Standard errors**	**Coefficient [p-value]**
CCC	-14.55934*** (-7.7859)	1.86996	0.2265 [0.000]
NTC	-14.04719*** (-9.4603)	1.484851	0.2409 [0.000]
COL_PERIOD	30.95776††† (10.1438)	3.051889	0.3256 [0.000]
INV_PERIOD	-12.49953*** (-11.4487)	1.091784	0.2260 [0.0000]
CRED_PERIOD	21.67913††† (8.2971)	2.612856	0.2617 [0.000]
FC	-0.1557338*** (-7.4406)	0.0209304	0.1557 [0.000]
DIFLOAN	-0.0742566*** (-3.5977)	0.0206399	0.0743 [0.005]
SIZE	-1.689143*** (-26.1405)	0.0646178	0.4381 [0.000]
AGE	-10.37573*** (-13.0817)	0.7931483	0.2401 [0.000]
COLD	-0.072607*** (-3.4757)	0.0208898	0.0726 [0.006]
LEV	4.84205††† (2.5286)	1.91493	0.0889 [0.101]
ROA	0.2385337††† (3.4362)	0.0694177	0.0964 [0.001]
CFA	-13.67497*** (-6.9063)	1.980065	0.1832 [0.000]
SGROWTH	-0.0456671 (-0.1061)	0.4303606	0.0305 [0.905]
AUDIT	-0.2385679*** (-11.8598)	0.0201157	0.2386 [0.000]

Notes: *, **, *** statistically significant at the 10, 5 and 1% level, respectively under Ho: Diff. < 0
†, ††, ††† statistically significant at the 10, 5 and 1% level, respectively under Ho: Diff. > 0

Table 4:
Estimated parameters for disequilibrium model

Seemingly unrelated regression model.
t-statistics are in parenthesis (White (1980) heterokedastic-robust standard errors)
Standard errors are reported

	Coefficient	Standard error
Demand for bank loans (L^d)		
Intercept	145.0474*** (2.72)	53.34457
S	-0.0082405 (-0.16)	0.0516376
CFA	-0.0000117 (-0.05)	0.0002537
TC	0.020272 (1.16)	0.0174467
r^B	-1.591107*** (-3.51)	0.4538036
LGDP	-22.20672* (-1.93)	11.48151
Supply for banks loans (L^s)		
Intercept	138.8198*** (3.03)	45.84593
COLD	-1.388059 (-1.10)	1.263786
r^B	-1.399281*** (-3.16)	0.3928683
AUDIT	-2.297941** (-2.16)	1.063658
Retained over WK	-0.121491*** (-6.31)	0.0192591
LGDP	-19.64209** (-1.98)	9.898538
Breusch-Pagan Test [*p-value*]	331.755 [0.0000]	

Equation	Obs	Parms	RMSE	R-sq	F-stat	p-value
L^d	454	5	22.68297	0.0518	4.67	0.0003
L^s	454	5	21.24063	0.1685	14.94	0.0000

Notes: *, **, *** statistically significant at the 10, 5 and 1% level, respectively.

Table 5:
The probability of becoming in an export firm

Probit regression reporting marginal effects.
Dependent variable: EXP
z-statatisitics in parenthesis.

Variable	(1)	(2)	(3)	(4)
CCC	0.0016054***	0.0016888***		
	(3.39)	(3.61)		
NTC			0.0020095***	0.0020008***
			(3.40)	(3.40)
FC	-0.1334413***		-0.148731***	
	(-3.97)		(-4.43)	
DIFLOAN		-0.1035394***		-0.1107313***
		(-3.14)		(-3.37)
SIZE	0.0518967***	0.0457264***	0.0520019***	0.0449637***
	(4.54)	(4.09)	(4.52)	(3.99)
AGE	0.0006209	0.0003945	0.0006186	0.0003822
	(0.75)	(0.47)	(0.75)	(0.45)
LEV	-0.0017542**	-0.0026553***	-0.0017353**	-0.0027132***
	(-2.21)	(-3.29)	(-2.17)	(-3.34)
ROA	-0.0004885	-0.0006137	-0.0004792	-0.0006128
	(-0.82)	(-1.04)	(-0.79)	(-1.03)
CFA	0.0000105	9.46e-06	0.000011	9.97e-06
	(1.19)	(1.08)	(1.24)	(1.13)
SGROWTH	-0.0035171***	-0.0038021***	-0.0035852***	-0.0039044***
	(-3.44)	(-3.67)	(-3.44)	(-3.70)
AUDIT	-0.1296707***	-0.1323319***	-0.1349307	-0.1386961***
	(-3.45)	(-3.52)	(-3.60)	(-3.70)
Obs	913	913	913	913
Predicted value	0.36870033	0.37310893	0.37266363	0.37789367
Wald test	120.45***	114.80***	123.33***	116.48***
Log-pseudolikelihood	-557.28719	-559.97279	-558.4889	-562.3345

Notes: *, **, *** statistically significant at the 10, 5 and 1% level, respectively.

Table 6: The probability of becoming in an export firm. Analysis for the components of CCC

Probit regression reporting marginal effects.
Dependent variable: EXP
z-statatisitics in parenthesis.

Variable	(1)	(2)	(3)	(4)	(5)	(6)
COL_PERIOD	0.0017324			0.0001348		
	(0.84)			(0.06)		
INV_PERIOD		0.0020392***			0.0019003***	
		(3.53)			(3.28)	
CRED_PERIOD			-0.0010866***			-0.001795***
			(-2.66)			(-4.37)
FC	-0.1487187***	-0.1377906***	-0.1380093***			
	(-4.86)	(-4.51)	(-3.97)			
DIFLOAN				-0.0998537***	-0.0970263***	-0.0922126***
				(-3.32)	(-3.27)	(-3.73)
SIZE	0.0567264***	0.049655***	0.0557903***	0.0484515***	0.043107***	0.047859***
	(5.52)	(4.84)	(3.69)	(4.87)	(4.29)	(3.23)
AGE	0.0004028	0.000925	0.0003908	0.0002028	0.0007451	0.0002123
	(0.54)	(1.21)	(0.39)	(0.27)	(0.98)	(0.19)
LEV	-0.0013582*	-0.0013857*	-0.0013999	-0.0022581***	-0.0022233***	-0.0022313**
	(-1.85)	(-1.87)	(-1.38)	(-3.01)	(-2.96)	(-2.07)
ROA	-0.0002385	0.0001512	-0.0002428	-0.0003503	0.0001591	-0.0003402
	(-0.47)	(0.81)	(-0.91)	(-0.69)	(0.82)	(-1.24)
CFA	0.0000127	9.97e-06	0.0000123***	0.000012	9.41e-06	0.0000115***
	(1.51)	(1.16)	(7.07)	(1.42)	(1.11)	(5.26)
SGROWTH	-0.0028113***	-0.00453***	-0.0028041***	-0.003088***	-0.0047617***	-0.0030165***
	(-3.34)	(-4.75)	(-3.38)	(-3.58)	(-4.92)	(-3.64)
AUDIT	-0.1234541***	-0.1555385***	-0.1204624***	-0.1269362***	-0.1590127***	-0.1221102***
	(-3.68)	(-4.53)	(-11.83)	(-3.78)	(-4.61)	(-9.87)
Observations	1,064	1,088	1,064	1,064	1,088	1,064
Predicted value	0.36307435	0.35622644	0.36234663	0.36849137	0.36072512	0.36704732
Wald test	141.37***	161.10***	141.51***	130.81***	153.16***	131.57***
Log-pseudolikelihood	-654.92099	-657.8538	-654.68104	-660.64556	-662.43329	-659.28717

Notes: *, **, *** statistically significant at the 10, 5 and 1% level, respectively.

Table 7:
Volume of firm export over total sales. Estimated parameters GLM

Dependent variable: EXPORTS
z-statistics in parenthesis. White (1980) heterokedastic-robust standard errors. GLM regression.
The whole regressions include industry and country dummies.

Variable	(1)	(2)	(3)	(4)
Intercept	-61.03626***	-55.2774***	-46.04745***	-53.19896***
	(-4.19)	(-3.98)	(-2.84)	(-3.11)
CCC	0.212652***	0.2257843***		
	(3.29)	(3.47)		
NTC			0.2243522***	0.2507399***
			(2.86)	(3.05)
FC	-12.89264***		-11.90842**	
	(-2.88)		(-2.50)	
DIFLOAN		-10.308***		-10.45759**
		(-2.80)		(-2.17)
SIZE	9.709207***	9.163255***	8.741319***	8.821338***
	(5.68)	(6.20)	(4.40)	(4.88)
AGE	0.0202445	-0.0034357	0.0085384	-0.0061967
	(0.60)	(-0.12)	(0.24)	(-0.20)
LEV	-0.2229583***	-0.3197369***	-0.185865***	-0.3094885***
	(-3.43)	(-3.47)	(-2.62)	(-2.72)
ROA	-0.0336704	-0.0476692	-0.0232115	-0.0437271
	(-1.15)	(-1.50)	(-0.79)	(-1.28)
CFA	0.0008442**	0.0007637**	0.0007153*	0.0007705*
	(2.37)	(2.41)	(1.72)	(1.96)
SGROWTH	-0.4303088***	-0.4737992***	-0.3636855**	-0.4610603***
	(-3.19)	(-3.37)	(-2.35)	(-2.64)
AUDIT	-13.26589***	-13.72441***	-11.23076**	-13.53912**
	(-3.04)	(-3.18)	(-2.16)	(-2.44)
MILLS	56.79847***	58.595***	46.57483**	55.55498**
	(3.17)	(3.34)	(2.28)	(2.56)
Obs	912	912	912	912
AIC	8.582967	8.577693	8.581017	8.576986
BIC	266232	265387.6	266291.3	265195.8
Wald's test	285.51***	281.42***	286.22***	283.44***
Log-pseudolikelihood	-3,892.83293	-3,891.427998	-3,892.943604	-3,891.105708

Notes: *, **, *** statistically significant at the 10, 5 and 1% level, respectively.

Table 8: Volume of firm export over total sales. Analysis for the components of CCC

Dependent variable: EXPORTS
z-statistics in parenthesis. White (1980) heterokedastic-robust standard errors. GLM regression.
The whole regressions include industry and country dummies.

Variable	(1)	(2)	(3)	(4)	(5)	(6)
Intercept	-19.98803***	-42.82899***	-34.34985***	-42.38437***	-49.1233***	-49.04466***
	(-3.71)	(-3.23)	(-2.64)	(-6.05)	(-3.83)	(-6.90)
COL_PERIOD	0.0789087***			0.079345***		
	(4.29)			(5.19)		
INV_PERIOD		0.195085***			0.2113487***	
		(2.94)			(3.46)	
CRED_PERIOD			-0.053232*			-0.1595304***
			(-1.82)			(-4.98)
FC	-2.564568*	-8.989142*	-6.891421**			
	(-1.77)	(-1.96)	(-2.82)			
DIFLOAN				-5.546689***	-7.654965**	-6.583171***
				(-3.69)	(-2.26)	(-5.47)
SIZE	5.422789***	7.768597***	7.252794***	7.67479***	7.943822***	8.384755***
	(5.80)	(4.82)	(3.95)	(8.99)	(5.85)	(8.64)
AGE	-0.0525995***	0.0263998	-0.0405971***	-0.0458382***	0.0237403	-0.0429641***
	(-6.94)	(0.66)	(-5.38)	(-5.15)	(0.68)	(-5.38)
LEV	-0.0509613*	-0.1109994**	-0.100104*	-0.1762399***	-0.2007069**	-0.2118395***
	(-1.71)	(-2.13)	(-1.88)	(-4.56)	(-2.59)	(-4.97)
ROA	0.0275858***	0.0453073***	0.0195459*	0.0090389	0.0488739***	0.0044604
	(3.99)	(5.94)	(1.94)	(0.95)	(6.06)	(0.47)
CFA	-0.0001231	0.000407	0.0002239	0.000385**	0.0004986	0.0005055***
	(-0.83)	(1.06)	(0.72)	(2.54)	(1.40)	(3.18)
SGROWTH	-0.0252901	-0.3814006**	-0.1273027*	-0.1979777***	-0.481594***	-0.2454425***
	(-0.94)	(-2.18)	(-1.77)	(-4.16)	(-2.70)	(-5.48)
AUDIT	-0.8653691	-10.51334**	-4.846978	-7.1632***	-12.9281***	-8.78336***
	(-0.67)	(-2.11)	(-1.49)	(-3.74)	(-2.62)	(-4.79)
MILLS	6.168278	35.7049**	24.26522*	33.7202***	43.89235***	42.3377***
	(1.30)	(2.10)	(1.78)	(3.96)	(2.65)	(5.48)
Obs	1,063	1,087	1,063	1,063	1,087	1,063
AIC	8.76541	8.625206	8.765651	8.764828	8.622835	8.764821
BIC	376,153.2	333,625.7	376,245.6	375,930.2	332,818	375,927.2
Wald's test	11,029.35***	398.66***	37,832.09***	59,299.77	393.37***	518,26.39
Log-pseudolikelihood	-4,637.815406	-4,666.799443	-4,637.94355	-4,637.506183	-4,665.510827	-4,637.502121

Notes: *, **, *** statistically significant at the 10, 5 and 1% level, respectively.

Table 9:
Robustness check: Liquidity management and exports

Dependent variables are cash conversion cycle (CCC) and net trade cycle (NTC)
z-statistics in parenthesis. White (1980) heterokedastic-robust standard errors. GLM regression.
The whole regressions include industry and country dummies.

Variable	Model 1 Dependent variable: CCC	Model 2 Dependent variable: CCC	Model 3 Dependent variable: NTC	Model 4 Dependent variable: NTC
Intercept	289.1433***	331.7005***	266.2585***	321.7042***
	(30.35)	(3.12)	(40.73)	(38.51)
EXPORTS	0.0651984***	0.0793621***	0.0453297***	0.0606559***
	(2.96)	(3.12)	(2.76)	(2.96)
FC	67.83801***		70.66385***	
	(24.96)		(36.97)	
DIFLOAN		52.1127***		54.36165***
		(24.55)		(42.32)
SIZE	-26.82766***	-22.53559***	-24.99185***	-21.68435***
	(-26.99)	(-24.01)	(-39.38)	(-39.32)
AGE	-0.3051826***	-0.1686212***	-0.2899238***	-0.1672294***
	(-16.13)	(-11.53)	(-19.18)	(-13.34)
LEV	0.9374587***	1.354799***	0.8509721***	1.343975***
	(29.11)	(25.91)	(39.43)	(41.23)
ROA	0.2607263***	0.3119103***	0.2329651***	0.3000686***
	(19.54)	(20.98)	(26.41)	(31.22)
CFA	-0.0050742***	-0.0043012***	-0.0049581***	-0.0044358***
	(-18.70)	(-18.86)	(-21.94)	(-24.17)
SGROWTH	2.021573***	2.09004***	1.898542***	2.084012***
	(24.34)	(21.82)	(32.17)	(32.75)
AUDIT	66.09616***	63.66349***	63.74662***	64.99106***
	(27.93)	(24.32)	(46.04)	(46.00)
MILLS	-288.5321***	-276.9067***	-266.4257***	-269.5213***
	(-30.22)	(-26.79)	(-41.11)	(-41.10)
Obs	912	912	912	912
AIC	7.400745	7.52904	6.981761	7.157788
BIC	77414.98	88,843.48	48,952.13	59,544.06
Wald's test	3,651.42***	3,224.46***	3,952.14***	4,196.84***
Log-pseudolikelihood	-3,353.739507	-3,412.242023	-3,163.683038	-3,243.951115

Notes: *, **, *** statistically significant at the 10, 5 and 1% level, respectively.

Table 10: Robustness check: Liquidity management and exports

Dependent variables are collection period, inventory period, and credit period
z-statistics in parenthesis. White (1980) heterokedastic-robust standard errors. GLM regression.
The whole regressions include industry and country dummies.

Variable	Collection period		Inventory period		Credit period	
Intercept	135.6197***	11.34235***	199.3557***	209.6911***	-276.3301***	-199.759***
	(4.84)	(3.93)	(34.53)	(32.14)	(-29.37)	(-29.70)
EXPORTS	0.0076457***	0.0083469**	0.0399734***	0.0535904***	-0.0077601*	-0.0094517
	(1.75)	(2.13)	(2.60)	(2.91)	(-0.61)	(-1.18)
FC	46.01086***		63.47773***		-84.81286***	
	(5.98)		(36.60)		(-11.05)	
DIFLOAN		1.34899***		47.71758***		-42.83128***
		(4.31)		(35.50)		(-28.36)
SIZE	-17.72478***	-1.159751***	-23.02457***	-20.9001***	35.34207***	22.07583***
	(-6.18)	(-4.60)	(-36.23)	(-33.31)	(11.31)	(29.24)
AGE	-0.1252393***	-0.0110479*	-0.4116724***	-0.3339958***	0.2398979***	0.0820426***
	(-4.27)	(-1.86)	(-22.04)	(-19.17)	(10.52)	(10.32)
LEV	0.4309303***	0.0413153***	0.6612081***	1.115477***	-0.9285496***	-1.063118***
	(5.70)	(4.06)	(32.86)	(33.01)	(-11.65)	(-30.01)
ROA	0.0712475***	0.0059983***	-0.0734833***	-0.0847213***	-0.1515088***	-0.1525498***
	(5.59)	(2.66)	(-21.66)	(-20.11)	(-8.94)	(-20.76)
CFA	-0.0034546***	-0.0002758***	-0.0043819***	-0.0043035***	0.0067227***	0.0044972***
	(-4.46)	(-4.21)	(-16.17)	(-18.61)	(9.48)	(18.79)
SGROWTH	0.9397535***	0.0640245***	2.426559***	2.6889***	-1.936182***	-1.509761***
	(5.09)	(4.00)	(42.58)	(43.60)	(-11.66)	(-29.95)
AUDIT	37.98737***	2.533168***	70.70177***	75.13917***	-75.98631***	-55.61182***
	(6.01)	(5.73)	(40.05)	(36.57)	(-11.62)	(-30.21)
MILLS	-169.2466***	-12.49046***	-250.8129***	-264.7689***	347.099***	253.0028***
	(-4.49)	(-3.91)	(-36.75)	(-34.20)	(11.75)	(31.83)
Obs	1,063	1,063	1,087	1,087	1,063	1,063
AIC	5.826371	6.512908	7.039984	7.250696	6.839991	5.938786
BIC	13,027.44	33,049.1	62,435.11	78,827.77	48,645.95	15,441.37
Wald's test	75.51***	23.41***	4,033.23***	3,669.00***	290.59***	1,359.38***
Log-pseudolikelihood	-3,075.716167	-3,440.610706	-3805.231111	-3,919.753285	-3,614.455356	-3,135.464714

Notes: *, **, *** statistically significant at the 10, 5 and 1% level, respectively.

References
(Essay II: Firm Exports, Liquidity Management, and Financial Constraints)

Acharya, Viral V.; Heitor Almeida and Murillo Campello. 2007. Is Cash Negative Debt? A Hedging Perspective on Corporate Financial Policies. Journal of Financial Intermediation 16, 515-554.

Ahn, JaeBin; Mary Amiti and David E. Weinstein. 2011. Trade Finance and the Great Trade Collapse. American Economic Review 101, 298-302.

Albornoz, Facundo; Héctor F. Calvo Pardo; Gregory Corcos and Emanuel Ornelas, forthcoming. Sequential Exporting. Journal of International Economics.

Alessandria, George; Joseph P. Kaboski and Virgiliu Midrigan. 2011. US Trade and Inventory Dynamics. American Economic Review 101, 303-307.

Alessandria, George; Joseph P. Kaboski and Virgiliu Midrigan. 2010. The Great Trade Collapse of 2008-09: An Inventory Adjustment? IMF Economic Review 58, 254-294.

Almeida, Heitor and Murillo Campello. 2007. Financial Constraints, Assets Tangibility, and Corporate Investment. Review of Financial Studies 20, 1429-1460.

Almeida, Heitor; Murillo Campello and Michael S. Weisbach. 2010. Corporate Financial and Investment Policies when Future Financing is Not Frictionless. Journal of Corporate Finance forthcoming, .

Almeida, Heitor; Murillo Campello and Michael S. Weisbach. 2004. The Cash Flow Sensitivity of Cash. Journal of Finance 59, 1777-1804.

Amiti, Mary and David E. Weinstein. 2011. Exports and Financial Shocks. The Quarterly Journal of Economics 126, 1841-1877.

Arkolakis, Costas; Arnaud Costinot and Andrés Rodríguez-Clare. 2012. New Trade Models, Same Old Gains?? American Economic Review 102, 94-130.

Atanasova, Christina V. 2007. Access to Institutional Finance and the use of Trade Credit. Financial Management 36, 49-67.

Atanasova, Christina V. and Nicholas Wilson. 2004. Disequilibrium in the UK Corporate Loan Market. Journal of Banking and Finance 28, 595-614.

Bellone, Flora; Patrick Musso; Lionel Nesta and Stefano Schiavo. 2010. Financial Constraints and Firm Export Behaviour. World Economy 33, 347-373.

Bems, Rudolfs; Robert C. Johnson and Kei-Mu Yi. 2011. Vertical Linkages and the Collapse of Global Trade. American Economic Review 101, 308-312.

Bernard, Andrew B. and J. Bradford Jensen. 2004. Why some Firms Export. Review of Economics and Statistics 86, 561-569.

Bernard, Andrew B. and J. Bradford Jensen. 1999. Exceptional Exporters Performance: Cause, Effect, Or both? Journal of International Economics 47, 1-25.

Bernard, Andrew B. and J. Bradford Jensen. 1995. Exporters, Jobs, and Wages in US Manufacturing: 1976-1987. Booking Papers on Economic Activity, Microeconomics 67-119.

Bhaumik, Sumon Kumar; Pranab Kumar Das and Subal C. Kumbhakar. 2012. A Stochastic Frontier Approach to Modelling Financial Constraints in Firms: An Application to India. Journal of Banking & Finance 36, 1311-1319.

Bigelli, Marco and Javier Sánchez-Vidal. 2012. Cash Holdings in Private Firms. Journal of Banking & Finance 36, 26-35.

Blanchard, Olivier J.; Florencio Lopez-de-Silanes and Andrei Shleifer. 1994. What do Firms do with Cash Windfalls? Journal of Financial Economics 36, 337-360.

Bougheas, Spiros; Simona Mateut and Paul Mizen. 2009. Corporate Trade Credit and Inventories: New Evidence of a Trade-Off from Accounts Payable and Receivable. Journal of Banking and Finance 33, 300-307.

Bricongne, Jean-Charles; Lionel Fontagné; Guillaume Gaulier; Daria Taglioni and Vincent Vicard. 2012. Firms and the Global Crisis: French Exports in the Turmoil. Journal of International Economics 87, 134-146.

Caglayan, Mustafa; Sara Maioli and Simona Mateut. 2012. Inventories, Sales Uncertainty, and Financial Strength. Journal of Banking & Finance 36, 2512-2521.

Campa, José Manuel and J. Myles Shaver. 2002. Exporting and Capital Investment: On the Strategic Behavior of Exporters.

Campello, Murillo; John R. Graham and Campbell R. Harvey. 2010. The Real Effects of Financial Cosntraints: Evidence from a Financial Crisis. Journal of Financial Economics 97, 470-487.

Carbó, Santiago and Rafael López. 2009. Bank-Lending Channel and Non-Financial Firms: Evidence for Spain. Spanish Economic Review forthcoming, .

Carbó, Santiago; Francisco Rodriguez and Gregory F. Udell. 2012. Trade credit, the financial crisis and firms' access to finance. Mimeo.

Carbó, Santiago; Francisco Rodriguez and Gregory F. Udell. 2009. Bank Market Power and SME Financing Constraints. Review of Finance 13, 309-340.

Chor, Davin and Kalina Manova. 2012. Off the Cliff and Back? Credit Conditions and International Trade during the Global Financial Crisis. Journal of International Economics 87, 117-133.

Claessens, Stijn; Hui Tong and Shang-Jin Wei, forthcoming. From the Financial Crisis to the Real Economy: Using Firm-Level Data to Identify Transmission Channels. Journal of International Economics.

Cleary, Sean. 2006. International Corporate Investment and the Relationship between Financial Constraint Measures. Journal of Banking and Finance 30, 1559-1580.

Cleary, Sean. 1999. Relationship between Firm Investment and Financial Status. Journal of Finance 54, 673-692.

Constantini, James A. and Marc J. Melitz. 2007. The Dynamics of Firm-Level Adjustment to Trade Liberalization. Priceton University.

Danielson, Morris G. and Jonathan A. Scott. 2004. Bank Loan Availability and Trade Credit Demand. Financial Review 39, 579-600.

Deloof, Marc. 2003. Does Working Capital Management Affect Profitability of Belgian Firms? Journal of Business Finance and Accounting 30, 573-588.

Denis, David J. and Valeriy Sibilkov. 2010. Financial Constraints, Investment, and the Value of Cash Holdings. Review of Financial Studies 23, 247-269.

Ding, Sai; Alessandra Guariglia and John Knight, forthcoming. Investment and Financing Constraints in China: Does Working Capital Management make a Difference? Journal of Banking & Finance.

Dixit, Avinash K. and Joseph E. Stiglitz. 1977. Monopolistic Competition and Optimum Product Diversity. American Economic Review 67, 297-308.

Erickson, Timothy and Toni M. Whited. 2012. Treating Measurement Error in Tobin's q. Review of Financial Studies 25, 1286-1329.

Erickson, Timothy and Toni M. Whited. 2000. Measurement Error and the Relationship between Investment and q. Journal of Political Economy 108, 1027-1057.

Fair, Ray C. and Dwight M. Jaffee. 1972. Methods of Estimation for Markets in Disequilibrium. Econometrica 40, 497-514.

Fair, Ray C. and Harry H. Kelejian. 1974. Methods of Estimation for Markets in Disequilibrium: A further Study. Econometrica 42, 177-190.

Faulkender, Michael and Rong Wang. 2006. Corporate Financial Policy and the Value of Cash. Journal of Finance 61, 1957-1990.

Fazzari, Steven M. and Bruce C. Petersen. 1993. Working Capital and Fixed Investment: New Evidence on Financing Constraints. RAND Journal of Economics 24, 328-342.

Fazzari, Steven M.; R. Glenn Hubbard and Bruce C. Petersen. 2000. Investment-Cash Flow Sensitivities are Useful: A Comment on Kaplan and Zingales. The Quarterly Journal of Economics 115, pp. 695-705.

Fazzari, Steven M.; R. Glenn Hubbard and Bruce C. Petersen. 1988. Financing Constraints and Corporate Investment. Brooking Papers on Economic Activity. 1, 141-206.

Gatchev, Vladimir A.; Paul A. Spindt and Vefa Tarhan. 2009. How do Firms Finance their Investments? the Relative Importance of Equity Issuance and Debt Contracting Cost. Journal of Corporate Finance 15, 179-195.

Gatchev, Vladimir; Todd Pulvino and vefa Tarhan. 2010. The Interdependent and Intertemporal Nature of Financial Decisions: An Application to Cash Flow Sensitivities. Journal of Finance 65, 725-763.

Gersovitz, Mark. 1980. Classification Probabilities for the Disequilibrium Model. Journal of Econometrics 14, 239-246.

Gilchrist, Simon and Charles P. Himmelberg. 1995. Evidence on the Role of Cash Flow for Investment. Journal of Monetary Economics 36, 541-572.

Greenaway, David and Richard Kneller. 2007. Industry Differences in the Effect of Export Market Entry: Learning by Exporting? Review of World Economics 143, 416-432.

Greenaway, David and Richard Kneller. 2004. Exporting and Productivity in the United Kingdom. Oxford Review of Economic Policy 20, 358-371.

Greenaway; David; Alessandra Guariglia and Kneller Richard. 2007. Financial Factors and Exporting Decisions. Journal of International Economics 73, 377-395.

Greenaway, David; Joakim Gullstrand and Richard Kneller. 2005. Exporting may no always Boost Firm Productivity. Review of World Economic 141, 561-582.

Iacovone, Leonardo and Veronica Zavacka. 2009. Banking Crises and Exports. Lessons from the Past. The Word Bank Policy Research Working Paper 5016.

Kaplan, Steven N. and Luigi Zingales. 2000. Investment-Cash Flow Sensitivities are Not Valid Measures of Financing Constraints. Quarterly Journal of Economics 115, 707-712.

Kaplan, Steven N. and Luigi Zingales. 1997. Do Investment-Cash Flow Sensivities Provide Useful Measures of Financing Constraint? The Quarterly Journal of Economics. 112, 169-215.

Kim, C. S.; D. Mauer and A. Sherman. 1998. The Deteminants of Corporate Liquidity: Theory and Evidence. Journal of Financial and Quantitative Analysis 33, 335-359.

Levchenko, Andrei A.; Logan T. Lewis and Linda L. Tesar. 2011. The "Collapse in Quality" Hypothesis. American Economic Review 101, 293-297.

Lins, Karl V.; Henri Servaes and Peter Tufano. 2010. What Drives Corporate Liquidity? an International Survey of Cash Holdings and Line of Credit. Journal of Financial Economics 98, 160-176.

Maddala, G. S. 1983. Limited-Dependent and Qualitative Variables in Econometrics. Cambridge University Press. Cambridge.

Manova, Kalina. 2010. Credit Constraints, Heterogeneous Firms, and International Trade. NBER Working Paper 14531.

Manova, Kalina; Shang-Jin Wei and Zhiwei Zhan. 2011. Firm Exports and Multinational Activity under Credit Constraints. NBER Working Paper 16905.

Melitz, Marc J. 2003. The Impact of Trade on Intra-Industry Reallocations and Aggregate Industry Productivity. Econometrica 71, 1695-1725.

Muûls, Mirabelle. 2008. Exporters and Credit Constraints. A firm Level Approach. London School of Economics. Mimeo.

Myers, Stewart C. 1984. The Capital Structure Puzzle. Journal of Finance 39, 575-592.

Myers, Stewart C. and Nicholas S. Majluf. 1984. Corporate Financing and Investment Decisions when Firms have Information that Investors do Not have. Journal of Financial Economics 13, 187-221.

Ogawa, Kazuo and Kazuyuki Suzuki. 2000. Uncertainty and Investment: Some Evidence from the Panel Data of Japanese Manufacturing Firms. Japanese Economic Review 51, 170-192.

Opler, Tim; Lee Pinkowitz; Rene Stulz and Rohan Williamson. 1999. The Determinants and Implications of Corporate Cash Holdings. Journal of Financial Economics 52, 3-46.

Padachi, Kesseven. 2006. Trend in Working Capital Management and its Impact on Firms' Performance: An Analysis of Mauritanian Small Manufacturing Firms. International Review of Business Research Papers 2, 45-58.

Pal, Rozalia and Annalisa Ferrando. 2010. Financing Constraints and Firms' Cash Policy in the Euro Area. European Journal of Finance 16, 153-171.

Park, Albert; Dean Yang; Xinzheng Shi and Yuan Jiang. 2010. Exporting and Firm Performance: Chinese Exporters and the Asian Financial Crisis. The review of economics and statistics 92, 822-842.

Pinkowitz, Lee; Rene Stulz and Rohan Williamson. 2006. Does the Contribution of Corporate Cash Holdings and Dividends to Firms Value Dependent to Firms Value Depend on Governance? A Cross-Country Analysis. Journal of Finance 61, 2725-2751.

Roberts, Marks and James Tybout. 1997. The Decision to Export in Colombia: An Empirical Model of Entry with Sunk Cost. American Economic Review 87, 545-564.

Shikimi, Masayo. 2005. Do Firms Benefit from Multiple Banking Relationships? Evidence from Small and Medium-Sized Firms in Japan. Discussion Papers Series No. 70.

Shin, Hyun Han and Luc Soenen. 1998. Efficiency of Working Capital and Corporate Profitability. Financial Practice and Education 8, 37-45.

Simeon Djankov; Caroline Freund and Cong S. Pham. 2010. Trading on Time. The Review of Economics and Statistics 92, 166-173.

Smith, K. 1980. Profitability versus Liquidity Tradeoffs in Working Capital Management. In: K.V.Ed. Smith (Ed.), Readings on the management of working capital. West Publishing Company, 549-562.

Soenen, Luc A. 1993. Cash Conversion Cycle and Corporate Profitability. Journal of Cash Management 13, 53-57.

Whited, Toni M. 1992. Debt, Liquidity Constraints, and Corporate Investment: Evidence from Panel Data. Journal of Finance 47, 1425-1460.

Wu, Wenfeng; Oliver M. Rui and Chongfeng Wu, forthcoming. Trade Credit, Cash Holdings, and Financial Deepening: Evidence from a Transitional Economy. Journal of Banking & Finance.

Yun, Hayong. 2009. The Choice of Corporate Liquidity and Corporate Governance. Review of Financial Studies 22, 1447-1475.

Essay III:
Monetary policy, implicit interest rate,
and relative net trade credit

Monetary policy, implicit interest rate, and relative net trade credit

   This paper investigates the effects of monetary policy on the implicit interest rate of trade credit as well as the probability the firm becomes net trade borrower. We also construct the implicit interest rate as the difference between creditors and debtors over the sum of both. Our results show that a tightening in monetary policy leads to: (i) increase interest rate of trade credit, (ii) become firms in trade borrowers, (iii) generate divergence in the cost of trade credit among firms of the same industry sector, and (iv) create a complementarity effect in prices between trade and bank financing (99 words).

1. Introduction and motivation

The global financial crisis and the demand downturn have supposed a reduction in the volume of trade credit for firms. Research on trade credit is a relevant question considering the importance of this kind of finance in crisis times, since a delay, or even delinquency, in payments or lack of availability, supposes an increase of financial pressure for firms in order to affect their investment decisions (see Carbó *et al.*, 2012). For a financing point of view, trade credit supposes a via of transmission of perturbations because of delinquencies in this kind of instruments. Trade credit is one of the most important financial sources due to facilitate trade between firms and supports the economic activity (see Demirgürç-Kunt and Maksimovc, 2001; Petersen and Rajan, 1997; Rajan and Zingales, 1998). Trade credit permits to sellers delay the payment to their customers depending on the needs of the former and, on the other hand, customers are able to operate without liquidity restrictions (see Braun and Raddatz, 2008; Raddatz, 2006, 2010) although we have also shown authors who demonstrate that trade credit could be an expensive form of firm finance (see Carbó *et al.*, 2012; Ng *et al.*, 1999).

The relevance of trade credit has also led to several non-financial and financial theories. In this line, non-financial theories advocates that trade credit allows for price discrimination as a competitiveness tool (see Brennan *et al.*, 1988; Ng *et al.*, 1999; Pike *et al.*, 2005). Other authors show that trade credit serves as warranty for product quality (see Deloof and Jegers, 1996, 1999; Emery and Nayar, 1998; Long *et al.*, 1993; Klapper *et al.*, 2012). We also find sound arguments supporting that trade credit induce certain levels of relationship-specific investment to ease the credit constraints of trade partners (see Dass, et al., 2011; Wilner, 2000; Wilson and Summers, 2002).

These theories are not able to explain how financial markets imperfections, e.g. information asymmetry, can affect the demand for trade credit (see Emery, 1984). Biais

and Gollier (1997) introduce signaling model in which suppliers have monitoring advantages over banks, and hence they could mitigate financial constraints. In this line, Burkart and Ellingsen (2004) and Burkart *et al.* (2006) show that supplier's informational advantage over banks but this advantage is only applicable to input transactions. This view is augmented by Fabbri and Menichini (2010) who argument that suppliers reach monitoring and liquidation advantages providing financing, such that firms could be benefited from liquidity advantages from their suppliers. Aktas *et al.* (2012) also argue that trade credit use provides valuable information to outsiders investors.

Much of the theoretical and empirical literature analyses the functioning of transmission channels of monetary policy separately, but the fact is that shocks in monetary policy, and changes in interest rates, are transmitted through other channels simultaneously (see Clauss, 2011). Economic literature has traditionally focused to study the effects of monetary policy on the bank interest rates and credit availability, even considering the trade credit channel as a substitute of bank lending channel. Then, in this paper we propose that the effects of moving the interest rates of monetary policy are also transmitted to the cost of trade credit finance (see Guariglia and Mateut, 2006; Mateut *et al.*, 2006).

We construct a proxy to measure the implicit interest rate of trade credit (IIR hereafter) by considering financial expenses extracted interest expenses paid for other financial choices for each trade payable. We find that a tightening in monetary policy is translated into a more expensive trade credit financing. In addition, we investigate the effect of a tightening in monetary policy on the firm trade financing behaviour. We also construct a new index to measure the relative weight of trade credit or trade debit in the firm's current assets: the relative net trade credit (RNTC hereafter). To our knowledge

this is the first paper to employ a relative measure of defined within a homogeneous rank. Although economic literature offers other indexes as net trade credit (see Guariglia and Mateut, 2006; Kohler *et al.*, 2000; Petersen and Rajan, 1997;), this proxy are not able to compare firms homogeneously since is based on the simply difference between account payable and account receivable, which means that the results are difficult to compare among firms of different sizes. We contribute to methodology scaling by the total amount of trade financing which help to mitigate the problem of comparability between firms. Focusing on our empirical results, we find that a rising in interest rates conducts to skew the balance on the trade credit side, i.e. firms are more prone to become in trade credit borrowers.

We also extended the literature on trade credit channel by examining the effects of monetary policy on the competition and complementarity effect. Regarding to the first fact, we do find that raising interest rates leads to an increase in the distance between the IIR and the average interest rate for the industrial sector which the firm belongs to. On the other hand, we also do find that the differential between the IIR and the cost of bank financing is closer according as monetary policy is increasing. Those results suggest the existence of complementarity effect between trade credit and the cost of bank financing in an increasing interest rate environment.

The remainder of the paper proceeds as follows. Section 2 presents the background literature. Section 3 formally discusses the theoretical and empirical approach in order to test the hypothesis of this research. Section 4 outlines the data and sample construction. Section 5 presents empirical analysis for the testable hypotheses of this research. Finally, Section 6 contents the main conclusions and policy implications.

2. Background literature

The interest rate channel results from the central bank's response to target objectives, and central bank adjusts the rate of interest rate on domestic bonds. Therefore, those changes in interest rate are transmitted to the real sector, and moreover, interest rate channel has the largest effect in the transmission of shocks to the real economy (see Clauss, 2011).[1]

Market imperfections have a central role in the transmission of monetary policy through the credit channel (see Romer and Romer, 1990, 1994; Hubbard, 1998). When there exists imperfect information, alternative types of credit can not been granted as perfect substitutes and the availability and the price of them depends on factors related to the strength of firm's balance sheets (see Mateut, 2005; Mateut *et al.*, 2006). The *bank lending channel* approach was introduced by Bernanke and Blinder's (1988) theoretical model, and this framework is based on the view that banks play a special role in the financial system because of they have advantage in solve the asymmetric information problem in credit markets (see Bernanke and Blinder, 1992; Bernanke and Gertler, 1995; Kashyap and Stein, 2000). Stein (1998) develops a model in which information problems make difficult for banks to raise funds with instruments other than insured deposit. The main implication of the bank lending channel for firm's credit and investment are those related with an increase in the monetary policy would have a significant impact for firms more dependents on bank credit (see Kashyap and Stein, 2000). In contrast, Kashyap *et al.* (1993) show that tighter monetary policy leads to a shift in firm's mix of external financing: commercial paper rises in detriment of bank loans, and therefore, this fact reduces bank credit availability. Recently, Huang (2003) and Huang *et al.* (2011) show that the dynamic behaviour of bank debt versus non bank

---

[1] The interest rate channel postulates that an expansionary monetary policy leading to a fall in interest rates which in turn lowers the cost of capital, causing a rise in investment expending, thereby leading to an increase in aggregate demand output.

debt shows that the lending channel works through cutting back the loan supplies to small firms which suffer more than large firm because of does not have more alternatives of bank finance, consistent with the inventory behaviour. Carbó and López (2009) analyse the empirical relationship between liquidity and firm financial structure in order to assess the importance of monetary policy on the context of firm financing. Using dynamic panel data techniques for Spanish firms show that when interest rates increase, firms reduce their dependence on bank lending and maintain a higher level of liquidity.[2]

Even through bank lending channel is declining in importance, the Bernanke and Gertler's (1995) *balance sheet channel* gains progressively relevance. The *balance sheet channel* arises from the presence of asymmetric information problems in credit markets. Important theoretical findings (see Bolton and Freixas, 2000; Diamond, 1984, 1991; Hoshi *et al.*, 1990, 1991; Repullo and Suarez, 2000) demonstrate that capital market imperfection conditions the access for firms in weak financial position. Those models predict that in period of monetary tightening the weak financial firms have more difficult to access to bank credit. Bernanke and Gertler (1989, 1995) expose that a monetary tightening damages the firm's creditworthiness, and then the firm financial position decreases, as a consequence, also diminishes the firm ability to raise funds from banks or other financial intermediaries, e.g. disables the bank lending channel.[3] The empirical works of Gelter and Gilchrist (1993, 1994) show that the sharpest distinction arises between small and large borrowers as opposed between bank and

---

[2] Benito (2005), in a similar approach, both a market-based system (United Kingdom) and a bank-based system (Spain), for the sensitivity of inventories to financial pressure and liquidity effects, finds support for the Bank Dependence Hypothesis for bank lending channel.

[3] The balance sheet channel is closely related to the idea of "financial accelerator". That theory builds from the premise that changes in interest rates from the central bank affect the value of firm's assets and the cash flow of potential borrowers, and then, its creditworthiness. According to this view, a tightening in monetary policy reduce the net worth and liquidity of borrowers, and increase the effective cost of credit by more that the change in risk-free rates, and therefore, might intensify the effects of monetary policy (see Bernanke *et al.*, 1996).

non-bank credit. Following tight money, lending to small firms declines relative to lending to large firms.[4] Ashcraft (2006) and Ashcraft *et al.* (2007) investigate whether borrowers' creditworthiness influences the response of bank lending to monetary policy. Those results are consistent with a demand-driven transmission mechanism that works through firms' balance sheet and is independent from the bank lending channel. Bougheas *et al.* (2006, 2009) empirically find that small, young, and risky firms are more significantly affected by tight monetary conditions. Nevertheless, the most recent strand of the economic literature shows that bank lending channel also operates via bank risk. In recent years, before the 2008 financial crisis credit standards applied to bank loans have been gradually relaxed. This lower pressure on banks' balance sheet was reflected in a in a decrease in the expected default rates. Altunbas *et al.* (2012) show that institutions with higher risk exposure had less capital, larger size, greater reliance on short-term market funding, and aggressive credit growth. In this line, Altunbas *et al.* (2010) show that bank risk plays an important role in determining banks' loan supply and in sheltering them from a tightening of monetary policy. Low-risk banks can better shield their lending from monetary tightening as they have better and easier access to fund raising. This result is consistent with the bank lending channel view. The greater exposure of high-risk bank loan portfolio to monetary policy shock is diminished in the expansionary phase, consistently with the hypothesis of a reduction in market perceptions in good times. In particular, securitization used before the financial crisis has contributed broadly to modify the bank lending channel as well as banks' ability to grant credit as argued by Altunbas *et al.* (2009). The authors show that the use of securitization activity also reduces the effectiveness of monetary policy. Moreover,

---

[4] See also Black and Rosen (2007) who show that during periods of tight monetary policy, banks adjust their stocks of credit reducing the maturity of loans and reallocating their short-term loan supply for small firms to large firms.

banks making a massive use of securitization tend to grant a higher amount of loans and this effect is stronger when the economy is in good shape.

A topic related to credit channel view is the *broad credit channel* approach. Oliner and Rudebusch (1995, 1996b) relates that at the heart of the broad credit channel is the proposition that internal and external funds are not perfect substitutes because of informational asymmetries which are more severe for small than for large firms. Oliner and Rudebusch (1996a) show that the broad credit channel operates through small firms. The broad credit channel stresses that all forms of external finance are imperfect substitutes for internal funds. Therefore, those asymmetries of information induce to a cost premium for external funds as a compensation for the expected cost for monitoring cost, and this premium depends on the stance of monetary policy which can deteriorate the borrower's balance sheet and reducing the collateral.

Morevover, *trade credit channel* might be a substitute for the *bank lending channel*. The trade credit channel is a theoretical point of view of the implications of the trade credit for the broad credit channel approach. Recently, Nilsen (2002) shows that during tight monetary policy small firm and those large firms without sufficient collateralized assets increase the use of trade credit. A similar result provides from Guariglia and Mateut (2006) and Mateut *et al.* (2006) whom find that during monetary contractions firms increase trade credit suggesting that both the credit and the trade credit channels operate in UK, and the latter channels tend to weaken the former,[5] whereas Choi and Kim (2005) show that both account payables and account receivables are increased in tighter monetary policy. Atanasova and Wilson (2003, 2004) find that

---

[5] A similar result is obtained by Kohler *et al.* (2000) focused on the net trade credit.

during monetary contraction corporate demand for bank credit decreases, whereas the supply of bank loans also decreases.[6]

We are also concerned to study the effects of monetary policy on the behaviour of working capital financing. We find in the economic literature several arguments advocating for the complementarity between the availability of bank lending and trade credit when financing credit constraint is imposed by financial institutions (see Burkart and Ellingsen, 2004; Cull *et al.*, 2009; Danielson and Scott, 2004; Giannetti *et al.*, 2011; Petersen and Rajan, 1994, 1995, 1997), providing evidence for the pecking order debt financing (see Myers, 1984; Myers and Majluf, 1984). Cook (1999) shows that, for non-financial firms support the role of other financial intermediaries to solve problem of informational asymmetries. Ono (2001) argues that small firms whose liquidity is constrained, non transactional factor as an increase in cash flow decrement the need for and also finds that trade payables act as a complement to bank loans, whilst Elliehausen and Wolken (1993) find evidence of the *complementarity hypothesis* consistent with the *credit rationing hypothesis*.[7] Recently, Boissay and Gropp (2007) and Cuñat (2007) find that trade creditors are willing to grant more when customers are rationed in the loan market. Carbó *et al.* (2012) also find support for the complementarity hypothesis because of analysing the supply side of trade credit. They find a significant sensitivity of the extension of trade credit to bank lending at unconstrained firms which suggest the role of lenders due to the easier access to bank lending. Love and Zaidi (2010) do not find support the hypothesis that trade credit could substitute bank credit in times of crisis. Firms constrained in credit finance receive less trade credit in terms of quantity

---

[6] Ramey (1992) extends the theory of King and Plosser (1984) by recognizing that under certain conditions the co-movements between monetary policy and trade credit reveal the existence of underlying financial shock for most of the fluctuations in money at business cycles frequencies.
[7] See also Alphonse *et al.* (2006) whom find that trade credit helps firms to improve their reputation and then this can work as a signal about firm's quality and thus facilitates access to bank debt.

and length of time, but discount terms rise both in payables and receivables.[8] On the other hand, the economic literature also reports that bank loans are a cheaper substitute for trade credit supporting the *substitution hypothesis*. Fukuda *et al.* (2006) has focused on the substitutability of bank loans for trade credit in period of tight money. A similar result is supported by De Blasio (2005). This is an argument supporting the substitution hypothesis under serious financial turbulences.[9] Those results are consistent with those presented by Tsuruta (2007, 2010) who argues that during economic recessions the amount of trade credit is reduced by suppliers, Uesugi and Yamashiro (2008) find that trade credit and bank loans differ substantially in terms of creditors, and among credit instruments.[10] Finally, Huang *et al.* (2011) highlights a counter-cyclical behaviour between trade credit and bank credit, i.e. the authors find evidence of substitution effects of those forms of short-term financing when production efficiency is greater than one, which is common in the real world. On the other hand, the pro-cyclical pattern of substitution behaviour is possible, but infrequent.

3. Methodology

3.1. Theoretical approach

The theoretical framework employed in our research is based on Oliner and Rudebusch (1995) approach. In this model, which is based on the theoretical approach pioneered by Kashyap *et al.* (1993), a firm minimizes the financial cost of its debt based on firm's stock of bank debt, and nonbank debt subject to the above composition of

---

[8] The results of Ono (2001) and Carbó *et al.* (2012) also shed light to understand that trade credit helps to alleviate the problems derived from a tightening in monetary policy.

[9] Fukuda *et al.* (2006) also find that under financial crises both bank lending and trade credit are seriously constrained.

[10] Cull *et al.* (2009) find recent evidence, for the case of China, that more profitable private domestic firms were more likely to extend trade credit than unprofitable ones. Moreover, trade credit likely provided a substitute for loans for these firms' customers that were shut out of formal credit markets.

debt. The main difference of our model related to other ones is that we consider explicitly the whole sources of funds presents on firm's liabilities.[11]

Thus, following Oliner and Rudebusch (1995) we consider first the direct interest payment on firm's bank debt (B), and then, we introduce into the model the firm's trade credit (TC), and the firm's shareholders funds (S), which equals $r_B B + r_{TC} TC + r_S S$, where r_B, r_{TC}, and r_S are the interest rates paid by the firm ($r = r_B + r_{TC} + r_S$). The second component, which partly offsets these interest costs, are the relationship benefits (R) that the firm derives from the bank borrowing proposed by Kashyap *et al.* (1993) and given by:

$$R = f\,(B/D)D \tag{1}$$

where D represents the total liabilities ($D = B + TC + S$), and $f\,(B/D)$ is an increasing concave function ($f' < 0$, and $f'' > 0$) which means that for a given amount of total debt, the relationship benefit rises with the bank loan share, subject to diminishing returns. To model the effects of the long-term debt, we add the adjustment cost for debt stocks and the model assumes that the cost are greater for the long-term debt that the short-term debt.[12] With this setup, the adjustment cost for $L = B$, TC, and S will differ to the extent that they have unequal average maturities. Then, adjustment cost might be specified as:

$$A_L = \left(\varphi/2\delta_L\right)\left[(L - L_0)/L_0\right]_{L_0}^2 \tag{2}$$

Where B_0, TC_0, and S_0 are the initial cost of bank debt, trade credit, and shareholders funds, respectively; whereas B, TC, and S the final stock of themselves.

The firm attempts to minimize its financial cost considering the adjustment cost exposed above. The firm financing is constrained by a given amount of liabilities and a total amount of interest rates that the firm is willing to pay for the above debt.

---

[11] We do not consider the commercial paper in our model because of European financial system is bank-based whilst the Anglo-Saxon one is market-based.

[12] More recently a similar approach has been carried out by Huang (2003). The main differences are the inclusion of adjustment cost, and we consider in our model the whole liabilities.

Therefore, we propose the following model in which the firm choices to minimize its financial cost:

$$\min C = r_B B + r_{TC} TC + r_S S + \left(\varphi/2\delta_B\right)\left[(B-B_0)/B_0\right]^2_{B_0} + \left(\varphi/2\delta_{TC}\right)\left[(TC-TC_0)/TC_0\right]^2_{TC_0}$$
$$+ \left(\varphi/2\delta_S\right)\left[(S-S_0)/S_0\right]^2_{S_0} - f(B/D)D$$

s.t. $D = B + TC + S$ $\qquad\qquad\qquad\qquad\qquad\qquad\qquad$ (3)
$\qquad r = r_B + r_{TC} + r_S$

Solving the minimizing program (3), we obtain the structural model that relates trade credit cost (r_{TC}) and the factors that influence the choice of trade credit level.

$$r_{TC} = f'(B/D) - r_B - r_S -$$
$$-\varphi\left[(1/\delta_B)\left[(B-B_0)/B_0\right]_{B_0} + (1/\delta_{TC})\left[(TC-TC_0)/TC_0\right]_{TC_0} + (1/\delta_S)\left[(S-S_0)/S_0\right]_{S_0}\right] \quad (4)$$

Differentiating (4) w.r.t. the monetary policy stance implies:

$$dr_{TC}/dMP = f''(B/D)\left[d(B/D)/dMP\right] - dr_B/dMP - dr_S/dMP -$$
$$-\varphi\left[(1/\delta_B)\left[(dB/dMP)/dB_0\right]_{B_0} + (1/\delta_{TC})\left[(dTC/dMP)/dTC_0\right]_{TC_0} + (1/\delta_S)\left[(dS/dMP)/dS_0\right]_{S_0}\right]$$

$$(5)$$

Equation (5) characterizes the response of the cost of firm's trade credit to a monetary contraction in the presence of adjustment cost. In general, the movements of the cost of firm's trade credit is not only on the change of purely monetary variable, but also in the form that monetary policy affects the other sources of funds content in its liabilities, and therefore, the payment that the firm is committed to serve.

Once we have revised the existing economic literature on monetary policy and the different channels of transmission to firms' activity, and considering the theoretical framework presented above, we can formulate the following four testable hypotheses:

Hypothesis 1: *We expect a positive relationship between a variation in monetary policy interest rate and the implicit interest rate of trade credit. Therefore, a tight in monetary policy induces to firms to increase the price of trade financing.*

Hypothesis 2: *We expect a positive effect of a variation in monetary policy interest rates and the relative net trade credit index. Therefore, a tight in monetary policy induces firms to maintain a larger proportion of trade credit rather than trade debit in their balance sheet.*

Hypothesis 3: *We expect positive effect of a tight of monetary policy and the differential between the implicit interest rate paid by the firm and the average rate of the industrial sector which firm belongs to. Therefore, we expect divergence among competitors in a rising interest rate environment.*

Hypothesis 4: *We expect negative effect of a tight of monetary policy and the differential between the implicit interest rate of trade credit and the cost of bank financing. Therefore, we expect the existence of complementarity effect between both forms of firm financing in a rising interest rate environment.*

3. 2. Implicit interest rate of trade credit and variables approximation

In the theoretical specification presented above, we have proposed empirically that a variation in interest rates due to changes in monetary policy has direct repercussions on the IIR of trade credit. Therefore, based on the theoretical discussion and the result obtained from the equation (5), we propose the following specification which relates the stance of monetary policy variables (ΔM_t) as well as the main firm's financial variables with the variation of the IIR:

$$\Delta r_{it}^{TC} = \alpha_0 + \alpha_1 \Delta r_{it}^{B} + \alpha_2 \Delta r_{it}^{S} + \alpha_3 \Delta B_{it} + \alpha_4 \Delta TC_{it} + \alpha_5 \Delta CAP_{it} + \alpha_6 \Delta MP_t + \alpha_7 \Delta LTA_{it} + \alpha_8 \Delta CFA_{it}$$

$$\alpha_9 Crisis_t + \sum_{k=1}^{K} \gamma_k IND_{kit} + \sum_{h=1}^{H} \delta_h REG_{hit} + \xi_{it}$$

$$(6)$$

where the subscripts $i = 1...N$, refers to the firm, $k = 1...K$, refers to the industry sector in which the firm operates, and finally, $h = 1... H$ refers to regional dummy where the firm operates.

The dependent variable is the variation in first differences of the IIR of trade credit (Δr_{it}^{TC}) proxy as the ratio between *financial expenses* minus *interest paid* over *current assets: creditors*. The extension of trade credit leads to an opportunity cost for lending firms which is then translated to financial cost for borrowing firms. Several papers that consider the IIR employ cross-section survey data in which discount percentage, and discount and net period are asked to entrepreneur (see Ng *et al.*, 1999; Wilson and Summers, 2002; Mateut, 2005).[13] Since we are concerned to study the effect of monetary policy interest rates on IIR, we need to collect a broad number of periods for several firms and obtain survey for ten years data would be an almost impracticable exercise.

Bank lending channel is related throughout the interest paid for the bank loans (Δr_{it}^{B}) measured as *interest paid* over *total assets* in first differences. Subsequently, we define the payments than firm might serve for shareholders funding (Δr_{it}^{S}) is measured as financial expenses over total assets in first differences and represents the proportion of dividends that firm might pay to its shareholders.

---

[13] Several papers consider computing the implicit interest rate of trade credit the percentage discounted as well as the discount and net period of trade credit granted as:

$$I.I.R. = \left\{ \left(\frac{100}{100 - discount\%} \right)^{360 / (creditperiod - daysdiscount)} - 1 \right\}$$

The variation in the amount of bank debt (ΔB_{it}) is the leverage ratio measured as *long-term debt* over *total assets*. The amount of bank debt is an important variable in the bank lending channel due to banks reduce the supply of loans, and firms reduce the demand of loans after a monetary shock (see Kashyap *et al.*, 1993). Shareholder financing (ΔCAP_{it}) is the capitalization ratio measured as the ratio among shareholder funds to total assets in first differences. Trade credit is represented by ΔTC_{it} and constitutes the first differenced variable of the amount of trade credit for the current period and the lagged one period respectively. The amount of trade credit is measured as the ratio among *accounting payable* over *total debt*. Asymmetric information is present in the relationship between bank and firm. Therefore, we take into account the variable ΔLTA_{it} given by the logarithm of firm's total assets which will proxy the availability of information about the firm. Since firm financing constraint constitutes an important determinant to substitute financial markets for seller financial markets, we include the ratio cash flow over firm's total assets in first differences (ΔCFA_{it}).

Variation in interest rates of monetary policy is the key exogenous variable employed in our paper (ΔMP_t). Recent economic literature relies on the three-month interbank interest rate as indicator on monetary policy (see Carbó and Rafael López, 2009; Kashyap and Stein, 2000; Kishan and Opiela, 2000, 2006, 2012). Therefore, we use the three-month $EURIBOR_t$, and lending facilities (LF_t) as main measures of stance of monetary policy.[14] We also employ the bank interest rate measured as the average price in first differences (ΔP_{jit}) that banks establish for their loans measured as *interest income* plus *other operating income* over *bank's total assets* from AEB-CECA-UNACC (2010) database (see Maudos and Fernández de Guevara, 2004, 2007; Fernández de

---

[14] The three-month interbank interest rate (EURIBOR) is a common interest rate in the Euro zone established in an auction conducted by the major European banks within the European Central Bank.

Guevara *et al.*, 2007). As robustness check, we introduce in our estimates the *EONIA_t* since it follows a similar pattern with respect to *EURIBOR_t* and constitutes the shorter form of bank financing in the ECB.

The most recent economic literature shows that the pattern of trade credit has been altered after processes of financial crisis by decreasing of the volume of trade credit and an increasing of IIR (see Love and Zaidi, 2010). Therefore, we include a time-dummy crisis variable (*crisis_it*) that takes on the value if period ranges from 2007 to 2009, and zero otherwise. Finally, we include industry dummy variable (*IND_kit*) to control for the industry effects of firm's parameters and regional dummy variables (*REG_hit*) to control for the geographic influence on firm performance.

3. 3. Formulation of the relative net trade credit

The second part of our paper analyzes the role of monetary policy on trade financing position. We develop the relative net trade credit (*RNTC_it*) beginning on the difference among account payables (*Cr_it*) and account receivables (*Db_it*) in numerator over the overall amount of trade credit accumulated both in current assets and current liabilities. Then, both levels of the fraction are divided by firm's total assets (*TA_it*). Finally, we obtain in numerator the ratio net trade credit (*NTC_it = TC_it - TD_it*) over the sum trade credit (*TC_it*) plus trade debit (*TD_it*) that represents the total firm's trade credit. To our knowledge, this is the first paper in which this ratio is employed.

$$RNTC_{it} = \frac{Cr_{it} - Db_{it}}{Cr_{it} + Db_{it}} = \frac{\left(\frac{Cr_{it}}{TA_{it}} - \frac{Db_{it}}{TA_{it}}\right)}{\left(\frac{Cr_{it}}{TA_{it}} + \frac{Db_{it}}{TA_{it}}\right)} = \frac{TC_{it} - TD_{it}}{TC_{it} + TD_{it}} = \frac{NTC_{it}}{TC_{it} + TD_{it}} \tag{7}$$

The economic interpretation of this ratio is that if net trade credit is negative (positive), the firm is net credit extender (receiver). The financial interest of RNTC is on

the normalization of trade credit, since he ratio ranges, theoretically rather than empirically, from -1 meaning that firm has only trade debit in its balance sheet, to 1 by considering that firm has only trade credit in its balance sheet. Then, the empirical specification for explaining the effect of monetary policy on firm financial position could be expressed as:

$$RNTC_{it} = \alpha_0 + \alpha_1 \Delta r_{it}^B + \alpha_2 \Delta r_{it}^S + \alpha_3 \Delta B_{it} + \alpha_4 \Delta TC_{it} + \alpha_5 \Delta CAP_{it} + \alpha_6 \Delta MP_t + \alpha_7 \Delta LTA_{it} + \alpha_8 \Delta CFA_{it}$$
$$\alpha_9 Crisis_t + \sum_{k=1}^{K} \gamma_k IND_{kit} + \sum_{h=1}^{H} \delta_h REG_{hit} + \xi_{it}$$

(8)

3. 4. Modelizing competition and complementarity effect

We are concerned to study the competition effects among firms in order to establish the price of trade credit. To test the hypothesis 3, we introduce as dependent variables the difference between the IIR paid by the firm and the average IIR for each industrial sector ($\overline{r_{kt}^{TC}}$) because of the conditions of trade credit are different depending on it.

$$r_{it}^{TC} - \overline{r_{kt}^{TC}} = \beta_0 + \beta_1 \Delta r_{it}^B + \beta_2 \Delta r_{it}^S + \beta_3 \Delta B_{it} + \beta_4 \Delta TC_{it} + \beta_5 \Delta CAP_{it} + \beta_6 \Delta MP_t + \beta_7 \Delta LTA_{it} + \beta_8 \Delta CFA_{it}$$
$$\beta_9 Crisis_t + \sum_{k=1}^{K} \gamma_k IND_{kit} + \sum_{h=1}^{H} \delta_h REG_{hit} + \xi_{it}$$

(9)

Moreover, we extend our analysis to study of complementarity between trade credit and bank financing to test the hypothesis 4. Thus, we include as a dependent variable the difference between the IIR and the cost of bank financing:[15]

$$r_{it}^{TC} - r_{it}^B = \varphi_0 + \varphi_1 \Delta r_{it}^S + \varphi_2 \Delta B_{it} + \varphi_3 \Delta TC_{it} + \varphi_4 \Delta CAP_{it} + \varphi_5 \Delta MP_t + \varphi_6 \Delta LTA_{it} + \varphi_7 \Delta CFA_{it}$$
$$\varphi_8 Crisis_t + \sum_{k=1}^{K} \gamma_k IND_{kit} + \sum_{h=1}^{H} \delta_h REG_{hit} + \xi_{it}$$

(10)

---

[15] The reader could note that we have excluded Δr_{it}^B to the specification to avoid problems of endogeneity.

4. Data, database construction, and summary statistics

The data set contains firm level information from *Bureau van Dijk's* SABI (2010) database. Our sample consist in a broad panel data of 13,634 Spanish firms between the period 1998-2009, which results a panel dataset of 145,514 observations. We also consider firms with at less than 250 employees as small and medium enterprises (SME), and those with more than 250 employees as large firms.

The second set of variables is those related to bank measures. To this proposition we create a panel dataset based on credit institutions' balance sheet and income statement obtained directly from the Spanish Banking Association (AEB) for commercial banks data, Spanish Savings Banks Association (CECA) for savings banks data, and National Union of Credit Cooperatives (UNACC) for credit cooperatives data.[16] Once we have obtained both firms and banks panel data, we are able to merge the two databases. SABI database contains as a variable the main bank which the firms operate with. This variable is very useful in our research because of it permits to merge the firm and bank databases, and therefore we could establish the subsequent relationship between the parameters of each bank with the correspondent firm for each period. To our knowledge, this is the best way to research the transmission of monetary policy via bank lending channel, as well as other industrial characteristics as bank market power, bank efficiency, etc.

The third set of variables is those directly related with the stance of monetary policy i.e. EURIBOR, EONIA and LF obtained from the Bank of Spain database. We have merged the macroeconomic variables into the final database directly throughout the period variable.

---

[16] The acronyms correspond with the Spanish denominations: *Asociación Española de Banca* (AEB), *Confederación Española de Cajas de Ahorros* (CECA), and *Unión Nacional de Cooperativas de Crédito* (UNACC).

Table 1 contains the definitions and explanatory comments on the main variables employed in this paper. Table 2 reports summary statistics of the variables employed in our research. The results reveal that the IIR is increasing on average (0.001), whilst the RNTC is negative (-0.25) indicating that the firms included in our sample tends to be credit receivers in overall. We are also concerned to clarify the effects of 2007 financial crisis on our variables.[17]

5. Results

5. 1. The effect of monetary policy on implicit interest rate and relative net trade credit

Table 3a presents the econometric regression obtained from expression (6) by using random effects regression for the whole sample of firms to test our first hypothesis. Our results suggest that a tightening of monetary policy induce to an increase on the price of trade credit (0.001) when we consider the whole sample confirming our first hypothesis, but contrary to our expectations our estimations shows a negative impact (-0.002) when we consider ΔLF_t as monetary variable. To deep in our results we divide our sample by firm size, taking as criterion the number of employees as it is shown in table 3b. The results confirm those obtained above using the whole sample, and also permits us conclude that the effect of a shock in monetary policy is higher for large firms than for smaller ones. We also do find that the negative effect of ΔLF_t shown in table 3a is due to the effect of this variable on the price of trade credit for SME. The rest of the coefficients for our control variables show the expected sign and level of significance. In this line, we obtain a negative and significant coefficient for ΔTC_{it} (-0.05) because of the dependent variable is the variation of the price for trade

---

[17] Since our balance sheet data corresponds to December 31, we should take as a reference year of stating of the financial crisis the year 2007, because of the financial magnitudes are fully affected at this date.

credit. We also observe that an increase in the amount of bank debt in the firm's balance (ΔB_{it}) sheet leads to an increase on the price paid for trade credit (0.02) consistent with the complemetarity hypothesis since a highly leveraged firm means higher risk, and trade lenders seek to compensate in order to increase the financing price. We also observe that the existence of financial crisis suppose an increase on IIR consistent with those results shown in Love and Zaidi (2010).

The empirical results for the effect of monetary policy on the $RNTC_{it}$ are reported in tables 4a and 4b. Regressions presented in table 4a show that a tightening in monetary policy leads to firms to become in net trade borrowers (0.02). The explanation of this effect is related to the one explained above. Our results demonstrate that during rising of macroeconomic -or bank- interest rates financial motives of trade credit provision are present rather than those related with transaction motives (see Atanasova, 2007; Atanasova and Wilson, 2003, 2004; Carbó *et al.*, 2012, among others). Table 4b separates the sample by firm size. We do find that the impact of monetary policy is higher for larger firms since they could borrow more financing than SMEs. We are also concerned to the effects of financial crisis on firms' trade credit position. The results show that financial crisis has inverted the process because of the cut of bank credit leads to firms to borrow trade credit –turning around in trade borrowers-. Moreover, the effect of financial crisis is higher for SMEs because of they count with a higher dependence of trade credit whilst they were more affected to financial constraint derived to lending restrictions derived of this event (see Carbó and López, 2009; Huang *et al.*, 2011; Kashyap and Stein, 2000).

5. 2. Competition and complementarity effect

In this section, we analyze the effects of monetary policy on competition of trade lenders and complementarity effect between trade credit and bank lending. The empirical results of competition effects shown in specification (9) are reported in tables 5a and 5b. In table 5a, we do find that rising macroeconomic –or bank- interest rates also lead to augment the distance among the IIR paid by the firm and the average IIR for each industry. In other words, our results suggest that a tightening in monetary policy increase the distance with respect to the price of trade credit of firm's competitors. Table 5b divides the sample by firm size showing that the distance between firms and competitors are larger for SME. This result could be explained because of SME are more dependent on trade credit than large firms, and then, variations on financing rates distance more smaller firms from the rest of sector. We also do find that financial crisis close the firm competition position to the price of the industrial sector which firm belongs to. The analysis of control variables shows the expected signs and results.

Once we have analyzed the effects on competition position related to industrial sector, we are also interested in analyzing the effects on complementarity effects shown in specification (10) is reported in tables 6a and 6b. The results obtained from the whole sample reveal that increases in interest rates lead to close the price of trade credit and bank financing, indicating the existence of complementarity between both forms of firm financing. Table 6b shows that the effect is higher in absolute value for larger firms than SME. The reason is that they could impose higher prices for trade credit whilst they could pay less for bank credit.

5. 3. Robustness check: the effect of EONIA

We subject our estimates to a robustness checks in order to address the potential concerns about the specification and the election of monetary policy variables. In table 8 we include the variation of EONIA ($\Delta EONIA_t$) in different specifications replacing the former monetary policy variables. The reason of including EONIA as robustness check is that it corresponds to the rate at which a prime bank is willing to lend to another one. At difference with EURIBOR, which is calculated in base of 3 or 12 month, the EONIA is overnight but the pattern is very close to the rest of ECB's interest rates. The results maintain the expected sign and magnitudes for the whole regressions, indicating that our estimates are robust and consistent for each specification shown above.

6. Conclusions

In this paper, we have employed a panel with 13,634 firms over the period 1998-2009 to test the effects of monetary policy on the price of trade credit, the balance sheet effect, and the effect within industrial sectors. We have conducted two useful measures to proxy the price for trade credit called IIR, and the relative position for trade finance within a closed range and hence, making measurement comparable between firms of different size called RNTC. Our main finding confirms that a tightening in monetary policy (*via interest rate channel*) is transmitted to an increase of cost for trade credit paid by firms. As robustness check, we have also employed the average bank price for credit (*via credit channel*) on the cost of trade credit and we obtain similar results. In the light of our results, we can conclude that as well the decisions of increase the reference interest rates of monetary policy are transmitted to an increase in the cost of bank financing; it is also transmitted to an augment in the cost of trade credit. To our

knowledge, this is the first paper that analyzes the effect of monetary policy on the cost of trade credit.

Monetary policy also has an important effect on the RNTC. We also find that a tightening of monetary policy leads to firm to become in net trade borrowers. Our results demonstrate that during rising of macroeconomic -or bank- interest rates financial motives of trade credit provision are present rather than those related with transaction motives (see Atanasova and Wilson, 2003, 2004, 2007; Carbó *et al.*, 2012), among others). Additionally, we have also divided the sample considering firm size. We find that that the impact of monetary policy is higher for larger firms since they could borrow more financing than SMEs. We are also concerned to the effects of financial crisis on firms' trade credit position. The results show that financial crisis has inverted the process because of the cut of bank credit leads to firms to borrow trade credit – turning around in trade borrowers-. Moreover, the effect of financial crisis is higher for SMEs since they count with a higher dependence of trade credit whilst they were more affected to financial constraint derived to lending restrictions derived of this event (see Carbó and López, 2009; Huang *et al.*, 2011; Kashyap and Stein, 2000).

We extend our analysis to the position of IIR among competitors in two ways: competition and substitution effect. We construct a new indicator based on the difference between the interest rate imposed by the firm and the average IIR of each industrial sector. We segregate our analysis by sectors because of each sector counts with different patters of granting trade credit. We find that a tight in monetary policy leads to create divergence among the diverse IIR paid by firms in the same sector. This effect might be the results of the increasing cost of trade credit. On the other hand, we are interested to study the substitutability between trade credit and bank financing. Hence, we construct the indicator as the difference between the cost of trade credit, i.e.

IIR, and the price paid by bank financing. We also find that a tightening in monetary policy reduces the distance between the prices of both form of financing. This result is also important for economic literature because of supports the *complementarity hypothesis* in a tightening monetary policy environment.

This paper support important policy implications for entrepreneurs and policy makers. In this line, entrepreneurs could note whether the interest rate are increasing, then price of trade credit will also rise. Then, they also advice that firms will be more willing to borrow trade credit, since bank financing are more expensive.

Table 1:
Definition of variables

Dependent variables	
Δr_{it}^{TC}	This variable represents the variation of implicit interest rate (IIR) or trade credit measures the price that firms paid for trade finance. The variable is proxy as the ratio *financial expenses* minus *interest paid* over *current assets: creditors*
$RNTC_{it}$	Net trade credit measures the net trade financing position and its relationship with firm's market power. We develop the relative net trade credit beginning on the difference among credit and collection period over the total credit period in denominator.
$r_{it}^{TC} - \overline{r_{kt}^{TC}}$	This variable measures the competition effect and is proxy for the difference between the implicit interest rate of trade credit paid by firm i and the average interest trade credit for each period t and industrial sector k which firm belongs to.
$r_{it}^{TC} - r_{it}^{B}$	This variable measures the complementarity effect and is proxy as the difference between the implicit interest rate of trade credit and the price paid by firm for bank financing.
Explicative variables	
ΔTC_{it}	This variable is the variation in trade credit and constitutes the first differenced variable of the amount of trade credit for the current period and the lagged one period respectively. The amount of trade credit is measured as the ratio among *accounting payable* over *total debt*.
ΔB_{it}	This variable represents the variation in the amount of bank debt is the leverage ratio measured as *long-term debt* over *total assets*. The amount of bank debt is an important variable in the bank lending channel due to banks reduce the supply of loans, and firms reduce the demand of loans after a monetary shock (see Kashyap *et al.*, 1993).
ΔCAP_{it}	This variable represents the variation in the amount of shareholder financing is the capitalization ratio measured as the ratio among shareholder funds to total assets.
ΔMP_{t}	This variable measures the variation in the stance of monetary policy. We use the three-month *EURIBOR$_t$*, *EONIA$_t$*, or *LF$_t$* as main measures of stance of monetary policy (see Carbó and López, 2009; Kashyap and Stein 2000; Kishan and Opiela, 2000, 2012).
ΔP_{jit}	This variable represents the variation in bank interest rate measured as the price that banks establish for their loans measured as *interest income* plus *other operating income* over *bank's total assets* from AEB-CECA-UNAC (2010) database (see Maudos and Fernández de Guevara, 2004, 2007; Fernández de Guevara *et al.*, 2007).
Δr_{it}^{S}	This variable defines the variation of payments that firm might serve for shareholders funding is measured as *financial expenses* minus *interest paid* over *firm's total assets* and represents the proportion of dividends that firm might pay to its shareholders.
Δr_{it}^{B}	This variable relates the bank lending channel and the firm's trade credit is the interest paid for the bank loans measured as *interest paid* over *firm's total assets*. The meaning of this variable is the proportion of bank interest that the firm might pay recognized in the firm's balance sheet.
ΔCFA_{it}	This variable measures the variation in the ratio *cash flow* over *firm's total assets* (see Atanasova, 2007).
ΔLTA_{it}	This variable represents the variation in the firm's size measures as the logarithm of *firm's total assets*.

Table 2: Summary Statistics, 1998-2009

	Observations	Mean	S.D.	Minimum	Maximum
Dependent variables					
Δr_{it}^{TC}	75,271	0.0012177	0.0843032	-0.4900578	1.300515
$RNTC_{it}$	92,469	-0.2544931	0.3894728	-0.9817996	0.8421053
$r_{it}^{TC} - \overline{r_{kt}^{TC}}$	88,488	-0.007254	0.0219547	-0.0450484	0.0587834
$r_{it}^{TC} - r_{it}^{B}$	88,942	-0.0043037	0.0260949	-0.0360914	0.0823799
Explicative Variables					
ΔTC_{it}	78,229	-0.015105	0.0938092	-1.322539	1.564509
ΔB_{it}	63,790	-0.0017979	0.0844362	-1.179066	2.375462
ΔCAP_{it}	104,149	0.0061473	0.1019485	-1.045359	1.045359
$\Delta EURIBOR_{t}$	133,043	-0.2452279	1.24778	-2.58	1.49
$\Delta EONIA_{t}$	133,043	-0.2708457	1.124087	-2.14	1.79
ΔLF_{t}	122,053	-0.2454794	1.130524	-2.00	1.75
ΔP_{jit}	130,568	-0.1556383	0.9004671	-13.5709	6.355763
Δr_{it}^{S}	99,033	-0.0039057	0.4831038	-121.4426	15.29185
Δr_{it}^{B}	97,867	-0.0002422	0.0180472	-2.827451	0.6871024
ΔCFA_{it}	116,495	0.0326723	0.1004546	-.3124001	0.3711599
ΔLTA_{it}	104,149	0.1190539	0.4395472	-6.26518	13.40502
Sector dummies					
Agriculture	145,514	0.0132771	0.1144591	0.00	1.00
Mining	145,514	0.0100746	0.0998659	0.00	1.00
Construction	145,514	0.1325165	0.3390526	0.00	1.00
Manufacturing	145,514	0.3091661	0.4621514	0.00	1.00
Transports	145,514	0.0739173	0.2616371	0.00	1.00
Wholesale	145,514	0.2587792	0.4379656	0.00	1.00
Retail	145,514	0.0463254	0.2101897	0.00	1.00
Services	145,514	0.1293759	0.3356166	0.00	1.00
Others	145,514	0.0144179	0.119206	0.00	1.00

Table 3a:
The effects of monetary policy on implicit interest rate, 1998-2009

Dependent variable: Variation on implicit interest rate of trade credit (Δr_{it}^{TC})

z-statistics in parenthesis. Panel data random effect regression.
The whole regressions include industry and country dummies.

Variable	(1)	(2)	(3)
Intercept	0.0126*	0.00515	0.00576
	(2.28)	(1.34)	(1.51)
Δr_{it}^{B}	0.0430*	0.0592**	0.0103
	(1.99)	(2.75)	(0.47)
Δr_{it}^{S}	0.0337***	0.0337***	0.0335***
	(32.45)	(32.38)	(32.23)
ΔB_{it}	0.0108*	0.0129**	0.0102*
	(2.53)	(3.02)	(2.38)
ΔTC_{it}	-0.0526***	-0.0489***	-0.0476***
	(-13.38)	(-12.36)	(-12.02)
ΔCAP_{it}	-0.0218***	-0.0223***	-0.0222***
	(-4.38)	(-4.46)	(-4.41)
$\Delta EURIBOR_{t}$	0.00111***		
	(4.04)		
ΔLF_{t}		-0.00151***	
		(-4.29)	
ΔP_{jit}			0.00450***
			(12.69)
ΔLTA_{it}	-0.0121***	-0.0105***	-0.0137***
	(-7.13)	(-6.22)	(-8.01)
ΔCFA_{it}	0.0325***	0.0362***	0.0334***
	(6.14)	(6.83)	(6.27)
Crisis$_t$	0.00336***	0.00121	0.000154
	(4.59)	(1.62)	(0.21)
Obs	60,448	60,290	59,088
Wald's test	1,445.60***	1,442.41***	1,577.03***
ρ	0.09564022	0.09822544	0.09478211

Notes: *, **, *** statistically significant at the 10, 5 and 1% level, respectively.

Table 3b: The effects of monetary policy on implicit interest rate depending on firm size, 1998-2009

Dependent variable: Variation on implicit interest rate of trade credit (Δr_{it}^{TC})

z-statistics in parenthesis. Panel data random effect regression.
The whole regressions include industry and country dummies.

Variable	Large firms			Medium and Small firms		
	(1)	(2)	(3)	(4)	(5)	(6)
Intercept	-0.182	-0.220	-0.211	0.0141*	0.00628	0.00629
	(-0.45)	(-0.70)	(-0.67)	(2.40)	(1.57)	(1.57)
Δr_{it}^{B}	0.139	0.408	0.121	0.0263	0.0408	-0.000837
	(0.28)	(0.82)	(0.24)	(1.20)	(1.87)	(-0.04)
Δr_{it}^{S}	0.0585***	0.0581***	0.0575***	0.0521***	0.0521***	0.0517***
	(5.15)	(5.09)	(5.01)	(33.61)	(33.59)	(33.38)
ΔB_{it}	-0.129	-0.106	-0.115	0.0116**	0.0135**	0.0114*
	(-1.54)	(-1.26)	(-1.36)	(2.60)	(3.03)	(2.54)
ΔTC_{it}	-0.298***	-0.283***	-0.240**	-0.0465***	-0.0432***	-0.0418***
	(-3.60)	(-3.38)	(-2.86)	(-11.45)	(-10.58)	(-10.24)
ΔCAP_{it}	-0.193*	-0.187*	-0.197*	-0.0125*	-0.0130*	-0.0127*
	(-2.29)	(-2.20)	(-2.29)	(-2.33)	(-2.42)	(-2.35)
$\Delta EURIBOR_{t}$	0.0228***			0.00107***		
	(4.45)			(3.73)		
ΔLF_{t}		0.0131*			-0.00139***	
		(2.03)			(-3.74)	
ΔP_{jit}			0.0256***			0.00397***
			(3.92)			(10.68)
ΔLTA_{it}	-0.129***	-0.116***	-0.126***	-0.0102***	-0.00856***	-0.0115***
	(-4.22)	(-3.79)	(-4.05)	(-5.56)	(-4.70)	(-6.28)
ΔCFA_{it}	-0.329**	-0.322**	-0.323**	0.0346***	0.0383***	0.0357***
	(-3.26)	(-3.18)	(-3.16)	(6.23)	(6.91)	(6.40)
Crisis$_t$	-0.00814	-0.0156	-0.0396**	0.00253***	0.000478	-0.000384
	(-0.58)	(-1.08)	(-2.78)	(3.29)	(0.61)	(-0.51)
Obs	9,302	9,253	9,139	51,146	51,037	49,949
Wald's test	276.81***	259.63***	302.31***	1,427.54***	1,422.78***	1,513.78***
ρ	0.91822582	0.91812491	0.91737108	0.09786529	0.10164345	0.09976008

Notes: *, **, *** statistically significant at the 10, 5 and 1% level, respectively.

Table 4a:

The effects of monetary policy on firm's relative net trade credit, 1998-2009

Dependent variable: Relative Net Trade Credit ($RNTC_{it}$)
z-statistics in parenthesis. Panel data random effect regression.
The whole regressions include industry and country dummies.

Variable	(1)	(2)	(3)
Intercept	-0.150***	-0.154***	-0.195***
	(-3.82)	(-3.93)	(-8.09)
Δr_{it}^{B}	0.238***	0.381***	0.249***
	(4.41)	(7.05)	(4.56)
Δr_{it}^{S}	0.000348	0.000341	-0.000172
	(0.18)	(0.17)	(-0.09)
ΔB_{it}	0.00731	0.0233*	0.0222*
	(0.70)	(2.21)	(2.09)
ΔTC_{it}	0.744***	0.748***	0.787***
	(76.53)	(75.95)	(79.77)
ΔCAP_{it}	0.0235	0.0292*	0.0221
	(1.87)	(2.31)	(1.74)
$\Delta EURIBOR_{t}$	0.0194***		
	(28.63)		
ΔLF_{t}		0.0131***	
		(15.06)	
ΔP_{jit}			0.0177***
			(20.22)
ΔLTA_{it}	0.00957*	0.0212***	0.0172***
	(2.21)	(4.90)	(3.93)
ΔCFA_{it}	0.0266*	0.0436***	0.0520***
	(2.02)	(3.29)	(3.90)
Crisis$_{t}$	-0.0666***	-0.0723***	-0.0922***
	(-35.89)	(-37.96)	(-49.66)
Obs	62,402	62,241	61,007
Wald's test	12,897.96***	12,159.45***	12,190.75***
ρ	0.72181481	0.71976831	0.72184436

Notes: *, **, *** statistically significant at the 10, 5 and 1% level, respectively.

Table 4b: The effects of monetary policy on firm's relative net trade credit depending on firm size, 1998-2009

Dependent variable: Relative Net Trade Credit ($RNTC_{it}$)
z-statistics in parenthesis. Panel data random effect regression.
The whole regressions include industry and country dummies.

Variable	Large firms			Medium and Small firms		
	(1)	(2)	(3)	(4)	(5)	(6)
Intercept	-0.205**	-0.203**	-0.391***	-0.185***	-0.188***	-0.176***
	(-2.73)	(-2.67)	(-6.69)	(-7.28)	(-7.39)	(-6.88)
Δr_{it}^{B}	0.0667	0.321	0.117	0.646***	0.701***	0.303**
	(0.38)	(1.83)	(0.65)	(6.78)	(7.26)	(3.12)
Δr_{it}^{S}	0.0121***	0.0120***	0.0110***	-0.00138	-0.00180	-0.00184
	(3.71)	(3.67)	(3.36)	(-0.44)	(-0.57)	(-0.58)
ΔB_{it}	0.000183	0.0196	0.0219	0.0113	0.0276*	0.0265*
	(0.01)	(0.69)	(0.76)	(1.00)	(2.43)	(2.31)
ΔTC_{it}	0.854***	0.858***	0.911***	0.729***	0.731***	0.771***
	(30.41)	(30.09)	(32.05)	(70.10)	(69.37)	(72.96)
ΔCAP_{it}	0.00662	0.0143	0.00986	0.0280*	0.0309*	0.0224
	(0.23)	(0.50)	(0.34)	(2.00)	(2.19)	(1.58)
$\Delta EURIBOR_{t}$	0.0240***			0.0199***		
	(13.51)			(27.29)		
ΔLF_{t}		0.0192***			0.0141***	
		(8.60)			(14.77)	
ΔP_{jit}			0.0202***			0.0179***
			(8.97)			(18.95)
ΔLTA_{it}	0.00704	0.0193	0.0175	0.00848	0.0188***	0.0122*
	(0.69)	(1.88)	(1.69)	(1.79)	(3.97)	(2.53)
ΔCFA_{it}	0.0146	0.0221	0.0274	0.0243	0.0442**	0.0563***
	(0.43)	(0.64)	(0.78)	(1.70)	(3.08)	(3.90)
Crisis$_{t}$	-0.0283***	-0.0326***	-0.0558***	-0.0722***	-0.0777***	-0.0985***
	(-5.83)	(-6.55)	(-11.48)	(-35.59)	(-37.31)	(-48.64)
Obs	9,665	9,615	9,497	52,805	52,694	51,577
Wald's test	2,196.90***	2,055.41***	2,026.55***	11,079.95***	10,428.34***	10,457.58***
ρ	0.73980361	0.73730219	0.73690266	0.72231349	0.71987634	0.72233141

Notes: *, **, *** statistically significant at the 10, 5 and 1% level, respectively.

Table 5a:
The effects of monetary policy on income effect, 1998-2009

Dependent variable: $r_{it}^{TC} - \overline{r_{kt}^{TC}}$

z-statistics in parenthesis. Panel data random effect regression.
The whole regressions include industry and country dummies.

Variable	(1)	(2)	(3)
Intercept	-0.00586**	-0.00614**	-0.00478***
	(-3.00)	(-3.13)	(-3.82)
Δr_{it}^{B}	0.00387	0.0127*	0.0156**
	(0.78)	(2.56)	(3.08)
Δr_{it}^{S}	0.00196***	0.00197***	0.00190***
	(8.10)	(8.15)	(7.80)
ΔB_{it}	0.00151	0.00229*	0.00351***
	(1.56)	(2.36)	(3.55)
ΔTC_{it}	-0.00174	-0.00304***	0.000828
	(-1.95)	(-3.37)	(0.91)
ΔCAP_{it}	-0.00248*	-0.00193	-0.00243*
	(-2.14)	(-1.66)	(-2.06)
$\Delta EURIBOR_{t}$	0.00178***		
	(28.57)		
ΔLF_{t}		0.00224***	
		(28.11)	
ΔP_{jit}			0.000593***
			(7.29)
ΔLTA_{it}	-0.00235***	-0.00173***	-0.00120**
	(-5.99)	(-4.43)	(-3.02)
ΔCFA_{it}	0.00377**	0.00418***	0.00644***
	(3.11)	(3.45)	(5.23)
Crisis$_{t}$	-0.00306***	-0.00279***	-0.00486***
	(-18.09)	(-16.17)	(-28.64)
Obs	60,493	60,335	59,131
Wald's test	1,925.05***	1,895.70***	1,124.01***
ρ	0.36385083	0.36576975	0.35920875

Notes: *, **, *** statistically significant at the 10, 5 and 1% level, respectively.

Table 5b: The effects of monetary policy on income effect depending on firm size, 1998-2009

Dependent variable: $r_{it}^{TC} - \overline{r_{kt}^{TC}}$

z-statistics in parenthesis. Panel data random effect regression.
The whole regressions include industry and country dummies.

Variable	Large firms			Medium and Small firms		
	(1)	(2)	(3)	(4)	(5)	(6)
Intercept	-0.0149***	-0.0151***	-0.00821*	-0.00389	-0.00416*	-0.00409**
	(-3.36)	(-3.36)	(-2.36)	(-1.90)	(-2.02)	(-3.12)
Δr_{it}^{B}	0.0314	0.0354	0.0451*	0.00131	0.0105*	0.0128*
	(1.72)	(1.95)	(2.43)	(0.26)	(2.05)	(2.45)
Δr_{it}^{S}	0.00155***	0.00156***	0.00152***	0.00300***	0.00303***	0.00296***
	(4.15)	(4.18)	(4.07)	(8.16)	(8.25)	(7.97)
ΔB_{it}	0.00431	0.00462	0.00616*	0.000880	0.00172	0.00286**
	(1.45)	(1.55)	(2.05)	(0.86)	(1.67)	(2.74)
ΔTC_{it}	-0.00131	-0.00242	0.000136	-0.00177	-0.00315***	0.000906
	(-0.45)	(-0.82)	(0.05)	(-1.89)	(-3.33)	(0.95)
ΔCAP_{it}	-0.00318	-0.00295	-0.00296	-0.00180	-0.00119	-0.00176
	(-1.05)	(-0.97)	(-0.97)	(-1.42)	(-0.94)	(-1.36)
$\Delta EURIBOR_{t}$	0.000831***			0.00193***		
	(4.48)			(29.08)		
ΔLF_{t}		0.00123***			0.00242***	
		(5.28)			(28.36)	
ΔP_{jit}			-0.000157			0.000710***
			(-0.66)			(8.20)
ΔLTA_{it}	-0.00420***	-0.00398***	-0.00351***	-0.00189***	-0.00120**	-0.000612
	(-4.07)	(-3.87)	(-3.38)	(-4.39)	(-2.80)	(-1.40)
ΔCFA_{it}	0.00103	0.00105	0.00135	0.00385**	0.00436***	0.00705***
	(0.29)	(0.29)	(0.37)	(2.98)	(3.38)	(5.37)
Crisis$_{t}$	-0.00327***	-0.00304***	-0.00386***	-0.00298***	-0.00269***	-0.00499***
	(-6.53)	(-5.98)	(-7.71)	(-16.49)	(-14.53)	(-27.54)
Obs	9,312	9,263	9,149	51,181	51,072	49,982
Wald's test	193.93***	200.40***	172.15***	1,879.51***	1,835.96***	1,058.23***
ρ	0.33351142	0.33793501	0.33788555	0.36513666	0.36613308	0.35991708

Notes: *, **, *** statistically significant at the 10, 5 and 1% level, respectively.

Table 6a:
The effects of monetary policy on substitution effect, 1998-2009

Dependent variable: $r_{it}^{TC} - r_{it}^{B}$

z-statistics in parenthesis. Panel data random effect regression.
The whole regressions include industry and country dummies.

Variable	(1)	(2)	(3)
Intercept	-0.00316	-0.00281	-0.00406
	(-1.30)	(-1.15)	(-1.65)
Δr_{it}^{S}	0.00242***	0.00242***	0.00242***
	(11.03)	(10.97)	(10.98)
ΔB_{it}	0.00180	0.000654	0.000930
	(1.64)	(0.59)	(0.84)
ΔTC_{it}	-0.00551***	-0.00556***	-0.00891***
	(-5.44)	(-5.43)	(-8.69)
ΔCAP_{it}	-0.00171	-0.00167	-0.00158
	(-1.31)	(-1.27)	(-1.20)
$\Delta EURIBOR_{t}$	-0.00142***		
	(-20.26)		
ΔLF_{t}		-0.00108***	
		(-11.92)	
ΔP_{jit}			-0.00182***
			(-20.16)
ΔLTA_{it}	0.00210***	0.00146***	0.00174***
	(4.76)	(3.31)	(3.90)
ΔCFA_{it}	-0.00171	-0.00300*	-0.00327*
	(-1.25)	(-2.18)	(-2.37)
Crisis$_{t}$	-0.000339	-0.0000128	0.00177***
	(-1.77)	(-0.07)	(9.28)
Obs	60,800	60,641	59,436
Wald's test	877.40***	606.60***	865.11***
ρ	0.42791348	0.4262285	0.42854323

Notes: *, **, *** statistically significant at the 10, 5 and 1% level, respectively.

Table 6b:
The effects of monetary policy on substitution effect depending on firm size, 1998-2009

Dependent variable: $r_{it}^{TC} - r_{it}^{B}$

z-statistics in parenthesis. Panel data random effect regression.
The whole regressions include industry and country dummies.

Variable	Large firms			Medium and Small firms		
	(1)	(2)	(3)	(4)	(5)	(6)
Intercept	-0.00789	-0.00669	-0.00811	-0.00174	-0.00138	-0.00268
	(-1.44)	(-1.22)	(-1.48)	(-0.68)	(-0.54)	(-1.04)
Δr_{it}^{S}	0.00165***	0.00165***	0.00173***	0.00352***	0.00350***	0.00349***
	(4.05)	(4.03)	(4.21)	(11.87)	(11.76)	(11.71)
ΔB_{it}	0.00947**	0.00786*	0.00740*	0.000370	-0.000711	-0.000312
	(2.81)	(2.32)	(2.17)	(0.32)	(-0.61)	(-0.27)
ΔTC_{it}	-0.00800*	-0.00767*	-0.0143***	-0.00520***	-0.00531***	-0.00820***
	(-2.40)	(-2.27)	(-4.22)	(-4.91)	(-4.97)	(-7.65)
ΔCAP_{it}	-0.00188	-0.00174	-0.00177	-0.00140	-0.00146	-0.00127
	(-0.55)	(-0.51)	(-0.51)	(-0.98)	(-1.02)	(-0.88)
$\Delta EURIBOR_{t}$	-0.00262***			-0.00124***		
	(-12.56)			(-16.78)		
ΔLF_{t}		-0.00247***			-0.000866***	
		(-9.31)			(-9.00)	
ΔP_{jit}			-0.00235***			-0.00172***
			(-8.86)			(-18.05)
ΔLTA_{it}	-0.000119	-0.000788	-0.000762	0.00261***	0.00194***	0.00230***
	(-0.10)	(-0.68)	(-0.65)	(5.42)	(4.04)	(4.73)
ΔCFA_{it}	-0.000215	-0.00101	-0.00173	-0.00240	-0.00372*	-0.00379**
	(-0.05)	(-0.25)	(-0.42)	(-1.65)	(-2.55)	(-2.59)
Crisis$_{t}$	-0.000212	0.0000137	0.00302***	-0.000366	-0.0000135	0.00158***
	(-0.37)	(0.02)	(5.27)	(-1.79)	(-0.06)	(7.75)
Obs	9,372	9,322	9,209	51,428	51,319	50,227
Wald's test	319.29***	246.79***	235.76***	685.23***	482.08***	717.89***
ρ	0.40281409	0.39712743	0.39852169	0.43517835	0.43400108	0.43613009

Notes: *, **, *** statistically significant at the 10, 5 and 1% level, respectively.

Table 7:
Robustness test, 1998-2009

z-statistics in parenthesis. Panel data random effect regression.
The whole regressions include industry and country dummies.

Variable	Δr_{it}^{TC}			$RNTC_{it}$		
	Whole sample	Large firms	SME	Whole sample	Large firms	SME
Intercept	0.0126*	-0.182	0.0141*	-0.199***	-0.390***	-0.188***
	(2.27)	(-0.45)	(2.40)	(-8.34)	(-6.69)	(-7.37)
Δr_{it}^{B}	0.0439*	0.205	0.0275	0.286***	0.148	0.642***
	(2.04)	(0.41)	(1.26)	(5.29)	(0.85)	(6.71)
Δr_{it}^{S}	0.0337***	0.0582***	0.0521***	0.000202	0.0118***	-0.00169
	(32.44)	(5.12)	(33.61)	(0.10)	(3.62)	(-0.54)
ΔB_{it}	0.0111**	-0.121	0.0119**	0.0156	0.00870	0.0200
	(2.59)	(-1.45)	(2.68)	(1.48)	(0.31)	(1.76)
ΔTC_{it}	-0.0523***	-0.287***	-0.0462***	0.752***	0.865***	0.737***
	(-13.33)	(-3.47)	(-11.40)	(77.17)	(30.77)	(70.63)
ΔCAP_{it}	-0.0216***	-0.188*	-0.0124*	0.0266*	0.0116	0.0303*
	(-4.34)	(-2.22)	(-2.31)	(2.11)	(0.41)	(2.15)
$\Delta EONIA_{t}$	0.00135***	0.0251***	0.00125***	0.0193***	0.0252***	0.0201***
	(3.90)	(3.94)	(3.43)	(22.65)	(11.46)	(21.68)
ΔLTA_{it}	-0.0120***	-0.125***	-0.00996***	0.0150***	0.0117	0.0134**
	(-7.06)	(-4.09)	(-5.47)	(3.47)	(1.14)	(2.84)
ΔCFA_{it}	0.0328***	-0.326**	0.0349***	0.0359**	0.0182	0.0353*
	(6.20)	(-3.24)	(6.31)	(2.72)	(0.53)	(2.46)
Crisis$_{t}$	0.00366***	-0.00354	0.00278***	-0.0649***	-0.0249***	-0.0701***
	(4.80)	(-0.24)	(3.45)	(-33.45)	(-4.94)	(-33.05)
Obs	60,448	9,302	51,146	62,402	9,665	52,805
Wald's test	1,444.48***	272.52***	1,425.27***	12,528.39***	2,136.46***	10,746.68***
ρ	0.0957475	0.91819836	0.09816314	0.72047335	0.73829621	0.72088362

Notes: *, **, *** statistically significant at the 10, 5 and 1% level, respectively.

Table 7:
Robustness test, 1998-2009

z-statistics in parenthesis. Panel data random effect regression.
The whole regressions include industry and country dummies.

Variable	$r_{it}^{TC} - \overline{r_{kt}^{TC}}$			$r_{it}^{TC} - r_{it}^{B}$		
	Whole sample	Large firms	SME	Whole sample	Large firms	SME
Intercept	-0.00593**	-0.0149***	-0.00399	-0.00308	-0.00784	-0.00165
	(-3.03)	(-3.35)	(-1.94)	(-1.26)	(-1.43)	(-0.65)
Δr_{it}^{B}	0.00642	0.0328	0.00386			
	(1.29)	(1.80)	(0.75)			
Δr_{it}^{S}	0.00195***	0.00154***	0.00299***	0.00243***	0.00167***	0.00353***
	(8.03)	(4.13)	(8.12)	(11.06)	(4.10)	(11.87)
ΔB_{it}	0.00208*	0.00452	0.00148	0.00126	0.00852*	-0.000103
	(2.14)	(1.52)	(1.44)	(1.15)	(2.53)	(-0.09)
ΔTC_{it}	-0.00124	-0.00106	-0.00126	-0.00597***	-0.00909**	-0.00558***
	(-1.39)	(-0.36)	(-1.34)	(-5.89)	(-2.72)	(-5.28)
ΔCAP_{it}	-0.00219	-0.00299	-0.00149	-0.00188	-0.00229	-0.00155
	(-1.89)	(-0.99)	(-1.18)	(-1.44)	(-0.67)	(-1.09)
$\Delta EONIA_{t}$	0.00203***	0.000997***	0.00220***	-0.00153***	-0.00282***	-0.00135***
	(25.81)	(4.34)	(26.21)	(-17.35)	(-10.86)	(-14.31)
ΔLTA_{it}	-0.00202***	-0.00412***	-0.00150***	0.00181***	-0.000462	0.00233***
	(-5.16)	(-4.00)	(-3.50)	(4.11)	(-0.40)	(4.85)
ΔCFA_{it}	0.00435***	0.00107	0.00455***	-0.00230	-0.000624	-0.00298*
	(3.58)	(0.30)	(3.52)	(-1.68)	(-0.15)	(-2.05)
Crisis$_{t}$	-0.00268***	-0.00306***	-0.00255***	-0.000571**	-0.000608	-0.000576**
	(-15.16)	(-5.90)	(-13.48)	(-2.85)	(-1.03)	(-2.69)
Obs	60,493	9,312	51,181	60,800	9,372	51,428
Wald's test	1,772.01***	192.65***	1,717.27***	767.46***	279.30***	607.92***
ρ	0.36332186	0.33372429	0.36446765	0.42686361	0.40025387	0.43427493

Notes: *, **, *** statistically significant at the 10, 5 and 1% level, respectively.

References
(Essay III: Monetary policy, implicit interest rate, and relative net trade credit)

Aktas, Nihat; Eric de Bodt; Frédéric Lobez and Jean-Christophe Statnik. 2012. The Information Content of Trade Credit. Journal of Banking & Finance 36, 1402-1413.

Alphonse, Pascal; Jacqueline Ducret and Eric Séverin. 2006. When Trade Credit Facilitates Access to Bank Finance: Evidence from US Small Business Data.

Altunbas, Yener; Leonardo Gambacorta and David Marques-Ibanez. 2010. Bank Risk and Monetary Policy. Journal of Financial Stability 6, 121-129.

Altunbas, Yener; Leonardo Gambacorta and David Marques-Ibanez. 2009. Securitisation and the Bank Lending Channel. European Economic Review 53, 996-1009.

Altunbas, Yener; Simone Manganelli and David Marques-Ibanez. 2012. Bank Risk During the Financial Crisis: Do Business Models Matter? Bangor Business School. Working Paper BBSWP/12/003.

Ashcraft, Adam B. 2006. New Evidence on the Lending Channel. Journal of Money, Credit, and Banking 38, 751-775.

Ashcraft, Adam B. and Murillo Campello. 2007. Firm Balance Sheets and Monetary Policy Transmission. Journal of Monetary Economics 54, 1515-1528.

Atanasova, Christina V. 2007. Access to Institutional Finance and the use of Trade Credit. Financial Management 36, 49-67.

Atanasova, Christina V. and Nicholas Wilson. 2004. Disequilibrium in the UK Corporate Loan Market. Journal of Banking and Finance 28, 595-614.

Atanasova, Christina V. and Nicholas Wilson. 2003. Bank Borrowing Constraints and the Demand for Trade Credit: Evidence from Panel Data. Managerial and Decision Economics 24, 503-514.

Benito, Andrew. 2005. Financial Pressure, Monetary Policy Effects and Inventories: Firm-Level Evidence from a Market-Based and a Bank-Based Financial System. Economica 72, 201-224.

Bernanke, Ben S. and Alan S. Blinder. 1992. The Federal Funds Rate and the Channels of Monetary Transmission. American Economic Review 82, 901-921.

Bernanke, Ben S. and Alan S. Blinder. 1988. Credit, Money, and Aggregate Demand. American Economic Review 78, 435-439.

Bernanke, Ben S. and Mark Gertler. 1995. Inside the Black Box: The Credit Channel of Monetary Policy Transmission. Journal of Economic Perspectives 9, 27-48.

Bernanke, Ben S. and Mark Gertler. 1989. Agency Cost, Net Worth, and Business Fluctuations. American Economic Review 79, 14-31.

Bernanke, Ben; Mark Gerter and Simon Gilchrist. 1996. The Financial Accelerator and the Flight to Quality. Review of Economics and Statistics 78, 1-15.

Biais, Bruno and Christian Gollier. 1997. Trade Credit and Credit Rationing. Review of Financial Studies 10, 903-937.

Black, Lamont K. and Richard J. Rosen. 2007. How the Credit Channel Works: Differentiating the Bank Lending Channel and the Balance Sheet Channel.

Boissay, Frédéric and Reint Gropp. 2007. Trade Credit Defaults and Liquidity Provision by Firms. ECB Working Paper Series No. 753.

Bolton, Patrick and Xabier Freixas. 2000. Equity, Bonds, and Bank Debt: Capital Structure and Financial Market Equilibrium Under Asymmetric Information. Journal of Political Economy 108, 324-351.

Bougheas, Spiros; Simona Mateut and Paul Mizen. 2009. Corporate Trade Credit and Inventories: New Evidence of a Trade-Off from Accounts Payable and Receivable. Journal of Banking and Finance 33, 300-307.

Bougheas, Spiros; Paul Mizen and Cihan Yalcin. 2006. Access to External Finance: Theory and Evidence on the Impact of Monetary Policy and Firm-Specific Charasteristics. Journal of Banking and Finance 30, 199-227.

Braun, Matias and Claudio Raddatz. 2008. Politics of Financial Development: Evidence from Trade Liberalization. Journal of Finance 63, 1469-1508.

Brennan, Michael J.; Vojislav Maksimovic and Josef Zechner. 1988. Vendor Financing. Journal of Finance 43, 1127-1141.

Burkart, Mike and Tore Ellingsen. 2004. In-Kind Finance: A Theory of Trade Credit. American Economic Review 94, 569-590.

Burkart, Mike; Tore Ellingsen and Mariassunta Gianneti. 2006. What You Sell is what You Lend? Explaining Trade Credit Contract. Review of Financial Studies 24, 1261-1298.

Carbó, Santiago and Rafael López. 2009. Bank-Lending Channel and Non-Financial Firms: Evidence for Spain. Spanish Economic Review 11, 125-140.

Carbó, Santiago; Francisco Rodriguez and Gregory F. Udell. 2012. Trade credit, the financial crisis and firms' access to finance. Mimeo.

Choi, Woon Gyu and Yungsan Kim. 2005. Trade Credit and the Effect of Monetary Macro-Financial Shocks: Evidence from U.S. Panel Data. Journal of Financial and Quantitative Analysis 40, 897-925.

Clauss, Iris. 2011. Inside the Black Box: How Important is the Credit Channel Relative to the Interest and Exchange Rate Channels? Economic Modelling 28, 1-12.

Cook, Lisa D. 1999. Trade Credit and Bank Finance: Financing Small Firms in Russia. Journal of Business Venturing 14, 493-518.

Cull, Robert; Lixin Collin Xu and Tian Zhu. 2009. Formal Finance and Trade Credit during China's Transition. Journal of Financial Intermediation 18, 173-192.

Cuñat, Vicente. 2007. Trade Credit: Suppliers as Debt Collectors and Insurance Providers. Review of Financial Studies 20, 491-527.

Danielson, Morris G. and Jonathan A. Scott. 2004. Bank Loan Availability and Trade Credit Demand. Financial Review 39, 579-600.

Dass, Nishant; Jayant R. Kale and Vikram K. Nanda. 2011. Trade Credit, Relationship-Specific Investment, and Product-Market Power. Working Paper SSRN <http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1585273>

De Blasio, Guido. 2005. Does Trade Credit Substitute for Bank Credit? Evidence from Firm-Level Data. Economic Notes 34, 85-112.

Deloof, Marc and Marc Jegers. 1996. Trade Credit, Product Quality, and Intragroup Trade: Some European Evidence. Financial Management 25, 33-43.

Deloof, Marc and Marc Jergers. 1999. Trade Credit and, Corporate Groups, and the Financing of Belgian Firms. Journal of Finance, Business, and Accounting 26, 945-966.

Demirgürç-Kunt, Asli and Vijislav Maksimovc. 2001. Firm as Financial Intermediaries. Evidence from Trade Credit Data.

Diamond, Douglass W. 1991. Monitoring and Reputation: The Choice between Bank Loans and Directly Placed Debt. Journal of Political Economy 99, 689-721.

Diamond, Douglass W. 1984. Financial Intermediation and Delegated Monitoring. Review of Economic Studies 51, 393-414.

Elliehausen, Gregory E. and John D. Wolken. 1993. The Demand for Trade Credit: An Investigation of Motives for Trade Credit use by Small Businesses. Board of Governors of the Federal Reserve System.

Emery, Gary W. 1984. A Pure Financial Explanation for Trade Credit. Journal of Financial and Quantitative Analysis 19, 271-285.

Emery, Garry and N. Nayar. 1998. Product Quality and Payment Policy. Review of Finance and Accounting 10, 269-284.

Fabbri, Daniela and Anna Maria C. Menichini. 2010. Trade Credit, Collateral Liquidation, and Borrowing Constraints. Journal of Financial Economics forthcoming, .

Fernández de Guevara, Juan; Joaquín Maudos and Francisco Pérez. 2007. Integration and Competition in the European Financial Markets. Journal of International Money and Finance. 26, 26-45.

Fukuda, Shin-ichi; Munehisa Kayusa and Kentaro Akashi. 2006. The Role of Trade Credit for Small Firms: An Implication for Japan's Banking Crisis. Center for Advanced Research in Finance, University of Tokyo CARF-F-078.

Gelter, Mark and Simon Gilchrist. 1994. Monetary Policy, Business Cycles, and the Behavior of Small Manufacturing Firms. Quarterly Journal of Economics 109, 309-340.

Gelter, Mark and Simon Gilchrist. 1993. The Role of Credit Market Imperfections in the Monetary Transmission Mechanism: Arguments and Evidence. Scandinavian Journal of Economics 95, 43-64.

Giannetti, Mariassunta; Mike Burkart and Tore Ellingsen. 2011. What You Sell is what You Lend? Explaining Trade Credit Contracts. Review of Financial Studies 24, 1261-1298.

Guariglia, Alessandra and Simona Mateut. 2006. Credit Channel, Trade Credit Channel, and Inventory Investment: Evidence from a Panel of UK Firms. Journal of Banking and Finance 30, 2835-2856.

Hoshi, Takeo; Anil Kashyap and David Scharftein. 1991. Corporate Structure, Liquidity, and Investment: Evidence from Japanese Industrial Groups. Quarterly Journal of Economics 106, 33-60.

Hoshi, Takeo; Anil Kashyap and David Scharftein. 1990. The Role of Banks in Reducing the Cost of Financial Distress in Japan. Journal of Financial Economics 27, 67-88.

Huang, Hui; Shi Xiaojun and Shunming Zhang. 2011. Counter-Cyclical Substitution between Trade Credit and Bank Credit. Journal of Banking and Finance 35, 1859-1878.

Huang, Zhangkai. 2003. Evidence of a Bank Lending Channel in the UK. Journal of Banking and Finance 27, 491-510.

Hubbard, R. Glenn. 1998. Capital-Market Imperfections and Investment. Journal of Economic Literature 36, 193-225.

Kashyap, Anil K. and Jeremy C. Stein. 2000. What do a Million Observations Banks Say about the Transmission of Monetary Policy? American Economic Review 90, 407-428.

Kashyap, Anil K.; Jeremy C. Stein and David W. Wilcox. 1993. Monetary Policy and Credit Conditions: Evidence from the Composition of External Finance. American Economic Review 83, 78-98.

King, Robert G. and Charles I. Plosser. 1984. Money, Credit, and Prices in a Real Business Cycle. American Economic Review 74, 363-380.

Kishan, Ruby P. and Timothy P. Opiela. 2012. Monetary Policy, Bank Lending, and the Risk-Pricing Channel. Journal of Money, Credit and Banking 44, 573-602.

Kishan, Ruby P. and Timothy P. Opiela. 2006. Bank Capital and Loan Asymmetry in the Transmission of Monetary Policy. Journal of Banking and Finance 30, 259-285.

Kishan, Ruby P. and Timothy P. Opiela. 2000. Bank Size, Bank Capital, and the Bank Lending Channel. Journal of Money, Credit, and Banking 32, 121-141.

Klapper, Leora; Luc Laeven and Raghuram Rajan. 2012. Trade Credit Contracts. Review of Financial Studies 25, 838-867.

Kohler, Marion; Erik Britton and Tony Yates. 2000. Trade Credit and the Monetary Transmission Mechanism.

Long, Michael S.; Ileen B. Malitz and S. Abraham Ravid. 1993. Trade Credit, Quality Guarantees, and Product Marketability. Financial Management 22, 117-127.

Love, Inessa and Rida Zaidi. 2010. Trade Credit, Bank Credit, and Financial Crisis. International Review of Finance 10, 125-147.

Mateut, Simona. 2005. Trade Credit and Monetary Policy Transmission. Journal of Economic Surveys 19, 655-670.

Mateut, Simona; Spiros Bougheas and Paul Mizen. 2006. Trade Credit, Bank Lending and Monetary Policy Transmission. European Economic Review 50, 603-629.

Maudos, Joaquín and Juan Fernández de Guevara. 2007. The Cost of Market Power in Banking: Social Welfare Loss Vs. Cost Inefficiency. Journal of Banking and Finance. 31, 2103-2125.

Maudos, Joaquín and Juan Fernández de Guevara. 2004. Factors Explaining the Interest Margins in the Banking Sectors of the European Union. Journal of Banking and Finance. 28, 2259-2281.

Myers, Stewart C. 1984. The Capital Structure Puzzle. Journal of Finance 39, 575-592.

Myers, Stewart C. and Nicholas S. Majluf. 1984. Corporate Financing and Investment Decisions when Firms have Information that Investors do Not have. Journal of Financial Economics 13, 187-221.

Ng, Chee K.; Janet Kiholm Smith and Richard L. Smith. 1999. Evidence on the Determinants of Credit Terms used in Interfirm Trade. Journal of Finance 54, 1109-1129.

Nilsen, Jeffrey H. 2002. Trade Credit and Bank Lending Channel. Journal of Money, Credit, and Banking 34, 226-253.

Oliner, Stephen D. and Glenn D. Rudebusch. 1996a. Is there a Broad Credit Channel for Monetary Policy? FRBSF Economic Review 1, 3-13.

Oliner, Stephen D. and Glenn D. Rudebusch. 1996b. Monetary Policy and Credit Conditions: Evidence from the Composition of External Finance: Comment. American Economic Review 86, 300-309.

Oliner, Stephen D. and Glenn D. Rudebusch. 1995. Is there a Bank Lending Channel for Monetary Policy? Economic Review-Federal Reserve Bank of San Francisco 2, 3-20.

Ono, M. 2001. Determinats of Trade Credit in the Japanese Manufacturing Sector. Journal of Japanese and International Economies 15, 160-177.

Petersen, Mitchell A. and Raghuram G. Rajan. 1997. Trade Credit: Theories and Evidence. Review of Financial Economics. 10, 226-253.

Petersen, Mitchell A. and Raghuram G. Rajan. 1995. The Effect of Credit Market Competition on Lending Relationships. Quarterly Journal of Economics. 110, 407-443.

Petersen, Mitchell A. and Raghuram G. Rajan. 1994. The Benefits of Lending Relationships: Evidence from Small Business Data. Journal of Finance. 49, 3-37.

Pike, Richard; Nam Sang Cheng; Karen Cravens and Dawne Lamminmaki. 2005. Trade Credit Terms: Asymmetric Information and Price Discrimination Evidence from Three Continents. Journal of Business, Finance, and Accounting 32, 1197-1236.

Raddatz, Claudio. 2010. Credit Chains and Sectoral Comovement: Does the Use of Trade Credit Amplify Sectoral Shocks? The Review of Economics and Statistics 92, 985-1003.

Raddatz, Claudio. 2006. Liquidity Needs and Vulnerability to Financial Underdevelopment. Journal of Financial Economics 80, 677-722.

Rajan, Raghuram G. and Luigi Zingales. 1998. Financial Dependence and Growth. American Economic Review. 88, 559-586.

Ramey, Valerie A. 1992. The Source of Financial Fluctuations in Money: Evidence from Trade Credit. Journal of Monetary Economics 30, 171-193.

Repullo, Rafael and Javier Suarez. 2000. Entrepeneurial Moral Hazard and Bank Monitoring: A Model of the Credit Channel. European Economic Review 44, 1931-1950.

Romer, Christina D. and David H. Romer. 1994. Monetary Policy Matters. Journal of Monetary Economics 34, 75-88.

Romer, Christina D. and David H. Romer. 1990. New Evidence on the Monetary Transmission Mechanism. Brookings Papers on Economic Activity 1, 149-213.

Stein, Jeremy C. 1998. An Adverse-Selection Model of Bank Asset and Liability Management with Implication for the Transmission of Monetary Policy. RAND Journal of Economics 29, 466-486.

Tsuruta, Daisuke. 2010. How does Small Businesses Finance their Growth Opportunities? the Case of Recovery from the Lost Decade in Japan.

Tsuruta, Daisuke. 2007. Credit Contagion and Trade Credit Supply: Evidence from Small Business Data in Japan.

Uesugi, Iichiro and Guy M. Yamashiro. 2008. How Trade Credit Differs from Loans: Evidence from Japanese Trading Companies.

Wilner, Benjamin S. 2000. The Explotation of Relationships in Financial Distress: The Case of Trade Credit. Journal of Finance 55, 153-178.

Wilson, Nicholas and Barbara Summers. 2002. Trade Credit Terms Offered by Small Firms: Survey Evidence and Empirical Analysis. Journal of Business, Finance, and Accounting 29, 317-351.

Conclusions

1. Summary of conclusions

The three essays presented in this dissertation contribute to increase the understanding on the relationship between bank market structure and firm investment, monetary policy, trade credit, and firm exports. As a general, in this section we offer a brief summary of the main conclusions presented in this dissertation.

a) The first essay of this dissertation is motivated by the recent strand of financial literature which advocates that bank lending availability constitutes one of the most relevant question to foster firm financing (see Berger and Udell, 1998, 2002, 2006). Those difficulties are reflected in the access to external finance are mirrored in the degree of asymmetric information which could be followed by financial constraints which difficult firm growth or shutting down (see Canales and Nanda, forthcoming). Recently, a few empirical papers have shown that bank lending availability and bank market concentration are closely related with the creation of informational rents (see Ogura, 2010, 2012; Petersen and Rajan, 1995), whilst other studies have find a positive association between relationship lending by investing specific resources with firms (see Berger, 1995; Boot and Thakor, 2000; Carbó *et al.*, 2009; Degryse and Ongena, 2007; Elsas, 2005; Scott and Dunkelberg, 2003, 2010; Presbitero and Zazzaro, 2011).

Motivated by the arguments explained above, in this dissertation we have tested the main implications of bank market power on firm investment rate from a dynamic perspective. Of the two main findings shown in the first essay, one suggests that bank market power exerts a negative effect on firm investment rate in the short term. This result is in line with previous literature which advocates that bank market concentration dampens firm growth or even the creation of new firms (see Black and Strahan, 2002; Bonaccorsi di Patti and Dell'Ariccia, 2004; Bonaccorsi Di Patti and Gobbi, 2007;

Cetorelli and Gambera, 2001; Cetorelli, 2004; Cetorelli and Strahan, 2006; Degryse *et al.*, 2011; Zarutskie, 2006). This essay attempts to go one step forward estimating the effects of bank market power in the long term suggesting that firm investment rate is recovered. This result could be interpreted through bank-firm relationship which is also improved during subsequent periods, and hence bank financing is also recovered in the long term (see Ogura, 2010, 2012). In line with our results, Bonaccorsi Di Patti and Gobbi (2007) who also relate firm's credit issued by banks involved in M&A processes, find that an increase in firm investment rate in the long term for firms which banks are involved in M&A processes.

Additionally, we also perform Granger causality test to determine the direction between bank market power and firm investment rate. Our results suggest that bank market power is a determinant of firm investment rate, but not in the opposite way. The robustness of this finding is robust whether we substitute the Lerner index for other measures of bank concentration such as the HHI and C5 index. Finally, we also perform the cash flow-investment sensitivity analysis as well as the effects of bank market power on internal funds. Our results confirm that bank market power is cash flow sensitive to investment reducing the impact of cash flow in the long term (see Bonaccorsi Di Patti and Gobbi, 2007).

b) Bank lending availability not only affects to firm's investment in fixed assets, as we have presented before, but also have important repercussions on the firm's investment in current assets, and hence on liquidity management (see Acharya *et al.*, 2007; Almeida *et al.*, 2004, 2010; Caglayan *et al.*, 2012; Claessens *et al.*, forthcoming; Ding *et al.*, forthcoming), as it is presented in the second essay of this dissertation. Furthermore, the recent financial literature have shown evidence that the lack of credit availability have negative repercussions on firm exports because of firms need to

overcome a certain level of fixed cost in order to penetrate into foreign markets (see Albornoz *et al.*, forthcoming). Additionally, financial literature also have shown that investment in working capital could be used as a useful tool in order to alleviate financial constraints in the short term (see Ding *et al.*, forthcoming; Wu *et al.*, forthcoming). Closely related with this essay, Claessens *et al.* (forthcoming) find that the financial crisis has reduced availability of working capital, and hence firm's sales have been also reduced, whist Caglayan *et al.* (2012) find that the decline in inventory investment permits to firms maintain more liquid assets or to extend more trade credit relative to trade debit received from their suppliers. Summarizing, financial constraints is a relevant facto to adapt production chain to demand shocks.

Motivated by the theoretical arguments explained above, we have analysed the firm export behaviour from a twofold perspective: on the one hand, considering whether the firm is an exporter firm and, on the other hand, considering the amount of firm's sales to foreign markets. We find that financial constraints constitute an important obstacle to access to foreign markets, which means that the lack of credit availability reduces the probability of become in an exporter firm. Moreover, financial constraints also reduce the amount of firm's foreign sales over total sales. These results are in line with those presented by Bellone *et al.* (2010) and Bricongne *et al.* (2012), among others. The main difference of our work with respect to other papers is on the methodology, since we employ survey data in order to obtain the direct response of entrepreneurs whether firm is financially constrained, as well as the degree of credit restrictions. Nevertheless, those results are robust whether financial constraints are estimated through the disequilibrium model.

Regarding the effect of liquidity management on firm's exports, we find that longer periods of working capital, measured as CCC and NTC, lead to firms to increase

the probability of orientate their activity to foreign markets, as well as to increase the volume of foreign sales over total sales. Because of CCC and NTC are a composite index of the sum of collection period, inventory period minus credit period, we should focus our analysis on the sign of each indicator on firm export variables. We find that longer collection period as well as inventory period increases the probability of being an export firm, as well as increase the volume of sales for foreign markets. On the other hand, credit period is found to be negative related to the probability of being an exporter and the volume of foreign sales.

c) The third essay of this dissertation is focused on the study of trade credit. The global financial crisis has supposed a reduction in trade finance. This question gain relevance because of this kind of finance in crisis times since a delay, or even delinquency, in payments or lack of availability, supposes an increase of financial pressure for firms in order to affect their investment decisions (see Carbó *et al.*, 2012). We find several arguments which advocate that the provision of trade credit is closely related to the bank lending availability. In this line, financial literature is divided on the question whether trade credit is complementary to bank lending, the so called *complementarity hypothesis* (see Burkart and Ellingsen, 2004; Carbó *et al.*, 2012; Cull *et al.*, 2009; Danielson and Scott, 2004; Giannetti *et al.*, 2011, among others) and on the other hand, we also find argument suggesting that trade credit and bank lending are substitutes, the so called *substitution hypothesis* (see Fukuda *et al.*, 2006; Huang *et al.*, 2011); Tsuruta, 2007, 2010; Uesugi and Yamashiro, 2008, among others).

Literature on monetary policy has argued that a tightening on monetary policy is transmitted to an increase of interest rates of loans, the so called *interest rate channel* (see Clauss, 2011, among others). Economic literature has also considered the role of bank in allocating credit in line with the stance of monetary policy. The Bernanke and

Blinder's (1988) *bank lending channel* advocates that banks play an important role in the financial system because of they have important advantages in order to solve asymmetric information problems. Recent literature has continued digging on this view suggesting that the main implication of the bank lending channel for firms' credit and investment is that monetary policy exerts a greater impact on the most bank dependent firms (see Kashyap and Stein, 2000) in particular for the smallest ones (see Carbó and López, 2009; Huang *et al.*, 2011). The most recent strand of economic literature also considers the role of bank risk exposure in determining loan supply and in sheltering them from a tightening of monetary policy. Low-risk banks can better shield their lending from monetary tightening as they have better and easier access to fund raising (see Altunbas *et al.*, 2009, 2010, 2012). In this line, the *broad channel view* stresses that that all forms of external finance are imperfect substitutes for internal funds. Therefore, those asymmetries of information induce to a cost premium for external funds as a compensation for the expected cost for monitoring cost, and this premium depends on the stance of monetary policy which can deteriorate the borrower's balance sheet and reducing the collateral (see Oliner and Rudebusch, 1995, 1996a, 1996b). Regarding internal funds, literature on monetary policy have also considered that shocks in monetary policy is transmitted to the volume, and demand of trade credit, the so called *trade credit channel* (see Atanasova and Wilson, 2003, 2004; Guariglia and Mateut, 2006; Mateut, 2005; Mateut *et al.*, 2006; Nielsen, 2002, among others). Following this way, we focus our research question whether shocks in monetary policy could also be transmitted to the (implicit) interest rate of trade credit.

To answer this question, we have conducted two useful measures to proxy the price for trade credit, called implicit interest rate (IIR), and the relative position for trade finance within a closed range and hence, making measurement comparable between

firms of different size called relative net trade credit (RNTC). Our main finding confirms that a tightening in monetary policy leads to an increase in the cost of trade credit in line with the *interest rate channel* view (see Clauss (2011). Additionally, as a robustness check, we have also employed the average bank price for credit (*via credit channel*) on the cost of trade credit and we obtain similar results (see Carbó and López, 2009; Carbó *et al.*, 2012). In the light of our results, we can conclude that as well the decisions of increase the reference interest rates of monetary policy are transmitted to an increase in the cost of bank financing; it is also transmitted to an augment in the cost of trade credit. To our knowledge, this is the first paper that analyses the effect of monetary policy on the cost of trade credit.

Monetary policy also has an important effect on the RNTC. We also find that a tightening of monetary policy leads to firm to become in net trade borrowers. Our results demonstrate that during rising of macroeconomic -or bank- interest rates financial motives of trade credit provision are present rather than those related with transaction motives (see Atanasova, 2007; Atanasova and Wilson, 2003, 2004; Carbó *et al.*, 2012b, among others). Additionally, we have also divided the sample considering firm size. We find that that the impact of monetary policy is higher for larger firms since they could borrow more financing than SMEs. We are also concerned to the effects of financial crisis on firms' trade credit position. The results show that financial crisis has inverted the process because of the cut of bank credit leads to firms to borrow trade credit –turning around in trade borrowers-. Moreover, the effect of financial crisis is higher for SMEs because of they count with a higher dependence of trade credit whilst they were more affected to financial constraint derived to lending restrictions derived of this event (see Carbó and López, 2009; Huang *et al.*, 2011; Kashyap and Stein, 2000).

We also extend our research to study the firm position with respect to competitors through analysing the distance between the IIR paid by the firm and the average IIR for each industrial sector (*competition effect*) and we extend our analysis to study of complementarity between trade credit and bank financing (*complementarity effect*). Regarding *competition effect*, we find that a tight in monetary policy leads to create divergence among the diverse IIR paid by firms in the same sector. This effect might be the results of the increasing cost of trade credit. Furthermore, we also find that a tightening in monetary policy reduces the distance between the prices of both form of financing. This result is also important for economic literature because of supports the *complementarity hypothesis* in a tightening monetary policy environment.

2. Directions for future research

The main conclusion of this dissertation is that research on topics related to banking and corporate finance is still incomplete, particularly inside the field of bank market structure, credit constraints and trade credit. Additionally, empirical research remains to be conducted. The financial crisis has engendered new studies on securitization which could be also an important influence factor for the provision of trade credit, since financial literature has demonstrate the relationship between both form of firm financing.

Asset securitization has become one of the more important financial techniques for banks in order to create liquidity passing from illiquid long term loans to liquid tradable instruments. This transformation is possible through the use of special purpose vehicle which consists in a separate financial institution from the main bank. This technique allows to banks to transform heterogeneous assets into liquid securities which

are more homogeneous and suitable for sale to third parties. The range of assets subject to securitization process is wide and includes loan mortgages, credit card and receivables, bonds, auto loans, and loans to SME, among others. Over the past decade, Spain has established as one of the most important European countries in issuing securitized banking assets. Although off-balance-sheet securitization appears to have been subject to regulation for the first time in 1992, it was not until 1998 when the securitization of all kind of assets was permitted (see Cardone-Riportella *et al.*, 2010).

The start point of this proposal is the paper presented by Carbó *et al.* (2012a) who demonstrates that both relationship banking and securitization reduces credit rationing in normal periods. The authors show that firms which are implicated in relationships with banks involved enjoy lower level of credit constraints in normal period, whilst on the other hand; those firms reflect credit constraints in crisis times. Economic literature also shows how securitization influences on banks' willingness to grant loans. In this sense, credit derivatives improve banks' liquidity and could enhance credit provision to firms (see Drucker and Puri, 2009; Hirtle, 2009). The main implication of this result is that securitization could improve firms' access to bank credit via increasing liquidity. In this sense, Jimenez *et al*. (2010) show that banks with better liquidity position through securitization, more precisely, they find that firms associated with banks with weaker capital or liquidity have a lower probability to obtain to obtain a loan. Moreover, loan supply restrictions cannot be fully recovered by turning to other banks creating a crowing out effect. Therefore, the main objective of this research is to demonstrate the existence of direct links between the banks' securitization activity and the increment of the volume of trade credit.

References
(Conclusions section):

Acharya, Viral V.; Heitor Almeida and Murillo Campello. 2007. Is Cash Negative Debt? A Hedging Perspective on Corporate Financial Policies. Journal of Financial Intermediation 16, 515-554.

Albornoz, Facundo; Héctor F. Calvo Pardo; Gregory Corcos and Emanuel Ornelas. Sequential Exporting. Journal of International Economics .

Almeida, Heitor; Murillo Campello and Michael S. Weisbach. 2010. Corporate Financial and Investment Policies when Future Financing is Not Frictionless. Journal of Corporate Finance forthcoming, .

Almeida, Heitor; Murillo Campello and Michael S. Weisbach. 2004. The Cash Flow Sensitivity of Cash. Journal of Finance 59, 1777-1804.

Altunbas, Yener; Leonardo Gambacorta and David Marques-Ibanez. 2010. Bank Risk and Monetary Policy. Journal of Financial Stability 6, 121-129.

Altunbas, Yener; Leonardo Gambacorta and David Marques-Ibanez. 2009. Securitisation and the Bank Lending Channel. European Economic Review 53, 996-1009.

Altunbas, Yener; Simone Manganelli and David Marques-Ibanez. 2012. Bangor Business School. Working Paper BBSWP/12/003.

Atanasova, Christina V. 2007. Access to Institutional Finance and the use of Trade Credit. Financial Management 36, 49-67.

Atanasova, Christina V. and Nicholas Wilson. 2004. Disequilibrium in the UK Corporate Loan Market. Journal of Banking and Finance 28, 595-614.

Atanasova, Christina V. and Nicholas Wilson. 2003. Bank Borrowing Constraints and the Demand for Trade Credit: Evidence from Panel Data. Managerial and Decision Economics 24, 503-514.

Bellone, Flora; Patrick Musso; Lionel Nesta and Stefano Schiavo. 2010. Financial Constraints and Firm Export Behaviour. World Economy 33, 347-373.

Berger, Allen N. 1995. The Profit-Structure Relationship in Banking. Test for Market-Power and Efficient Structure Hypotheses. Journal of Money, Credit, and Banking 27, 404-431.

Berger, Allen N. and Gregory F. Udell. 2006. A More Complete Conceptual Framework for SME Finance. Journal of Banking and Finance. 30, 2945-2966.

Berger, Allen N. and Gregory F. Udell. 2002. Small Business Credit Availability and Relationship Lending: The Importance of Bank Organisatinal Structure. Economic Journal 112, 32-53.

Berger, Allen N. and Gregory F. Udell. 1998. The Economics of Small Business Finance: The Role of Private Equity and Debt Markets in the Financial Growth Cycle. Journal of Banking and Finance 22, 613-673.

Bernanke, Ben S. and Alan S. Blinder. 1988. Credit, Money, and Aggregate Demand. American Economic Review 78, 435-439.

Black, Sandra E. and Philip E. Strahan. 2002. Entrepreneurship and Black Credit Availability. Journal of Finance 57, 2807-2833.

Bonaccorsi di Patti, Emilia and Giovanni Dell'Ariccia. 2004. Bank Competition and Firm Creation. Journal of Money, Credit and Banking 36, 225-251.

Bonaccorsi di Patti, Emilia and Giorgio Gobbi. 2007. Winners or Losers? The Effects of Banking Consolidation on Corporate Borrowers. The Journal of Finance 62, 669-695.

Boot, Arnoud W. A. and Anjan V. Thakor. 2000. Can Relationship Banking Survive Competition? Journal of Finance 55, 679-713.

Bricongne, Jean-Charles; Lionel Fontagné; Guillaume Gaulier; Daria Taglioni and Vincent Vicard. 2012. Firms and the Global Crisis: French Exports in the Turmoil. Journal of International Economics 87, 134-146.

Burkart, Mike and Tore Ellingsen. 2004. In-Kind Finance: A Theory of Trade Credit. American Economic Review 94, 569-590.

Caglayan, Mustafa; Sara Maioli and Simona Mateut. 2012. Inventories, Sales Uncertainty, and Financial Strength. Journal of Banking & Finance 36, 2512-2521.

Canales, Rodrigo and Ramana Nanda, forthcoming. A Darker Side to Decentralized Banks: Market Power and Credit Rationing in SME Lending. Journal of Financial Economics.

Carbó, Santiago and Rafael López. 2009. Bank-Lending Channel and Non-Financial Firms: Evidence for Spain. Spanish Economic Review 11, 125-140.

Carbó, Santiago; Hans Degryse and Francisco Rodriguez. 2012a. Lending Relationships and Credit Rationing: The Impact of Securitization. Mimeo.

Carbó, Santiago; Francisco Rodriguez and Gregory F. Udell. 2012b. Trade credit, the financial crisis and firms' access to finance. Mimeo.

Carbó, Santiago; Francisco Rodriguez and Gregory F. Udell. 2009. Bank Market Power and SME Financing Constraints. Review of Finance 13, 309-340.

Cardone-Riportella, Clara; Reyes Samaniego-Medina and Antonio Trujillo-Ponce. 2010. What Drives Bank Securitisation? the Spanish Experience. Journal of Banking & Finance 34, 2639-2651.

Cetorelli, Nicola. 2004. Real Effects of Bank Competition. Journal of Money, Credit and Banking 36, 543-558.

Cetorelli, Nicola and Michele Gambera. 2001. Banking Market Structure, Financial Dependence and Growth: International Evidence from Industry Data. Journal of Finance 56, 617-648.

Cetorelli, Nicola and Philip E. Strahan. 2006. Finance as a Barrier to Entry: Bank Competition and Industry Structure in Local U.S. Markets. Journal of Finance. 61, 437-461.

Claessens, Stijn; Hui Tong and Shang-Jin Wei, forthcoming. From the Financial Crisis to the Real Economy: Using Firm-Level Data to Identify Transmission Channels. Journal of International Economics.

Clauss, Iris. 2011. Inside the Black Box: How Important is the Credit Channel Relative to the Interest and Exchange Rate Channels? Economic Modelling 28, 1-12.

Cull, Robert; Lixin Collin Xu and Tian Zhu. 2009. Formal Finance and Trade Credit during China's Transition. Journal of Financial Intermediation 18, 173-192.

Danielson, Morris G. and Jonathan A. Scott. 2004. Bank Loan Availability and Trade Credit Demand. Financial Review 39, 579-600.

Degryse, Hans and Steven Ongena. 2007. The Impact of Competition on Bank Orientation. Journal of Financial Intermediation 16, 399-424.

Degryse, Hans; Nancy Masschelein and Janet Mitchell. 2011. Staying, Dropping, or Switching: The Impacts of Bank Mergers on Small Firms. Review of Financial Studies 24, 1102-1140.

Ding, Sai; Alessandra Guariglia and John Knight, forthcoming. Investment and Financing Constraints in China: Does Working Capital Management make a Difference? Journal of Banking & Finance.

Drucker, Steven and Manju Puri. 2009. On Loan Sales, Loan Contracting, and Lending Relationships. Review of Financial Studies 22, 2835-2872.

Elsas, Ralf. 2005. Empirical Determinants of Relationship Lending. Journal of Financial Intermediation 14, 32-57.

Fukuda, Shin-ichi; Munehisa Kayusa and Kentaro Akashi. 2006. The Role of Trade Credit for Small Firms: An Implication for Japan's Banking Crisis. Center for Advanced Research in Finance, University of Tokyo CARF-F-078.

Guariglia, Alessandra and Simona Mateut. 2006. Credit Channel, Trade Credit Channel, and Inventory Investment: Evidence from a Panel of UK Firms. Journal of Banking and Finance 30, 2835-2856.

Giannetti, Mariassunta; Mike Burkart and Tore Ellingsen. 2011. What You Sell is what You Lend? Explaining Trade Credit Contracts. Review of Financial Studies 24, 1261-1298.

Hirtle, Beverly. 2009. Credit Derivatives and Bank Credit Supply. Journal of Financial Intermediation 18, 125-150.

Huang, Hui; Shi Xiaojun and Shunming Zhang. 2011. Counter-Cyclical Substitution between Trade Credit and Bank Credit. Journal of Banking and Finance Forthcoming, .

Jiménez, G., Ongena, S., Peydró, J.L., and Saurina, J., 2010. Credit Supply: Identifying Balance-Sheet Channels with Loan Applications and Granted Loans, Discussion Paper 7655, CEPR.

Kashyap, Anil K. and Jeremy C. Stein. 2000. What do a Million Observationson Banks Say about the Transmission of Monetary Policy? American Economic Review 90, 407-428.

Mateut, Simona. 2005. Trade Credit and Monetary Policy Transmission. Journal of Economic Surveys 19, 655-670.

Mateut, Simona; Spiros Bougheas and Paul Mizen. 2006. Trade Credit, Bank Lending and Monetary Policy Transmission. European Economic Review 50, 603-629.

Nielsen, Jeffrey H. 2002. Trade Credit and the Bank Lending Channel. Journal of Money, Credit, and Banking 34, 226-253.

Ogura, Yoshiaki. 2012. Lending Competition and Credit Availability for New Firms: Empirical Study with the Price Cost Margin in Regional Loan Markets. Journal of Banking & Finance 36, 1822-1838.

Ogura, Yoshiaki. 2010. Interbank Competition and Information Production: Evidence from the Interest Rate Difference. Journal of Financial Intermediation 19, 279-304.

Oliner, Stephen D. and Glenn D. Rudebusch. 1996a. Is there a Broad Credit Channel for Monetary Policy? FRBSF Economic Review 1, 3-13.

Oliner, Stephen D. and Glenn D. Rudebusch. 1996b. Monetary Policy and Credit Conditions: Evidence from the Composition of External Finance: Comment. American Economic Review 86, 300-309.

Oliner, Stephen D. and Glenn D. Rudebusch. 1995. Is there a Bank Lending Channel for Monetary Policy? Economic Review-Federal Reserve Bank of San Francisco 2, 3-20.

Petersen, Mitchell A. and Raghuram G. Rajan. 1995. The Effect of Credit Market Competition on Lending Relationships. Quarterly Journal of Economics. 110, 407-443.

Presbitero, Andrea F. and Alberto Zazzaro. 2011. Competition and Relationship Lending: Friends Or Foes? Journal of Financial Intermediation 20, 387-413.

Scott, Jonathan A. and William C. Dunkelberg. 2010. Competition for Small Firms Banking Business: Bank Actions Versus Market Structure. Journal of Banking and Finance 34, 2788-2800.

Scott, Jonathan A. and William C. Dunkelberg. 2003. Bank Mergers and Small Firm Financing. Journal of Money, Credit and Banking 35, 999-1017.

Tsuruta, Daisuke. 2010. How does Small Businesses Finance their Growth Opportunities? the Case of Recovery from the Lost Decade in Japan.

Tsuruta, Daisuke. 2007. Credit Contagion and Trade Credit Supply: Evidence from Small Business Data in Japan.

Uesugi, Iichiro and Guy M. Yamashiro. 2008. How Trade Credit Differs from Loans: Evidence from Japanese Trading Companies.

Wu, Wenfeng; Oliver M. Rui and Chongfeng Wu, forthcoming. Trade Credit, Cash Holdings, and Financial Deepening: Evidence from a Transitional Economy. Journal of Banking & Finance.

Zarutskie, Rebecca. 2006. Evidence on the Effects on Bank Competition on Firms Borrowing and Investment. Journal of Financial Economics 81, 503-537.

Annex:
Introduction and conclusions in Spanish

INTRODUCCIÓN

1. Introducción

La presente tesis doctoral incluye tres artículos de investigación en el área de banca y finanzas corporativas. El objetivo de esta tesis doctoral es triple. La primera pregunta de investigación trata de resolver si el poder de mercado bancario constituye una cuestión relevante que influya sobre la disponibilidad de crédito bancario y, por tanto si este hecho tuviera repercusión sobre la inversión empresarial, y subsecuentemente sobre el crecimiento económico. El segundo ensayo pregunta si las restricciones financieras de la empresa, así como la gestión de liquidez, son factores determinantes sobre la actividad exportadora de la empresa. Finalmente, el tercer ensayo trata sobre el papel que desempeña la política monetaria sobre el tipo de interés implícito y el volumen de crédito comercial entre empresas. Con la intención de profundizar en los temas de investigación presentados anteriormente, se ofrece un breve resumen de la situación actual, como marco general de análisis, sobre la literatura económica que engloba el poder de mercado bancario, disponibilidad de crédito bancario, política monetaria, crédito comercial y exportaciones.

1.1. La importancia del estudio de la estructura del mercado bancario y las finanzas corporativas

La literatura financiera ha reconocido que la estructura del mercado bancario ha desempeñado un papel fundamental para encontrar una adaptación adecuada en la relación entre empresas y bancos, y por tanto conseguir fondos suficientes para llevar a cabo las consiguientes inversiones en activos fijos. En esta línea, la investigación reciente ha estado centrada fundamentalmente en el estudio de la incidencia que la

concentración del mercado bancario ejerce sobre la relación entre empresas y bancos, prestamistas y prestatarios, y por tanto sobre la disponibilidad de crédito. Uno de los objetivos de esta tesis doctoral es dar un paso más para extender la literatura económica sobre economía industrial, y buscar una relación más directa entre el poder de mercado bancario y la inversión empresarial.

Recientemente, algunas artículos han puesto a prueba la importancia de la organización del mercado bancario como un factor relevante para la disponibilidad de crédito, en particular para las pequeñas y medianas empresas (en adelante PYMES) (véase Berger y Udell, 1998, 2002; Uchida *et al*., 2006), y por tanto un factor determinante para el acceso a la financiación empresarial, o incluso sobre otras formas de financiación como por ejemplo el crédito comercial (véase Fisman y Love, 2003; Fisman y Raturi, 2004; Petersen y Rajan, 1997). Otros trabajos también han demostrado que la causalidad entre la estructura del mercado bancario y la disponibilidad de crédito está estrechamente relacionada con las rentas de información (véase Ogura, 2010, 2012; Petersen y Rajan, 1995).

En esta tesis doctoral, se discuten varios puntos de vista que sugieren que una posición competitiva más fuerte podría ser beneficiosa para la financiación empresarial, aunque por otro lado, existen otros argumentos que abogan que una reducción de la competencia bancaria reduce la disponibilidad de financiación para las empresas (véase Berger y Udell, 2002; Berger y Black, 2011; Boot y Thakor, 2000; Carbó *et al.*, 2009; Cetorelli y Gambera, 2001; Cetorelli, 2004; Elsas, 2005; Ogura, 2010, 2012; Sapienza, 2002; Scott y Dunkelberg, 2003, 2010; Zarutskie, 2006)[1]. En este sentido, Coccorese (2008) demuestra que la consolidación bancaria y la expansión económica tienden a reducir la concentración en favor de la competencia. Agostino y Trivieri (2008, 2010)

---

[1] Berger *et al.* (2004) ofrece una visión extensa sobre los efectos que ejerce la concentración de mercado bancario sobre la financiación de empresas, en particular para el caso de la financiación de las PYMES, así como la futura agenda de investigación.

encuentran causalidad negativa, para el caso italiano, entre la concentración bancaria y el acceso de las empresas a la financiación bancaria, mientras que Scott y Dunkelberg (2010) demuestran que la competencia bancaria impulsa la disponibilidad de financiación bancaria y no bancaria. Canales y Nanda (en prensa) analizan los efectos de la desregulación bancaria y la competencia sobre el volumen y el tipo de interés del crédito bancario ofrecido a las empresas. Los autores demuestran que los bancos descentralizados tienden a facilitar mayor volumen de crédito a las empresas, en paticular a las PYMES, incrementando la actividad empresarial, así como atienden a unos plazos de crédito más favorables. Aunque las instituciones financieras estén capacitadas para ofrecer unos plazos más atractivos, éstas están en mejor posición para seleccionar las empresas más solventes y reducir el crédito en zonas donde tienen un mayor poder de mercado.[2]

La agenda de investigación se ha expandido para incluir también el análisis de la estructura de mercado bancario, la competencia y la concentración sobre las relaciones banca-empresa, en particular haciendo mayor hincapié sobre el crédito relacional. Estrechamente relacionado con esta tesis doctoral, la literatura financiera ofrece argumentos sólidos para demostrar que el poder de mercado bancario puede percibirse como una herramienta para extraer información de los prestatarios (véase Ogura, 2010, 2012). El trabajo seminal presentado por Petersen y Rajan (1995, 2002) concluye que un mejor acceso a la información no está condicionado necesariamente por la información dura sobre la solvencia de los prestatarios, puesto que este hecho permite a los bancos prestar considerando una mayor distancia con respecto de las empresas sin comprometer su habilidad de suscribir o monitorizar estos créditos. Petersen y Rajan

---

[2] Estrechamente relacionado con este artículo, Erel (2011) demuestra que después de procesos de fusión, el solapamiento del mercado incrementa los costes de los ahorros, y por tanto reduce los márgenes, pero cuando el solapamiento es suficientemente amplio, los márgenes pudieran incrementarse también por los efectos del poder de mercado.

(1994, 1995) proveen el marco teórico que determina que la competencia en los mercados de crédito y las relaciones a largo plazo no son obligatoriamente compatibles, y los bancos son menos capaces de retener a los prestatarios, así como un incremento del poder de mercado bancario tiene una influencia positiva sobre la disponibilidad de crédito, puesto que los prestamistas son capaces de capturar una mayor cuota de los excedentes de los tipos de interés de los créditos futuros de los prestatarios. [3] Dell'Ariccia (2000) demuestra que los efectos de la competencia bancaria sobre el cribado puede resultar algo ambigua reflejándose en un dilema del prisionero en el cual los bancos deciden entre el crédito relacional o transaccional. Boot (2000) y Boot y Thakor (2000) demuestran la existencia de beneficios que cada banco gana invirtiendo en conocimiento es decreciente a medida que la renta de incrementa, por ello la renta por unidad de crédito relacional disminuye. Siguiendo este razonamiento, la literatura financiera ha continuado la agenda de investigación demostrando que el valor de la estructura del mercado bancario y el crédito relacional es también extensible al número de relaciones que cada empresa posee con sus instituciones financieras (véase Carbó *et al*., 2012a, Degryse y Ongena, 2001; Kano *et al*., 2011). Degryse *et al.* (2011) encuentra que la rentabilidad es mayor si la empresa conserva sólo una única relación con el banco. Carbó *et al*. (2012a) demuestra que relaciones más intensas en toda su longitud y un menor número de bancos crean mayor disponibilidad de crédito, y reduce la probabilidad de restricciones financieras para la empresa, mientras que Kano *et al.* (2011), basado en datos para Japón, encuentra evidencia de que relaciones más largas

---

[3] Esta rama de la literatura financiera ha motivado numerosos estudios sobre la importancia del impacto de la distancia banco-prestatario sobre la disponibilidad de crédito, precio del crédito y sobre el resultado de la relación prestatario-prestamista (véase Agarwal y Hauswald, 2006, 2010; Berger y De Young, 2006; Brevoort y Hannan, 2006; De Young *et al.*, 2008, 2011; Degryse y Ongena, 2001, 2005; Uchida *et al*., 2012).

son beneficiosas para los prestatarios y bancos pequeños en cuanto a que este hecho puede reducir el coste del crédito bancario, así como incrementar su disponibilidad.[4]

Siguiendo esta línea de análisis, la rama de la literatura financiera más reciente encuentra evidencia de la existencia de un efecto de U-invertida entre la concentración de mercado bancario y las relaciones banca-empresas (véase Degryse y Ongena, 2007; Elsas, 2005; Ogura, 2010, 2012; Ongena *et al.*, 2012; Presbitero y Zazzaro, 2011). En este sentido, Elsas (2005) ha demostrado que una alta concentración en el mercado de créditos reduce la probabilidad de que el banco asuma la función de banco principal o *Hausbank*. Degryse y Ongena (2007) encuentran un efecto no monótono de la concentración de mercado, el cual es robusto para controlar por la presencia de mercados de crédito locales de bancos con múltiples contactos. Presbitero y Zazzaro (2011) extienden su análisis sugiriendo que esta relación no monótona puede explicarse atendiendo al nivel de organización de los mercados locales. Además, los autores proveen evidencia de que un incremento marginal en la competencia bancaria va en detrimento del crédito relacional en mercados en los que el *Hausbank* es la entidad dominante. En esta línea, Ongena *et al*. (2012) demuestran que el crédito bancario suele estar concentrado en un *Hausbank* que juega un importante papel que determina la concentración de acreedores. Ogura (2010, 2012), utilizando el margen entre el precio y el coste marginal (*mark-up* como se conoce en la literatura anglosajona) como medida de poder de mercado, demuestra que poder de mercado bancario mejora la disponibilidad de crédito bancario, en particular para las PYMES, aunque en una segunda etapa de la investigación, provee evidencia indirecta de que el poder de marcado bancario sea probablemente generado por el crédito relacional.

---

[4] Véase también Goddard y Wilson (2009) y Goddard *et al*. (2007, 2011) para una visión global.

La totalidad de los argumentos presentados anteriormente demuestran que la competencia en los mercados bancarios es un factor relevante para determinar las relaciones entre bancos y empresas, así como la disponibilidad de crédito y los términos en que se ofrece dicho crédito. La principal pregunta de investigación formulada en el primer ensayo es si el poder de mercado bancario, y la consiguiente disponibilidad de crédito, puede ser un factor determinante para decidir la inversión empresarial en activos fijos en el corto y largo plazo. Se encuentran argumentos en la literatura financiera que demuestran que la concentración en el mercado bancario ejerce cierta influencia sobre la creación de empresas y la inversión (véase Black y Strahan, 2002; Cetorelli, 2004; Cetorelli y Gambera, 2001; Cetorelli y Strahan, 2006; Degryse *et al*., 2011; Bonaccorsi di Patti y Dell'Ariccia, 2004; Bonaccorsi di Patti y Gobbi, 2007; Zarutskie, 2006). Los resultados presentados en el primer ensayo demuestran que el poder de mercado bancario ejerce una influencia negativa sobre la inversión empresarial, aunque se recupera en el largo plazo. En consonancia con nuestros resultados, Black y Strahan (2002) demuestran que la concentración del mercado bancario reduce la creación de nuevas empresas. Además, Bonaccorsi di Patti y Dell'Ariccia (2004) encuentran evidencia de que la competencia bancaria puede resultar menos favorable para el nacimiento de nuevas empresas en sectores industriales donde las asimetrías de información sean más importantes. Este argumento es consistente con modelos teóricos previos que consideran explícitamente la asimetría de información entre prestamistas y prestatarios, y predicen que la competencia bancaria puede reducir las disponibilidad de crédito para las empresas informacionalmente más opacas. Rice y Strahan (2010) demuestran que las empresas en ambientes más competitivos reciben con mayor probabilidad crédito bancario a menor precio. Del mismo modo, Cetorelli (2004) encuentra evidencia de que cambios en la mejora de la competencia del

mercado lleva a eliminar barreras financieras para las nuevas empresas, así como podría ayudar a incrementar la dimensión de la empresas en términos de valor añadido o empleo. Estrechamente relacionado con el primer ensayo, Bonaccorsi di Patti y Dell'Ariccia (2004) demuestran que las empresas prestatarias de bancos involucrados en procesos de fusiones y adquisiciones tienen una mayor tasa de inversión después de la fusión. Este resultado ha sido criticado por Degryse *et al*. (2011) puesto que Bonaccorsi di Patty y Dell'Ariccia (2004) fallan en encontrar grandes efectos para las empresas más dependientes de los bancos. Por otro lado, Zarutskie (2006) encuentra evidencia de que en ambientes competitivos las empresas más jóvenes invierten menos, sugiriendo que la competencia incrementa las restricciones financieras de las empresas, disminuyendo los efectos a largo plazo.

1.2. Los efectos de las restricciones financieras sobre la gestión de liquidez y el comercio internacional

La crisis financiera ha supuesto un colapso en el comercio internacional desde agosto de 2008 hasta abril de 2009. En este sentido, un grupo de artículos han comprobado la coincidencia entre el gran colapso comercial y la crisis financiera global mostrando que la reducción del crédito bancario está estrechamente relacionado con la caída del comercio internacional (véase Ahn *et al*., 2011; Alessandria *et al.*, 2010, 2011; Bems *et al.*, 2011; Bricogne *et al.*, 2012; Chor y Manova, 2012; Levchenko *et al*., 2011; Manova, 2010; Manova et al., 2011, entre otros). En esta línea, considerando el lado del consumidor, la economía global ha experimentado también un descenso severo de la demanda que ha afectado claramente al comercio internacional (véase Manova, 2010). Basado en este razonamiento, el segundo capítulo de esta tesis doctoral propone si las

restricciones financieras pueden ser un obstáculo para convertir la empresa en exportadora o incluso reducir el volumen de ventas al exterior si la empresa ya lo era.

Algunos autores reconocen la importancia de las restricciones financieras sobre el volumen de exportaciones, en particular en lo relacionado con la crisis bancaria. Además, el impacto de la crisis bancaria sobre las exportaciones constituye una cuestión especialmente relevante para los investigadores y por tanto, la literatura económica ha identificado al menos dos razones sobre porqué las empresas exportadoras difieren unas de otras en el impacto del crecimiento de la producción (véase Aimiti y Weinstein, 2011; Bricogne *et al.*, 2012; Chor y Manova, 2012; Iacovone y Zavacka, 2009; Park *et al.*, 2010, entre otros). En primer lugar, los inversores nacionales pueden considerar como un signo de eficiencia y competitividad operar en los mercados internacionales, por tanto, en un contexto de imperfecciones de los mercados financieros, exportar puede interpretarse como una señal de solvencia frente a financiación externa (véase Bernard y Jensen, 1995, 1999, 2004; Iacovone y Zavacka, 2009). Este argumento lo refuerzan Campa y Shaver (2002) que demuestran que la inversión es menos sensible al *cash flow* por grupos de exportadores comparado con el grupo de no exportadores, lo que significa que exportar puede ayudar a las empresas a reducir restricciones financieras. Greenaway y Kneller (2004, 2007) y Greenaway *et al*. (2005, 2007) no encuentran evidencia en favor de la hipótesis de que las empresas con menores restricciones financieras se autoseleccionen para actividades exportadoras. En este sentido, el argumento de que las restricciones financieras afecten a las empresas exportadoras más que a las no exportadoras gana relevancia, incluso después de considerar los efectos de la crisis bancaria (véase Aimiti y Weinstein, 2011; Bellone *et al*., 2010; Bricogne *et al*., 2012; Chor y Manova, 2012; Greenaway y Kneller, 2007; Greenaway et al., 2007; Manova, 2010; Manova *et al*., 2011). Algunos trabajos recientes han demostrado evidencia

similar a la presentada en el segundo ensayo de esta tesis doctoral. Bellone *et al*. (2010) emplea como medida de restricción financiera un índice de puntuación basado en medidas indirectas relacionadas con determinadas características de la empresa como por ejemplo el ratio de liquidez. En esta misma línea, Bricogne *et al*. (2012) identifica las empresas financieramente restringidas si alguna de ellas ha experimentado un impago en alguno de los créditos en años previos. El incidente en el pago puede considerarse como generador de restricciones financieras puesto que puede tener un impacto negativo y significativo sobre el volumen de nuevo crédito. Los autores muestran que el impacto de los incidentes en los pagos durante la crisis ejerce una influencia negativa sobre el volumen de las exportaciones de las empresas, comparado con las exportaciones del mismo grupo de empresas antes de la crisis. Hasta donde llega nuestro conocimiento, el punto de encuentro de los estudios previos es el uso de medidas indirectas de las restricciones financieras. El segundo ensayo emplea datos de encuesta para obtener evidencia si la empresa está restringida financieramente o no. Más precisamente, usamos la base de datos *Business Environment and Enterprise Performance Survey* (BEEPS en adelante) en su versión de 2009, que pregunta al empresario si el último crédito solicitado fue siempre aprobado, en ocasiones aprobado o denegado, o siempre denegado, entre otras cuestiones interesantes sobre las razones explicativas de porqué el crédito ha sido denegado, así como las garantías que respaldan el crédito.[5] Con intención de contrastar la robustez de los resultados obtenidos a partir de la encuesta, se construye también un modelo de desequilibrio a partir de estimaciones paramétricas basado en Ogawa y Suzuki (2000), Atanasova y Wilson (2004), Atanasova (2007), Shikimi (2005), y Carbó *et al*. (2009).

---

[5] Se consideran las siguientes tres preguntas (traducidas del inglés):
q47a: *Si su empresa no tiene actualmente un crédito, ¿cuál es la razón?*
q47b: *Si su empresa no ha solicitado un crédito, ¿cuáles fueron las principales razones?*
q47c: *Si la solicitud de su empresa fue rechazada, ¿cuáles fueron las principales razones?*

La segunda razón es que exportar se asocia con la necesidad de financiación externa debido a que las empresas deben financiar costes hundidos y fijos vinculados a la incursión en los mercados exteriores, hacer inversiones específicas, investigación de mercados, adaptación regulatoria, e incluso establecer y mantener su cartera de clientes (véase Albornoz, en prensa). Adicionalmente, esta razón justifica que los exportadores debieran también buscar financiar el capital circulante con relación a las ventas al exterior antes que las operaciones nacionales (véase Bricogne *et al*., 2012; Chor y Manova, 2012; Manova *et al*., 2011; Manova, 2010; Djankov *et al*., 2010). Para resolver los problemas de liquidez, las empresas suelen confiar en la financiación bancaria o en el crédito documentario. Por lo tanto, la segunda parte de nuestra investigación esta motivada por la relación existente entre las actividades exportadoras de la empresa y la gestión de liquidez. En resumen, nuestra atención se enfoca tanto en la financiación interna y externa de las operaciones de tráfico de la empresa. Varios autores has relacionado las restricciones financieras con la necesidad de liquidez. El artículo seminal presentado por Fazzari *et al*. (1988) y Fazzari y Petersen (1993) demuestra que las restricciones financieras se relacionan con sensibilidades del *cash flow*. Este argumento está relacionado con aquellos presentados por Kaplan y Zingales (1997, 2000) que sugieren que una sensibilidad del *cash flow* elevada no puede interpretarse como evidencia de que la empresa esté financieramente restringida, incluyendo en su muestra 49 empresas de bajos dividendos como criterio de restricciones financieras, y Cleary (1999, 2006) demuestra que la sensibilidad del cash flow no identifica necesariamente empresas con restricciones de liquidez. En particular, también encontramos autores que establecen que mantener ciertos niveles de liquidez es determinante especialmente cuando los mercados de capital son imperfectos (véase Blanchard *et al*., 1994; Kim *et al*., 1998; Lins *et al*., 2010; Yun, 2009). Estrechamente

relacionado con el segundo ensayo de esta tesis, Bigelli y Sánchez-Vidal (2012) demuestran que las empresas con mayor ciclo de conversión de efectivo (*cash conversion cycle*, por su denominación en inglés) y menores déficits financieros, mantienen también mayor nivel de caja, como predice la *hierarchy theory*. Los autores predicen evidencia de que los pagos de dividendos se asocian con mayor tenencia de tesorería, y la deuda bancaria y el capital circulante neto representan buenos sustitutos de tesorería.[6] Las empresas financieramente restringidas también consumieron efectivo, y confiaron más intensamente en las líneas de crédito de los bancos temerosos de que restringirían el acceso al crédito en el futuro, así como vendieron más activos para financiar sus operaciones (véase Campello *et al*., 2010). Chor y Manova (2012) demuestran que las condiciones del crédito juegan un papel determinante como canal a través del cual la crisis económica afecta a los volúmenes comerciales, así como a las exportaciones de las empresas financieramente más vulnerables que son más sensibles al coste del capital externo que a las exportaciones de las industrias menos vulnerables. Esta historia motiva la segunda cuestión presentada en el segundo ensayo de esta tesis doctoral: ¿podría la gestión de liquidez constituir un factor determinante de las empresas exportadoras?

1.3. La importancia del volumen y el tipo de interés del crédito comercial

Una vez tratada la importancia de la disponibilidad de crédito bancario y la inversión empresarial en activos fijos y capital circulante, el tercer ensayo trata sobre la influencia que ejerce los movimientos de los tipos de interés macroeconómicos sobre el tipo de interés implícito del crédito comercial y la posición del balance de la empresa, es decir si la empresa está más interesada en ser prestatario neto de crédito comercial o por

---

[6] Véase Faulkender y Wang (2006) y Pinkowitz *et al*. (2006).

el contrario, prestamista neto. La literatura financiera ha expuesto que la investigación sobre crédito comercial constituye una cuestión interesante, en particular en tiempos de crisis, debido a que retrasos en los pagos, o incluso su falta de disponibilidad, puede constituir una vía de contagio entre empresas, así como suponer un incremento de la presión financiera que afecta a las decisiones de inversión (véase Carbó *et al.*, 2012b). El crédito comercial permite a los vendedores posponer el pago a clientes dependiendo de las necesidades de estos últimos y, por otro lado, los clientes son capaces de operar sin restricciones de liquidez (véase Raddatz, 2006, 2010; Braun y Raddatz, 2008), aunque también se encuentran autores que demuestran que el crédito comercial puede ser una forma cara de financiación para la empresa (véase Carbó *et al.*, 2012b; Ng *et al.*, 1999).

La literatura sobre política monetaria ha estado interesada tradicionalmente en estudiar canal de tipos de interés (*interest rate channel* por su denominación en la literatura anglosajona) el cual se enfoca en el análisis de los movimientos en los tipos de interés macroeconómicos basados en el ajuste de los objetivos o *targets* de los bancos centrales sobre el mercado de bonos nacionales. Estos cambios se transmiten al sector real de la economía y son los responsables de los efectos de la transmisión de los *shocks* sobre la economía real (véase Clauss, 2011). Esta visión se ha extendido hacia el papel jugado por las imperfecciones de los mercados en la transmisión de la política monetaria a través del canal de crédito (véase Romer y Romer, 1990, 1994; Hubbard, 1998). La existencia de asimetrías de información tienen como consecuencia que no puedan usarse formas alternativas de financiación como sustitutivos perfectos y el coste, así como su disponibilidad, dependa del propio balance de la empresa (véase Mateut, 2005; Mateut *et al.*, 2006). En este sentido, el enfoque del canal de crédito bancario (*bank lending channel*, por su denominación en la literatura anglosajona) propuesto por

Bernanke y Blinder (1988) sugiere que los bancos desempeñan un papel especial en el sistema financiero debido a que tienen una ventaja especial en procesar asimetrías de información (véase Bernanke y Blinder, 1992; Bernanke y Gertler, 1995; Kashyap y Stein, 2000). En este sentido, Stein (1998) desarrolla un modelo en el que los problemas de información dificultan a los bancos obtener financiación. La principal implicación del canal de crédito bancario para la financiación y la inversión de la empresa está relacionada con que cambios en la política monetaria podría tener un impacto significativo sobre las empresas más dependientes del crédito bancario (véase Kashyap y Stein, 2000). Por otro lado, Kashyap *et al*. (1993) demuestran que una contracción de la política monetaria conlleva una alteración en la combinación de la financiación externa de la empresa: el papel comercial se incrementa en detrimento del crédito bancario, y por tanto este hecho reduce la disponibilidad de crédito bancario. Carbó y López (2009) demuestran, para datos de empresas españolas, que en la medida en que los tipos de interés se incrementan, las empresas reducen su dependencia de los bancos, así como incrementan los recursos líquidos. Huang (2003) y Huang *et al*. (2011) señalan que el comportamiento dinámico de la deuda bancaria frente a la deuda no-bancaria demuestra que el canal de crédito bancario opera a través de reducción de la oferta del crédito a las empresas más pequeñas, las cuales sufren más que las grandes empresas debido a que las primeras no tienen más alternativas que la financiación bancaria, de acuerdo con el comportamiento del inventario.

A medida que el canal de crédito bancario pierde importancia, el canal de balance (*balance sheet channel* por su denominanción en la literatura anglosajona) de Bernanke y Gertler (1995) gana progresivamente relevancia. El canal de balance surge de la presencia de problemas de asimetría de información en los mercados de crédito. Importantes contribuciones teóricas (véase Diamond, 1984, 1991; Hoshi *et al*., 1990,

1991; Bolton y Freixas, 2000; Repullo y Suarez, 2000) demuestran que las imperfecciones de los mercados de capital condicionan el acceso de las empresas con posición financiera más débil. Estos modelos predicen que en periodos de contracción monetaria las empresas financieramente más débiles tienen mayores dificultades de acceso al crédito bancario. Bernanke y Gertler (1989, 1995) exponen que las contracciones de la política monetaria perjudican la solvencia de la empresa, y como consecuencia la habilidad de la empresa para obtener fondos de los bancos, o incluso a través de otros intermediarios financieros. Siguiendo a la contracción monetaria, el crédito a las PYMES se ve reducido con respecto del crédito a las grandes empresas.[7] Ashcraft (2006) y Ashcraft y Campello (2007) investigan si la solvencia de los prestatarios influye sobre la respuesta del crédito bancario a la política monetaria. Estos resultados son consistentes con el mecanismo de transmisión a través de la demanda que opera a través del balance de la empresa y es independiente del canal del crédito bancario (*bank lending channel*). Bougheas *et al*. (2006, 2009) encuentran evidencia empírica de que las empresas más pequeñas, más jóvenes y de mayor riesgo están afectadas más significativamente por las condiciones derivadas de la contracción monetaria. No obstante, la rama más reciente de la literatura empírica se enfoca sobre la reciente crisis financiera demostrando que el canal de crédito bancario opera a través del riesgo bancario. En esta línea, Altunbas *et al*. (2012) demuestran que las instituciones con mayor exposición al riesgo cuentan con menos capital, mayor dimensión, mayor confianza en los fondos de mercado a corto plazo, así como un crecimiento del crédito relativamente agresivo. Altunbas *et al*. (2010) demuestra que el riesgo bancario desempeña un papel importante para determinar la oferta de crédito de los bancos y protegerlos de una contracción monetaria, en cuanto a que tienen un mejor acceso a la

---

[7] Véase Black y Rosen (2007) que demuestran que en periodos de contracción monetaria los bancos ajustan su volumen de crédito reduciendo los plazos de los créditos y redistribuyendo la oferta de crédito a corto plazo desde las empresas pequeñas a las grandes.

recaudación de fondos. En particular, la titulización utilizada antes de la crisis financiera ha contribuido ampliamente a modificar el canal de crédito bancario, así como la habilidad de los bancos para conceder créditos como argumentan Altunbas *et al*. (2009). Los autores aseguran que el uso de las actividades de titulización también reducen la efectividad de las política monetaria. Además, los bancos que hacen un uso masivo de la titulización tienden a conceder mayor volumen de crédito, y este efecto es más pronunciado cuando la economía se encuentra en buen estado.

Estrechamente relacionado con el tercer ensayo de esta tesis doctoral, el canal del crédito comercial (*trade credit channel* por su denominación en la literatura anglosajona) puede verse como otro sustituto del canal de crédito bancario. Encontramos argumentos sólidos en la literatura financiera que abogan que durante una contracción monetaria las empresas pequeñas, así como las grandes aunque con menor nivel de activos colateralizables, tienden a incrementar el uso del crédito comercial (véase Nielsen, 2002). Del mismo modo, Guariglia y Mateut (2006) y Mateut *et al*. (2006) demuestran, utilizando datos para el Reino Unido, que las empresas utilizan simultáneamente el canal de crédito bancario y el canal del crédito comercial durante contracciones monetarias, aunque este último canal tiende a debilitar el primero, mientras que Choi y Kim (2005) encuentran un incremento significativo del uso de los acreedores comerciales y los deudores comerciales o créditos por ventas durante contracciones monetarias. Estos resultados se encuentran en línea con los presentados en esta tesis doctoral. Una de las contribuciones del tercer ensayo es que durante contracciones de la política monetaria las empresas incrementan el uso del crédito comercial en detrimento del débito comercial, lo que significa que las empresas tienden a convertirse en prestatario comercial neto en lugar de prestamista. Adicionalmente, Atanasova y Wilson (2003, 2004) demuestran que la demanda de crédito bancario de las

empresas disminuye durante periodos de contracción monetaria, mientras que la oferta de crédito también lo hace.[8] Sin embargo, los resultados ofrecidos en el tercer ensayo muestran que una contracción de la política monetaria lleva a acercar la financiación bancaria y el crédito comercial, al menos cuando se analiza el efecto complementario. Se encuentra evidencia empírica de que en periodos en los que la política monetaria se contrae, el crédito bancario y el crédito comercial pueden ser formas complementarias de financiación empresarial. Del mismo modo, se halla en la literatura financiera otros autores que defienden la complementariedad entre la disponibilidad de crédito bancario y crédito comercial cuando las instituciones financieras imponen las restricciones financieras (véase Petersen y Rajan, 1994, 1995, 1997; Danielson y Scott, 2004; Burkart y Ellingsen, 2004; Cull *et al*., 2009; Giannetti *et al*., 2011). Carbó *et al*. (2012b) encuentra una sensibilidad significativa de la extensión del crédito comercial al crédito bancario a nivel de empresas sin restricciones financieras, lo cual les sugiere el papel de prestamistas debido a su acceso más fácil a la financiación bancaria. Love and Zaidi (2010) no encuentran evidencia de que el crédito bancario sea sustituto del crédito comercial en tiempos de crisis económica. Por otro lado, también se encuentran argumentos en favor de la sustituibilidad entre el crédito bancario y el crédito comercial. En este sentido, De Blasio (2005) y Fukuda *et al*. (2006) encuentran evidencias de que el crédito bancario y el crédito comercial podrían ser sustitutivos en tiempos de contracción monetaria. Estos resultados son consistentes con aquellos presentados por Tsuruta (2007, 2010) que demuestra que los proveedores reducen el volumen de crédito comercial en tiempos de crisis, y Uesugi y Yamashiro (2008) demuestran que el crédito comercial y el crédito bancario difieren sustancialmente en términos de acreedores, y entre instrumentos de crédito.

---

[8] Ramey (1992) extiende la teoría de King y Ploser (1984) al reconocer que, bajo ciertas condiciones, movimientos conjuntos de la política monetaria y el crédito comercial revelan la existencia de shocks financieros subyacentes para la mayoría de fluctuaciones de dinero en los ciclos económicos.

No obstante, estamos también interesados en estudiar la existencia del efecto de la competencia (*competition effect*) entre el crédito bancario y el crédito comercial. Se establece un nuevo indicador computado como la diferencia entre el tipo de interés implícito soportado por cada empresa menos el tipo de interés implícito medio a nivel del sector al que la empresa pertenece. Se demuestra que una contracción de la política monetaria tiende a crear divergencias entre los diferentes tipos de interés implícitos soportados por cada empresa dentro del mismo sector. Este efecto puede ser el resultado de un encarecimiento del crédito comercial.

2. Contribución de los ensayos

La revisión presentada anteriormente sirve como introducción de los ensayos presentados en esta tesis doctoral. La próxima sección presenta un breve resumen de las principales contribuciones de cada capítulo.

2.1. Ensayo I: Poder de mercado bancario e inversión empresarial a corto y largo plazo

Este artículo investiga los efectos del poder de mercado bancario sobre la tasa de inversión de la empresa considerando el corto y largo plazo. Hasta donde sabemos, este es el primer trabajo que propone que la estructura del mercado bancario puede influir sobre las decisiones de inversión de la empresa. Se construye una novedosa base de datos en la que se combinan información a nivel de empresa de la base de datos SABI (2010) publicada por Bureau van Dijk, y datos a nivel bancario procedentes de los estados financieros para bancos comerciales reportados por la Asociación Española de Banca (AEB), la Confederación Española de Cajas de Ahorros (CECA) para las cajas de

ahorros, y la Unión Nacional de Cooperativas de Crédito (UNACC) para las cooperativas de crédito.

La contribución de este artículo el cuádruple: (i) el poder de mercado bancario ejerce una influencia negativa sobre la inversión de la empresa a corto plazo; (ii) los efectos del poder de mercado bancario son mayores en el corto plazo que en el largo plazo, aunque la tasa de inversión se recupera a largo plazo. Los resultados son robustos cuando se utilizan variables alternativas de inversión como el crecimiento de los activos de la empresa o el ratio inversión sobre activos, o incluso si se sustituye el índice de Lerner por medidas de concentración del mercado de crédito; (iii) también se realiza el contraste de causalidad de Granger para demostrar la existencia de causalidad directa en una sola dirección entre en poder de mercado bancario y la inversión de la empresa. Se encuentra evidencia de que el poder de mercado bancario influye sobre la inversión empresaria, pero no en la dirección contraria; y finalmente, (iv) también se demuestra la existencia de sensibilidad del *cash flow* sobre la tasa de inversión considerando un ambiente de poder de mercado bancario, en particular, se encuentra evidencia para las PYMES más que para las grandes empresas, lo que significa que el poder de mercado bancario convierte a las PYMES en más conservadoras en el corto plazo, aunque ese efecto puede relajarse.

2.2. Ensayo II: Exportaciones, gestión de liquidez, y restricciones financieras

El objetivo de este artículo es doble. Por un lado, estamos interesados en estudiar la relación entre la falta de disponibilidad de crédito sobre las condiciones de exportaciones de la empresa, así como el porcentaje de volumen de ventas que la empresa designa a sus clientes en el exterior, es decir, en el margen intensivo. Del

mismo modo, trata de determinarse si la gestión de liquidez de la empresa, medida como el intervalo de tiempo que la empresa gestiona su capital circulante, se representa por dos índices: el ciclo de conversión de efectivo y el ciclo neto comercial (*net trade cycle*, por su denominación en la literatura anglosajona) en un facto influyente en las exportaciones de la empresa.

La base de datos utilizada en este ensayo se obtiene de la versión de 2009 de la *Business Environment and Enterprise Performance Survey* (BEEPS) desarrollada conjuntamente por el Banco Mundial y el Banco Europeo para la Reconstrucción y el Desarrollo. Se incluyen en la muestra 3.354 empresas de Grecia, Alemania, Portugal, y España. Se incluye en el cuestionario también información relacionada con el balance de situación y la cuenta de resultados de la empresa, así como los productos y servicios financieros que la empresa utiliza para financiarse, como por ejemplo cuentas corrientes, uso de tarjetas de crédito y de débito, o líneas de crédito. Adicionalmente, la encuesta incluye un amplio conjunto de preguntas relacionadas con información relacionada con el acceso a los mercados externos de capital y restricciones financieras.

La contribución de este ensayo es doble: (i) se descubre que las restricciones de crédito constituye un obstáculo por el lado de las condiciones de exportación, es decir, en el margen extensivo, y en el volumen de ventas asignado a exportaciones, es decir, en el margen intensivo. Estos resultados se obtienen empleando un criterio doble de restricción financiera. Por un lado, se construye una variable dicotómica a partir de las respuestas del cuestionario que representa si la empresa se encuentra financieramente restringida, o no. Se contrasta la robustez de los resultados estimando un modelo de desequilibrio, y además, se encuentra que existe un fuerte poder explicativo comparando ambas metodologías. (ii) Con relación a la gestión de liquidez, los resultados también sugieren que la gestión de liquidez constituye un factor relevante

para las empresas con intención de comenzar a exportar. Del mismo modo, se encuentra evidencia de que ciclos de crédito comercial más largos incrementan la probabilidad de ser exportador y, asimismo, también se incrementa el volumen de ventas al extranjero. Más aún, estamos también interesados en profundizar en el estudio de las causas que dirigen el ciclo de conversión de efectivo, por tanto se hace hincapié en los diferentes componentes de los indicadores y se concluye que el periodo de cobro (*collection period*) y el periodo de inventario (*inventory period*) está influido positivamente por las exportaciones, mientras que por otro lado, el periodo de crédito (*credit period*) muestra un efecto inverso.

2.3. Ensayo III: Política monetaria, tipo de interés implícito, y crédito comercial relativo neto

La investigación sobre el crédito comercial constituye una importante cuestión puesto que cobra especial relevancia en tiempos de crisis ya que retrasos en los pagos o impagos, o incluso su falta de disponibilidad supone un incremento en la presión financiera para las empresas que afectan a sus decisiones de inversión. La literatura económica se ha enfocado tradicionalmente en el estudio de los efectos de la política monetaria sobre los tipos de interés bancarios y la disponibilidad de crédito, incluso considerando el canal del crédito comercial (*trade credit channel*) como sustituto del canal de crédito bancario (*bank lending channel*). Por tanto, en este trabajo se proponen las siguientes dos preguntas de investigación: (i) ¿Pueden transmitirse las decisiones en política monetaria a los tipos de interés implícitos del crédito comercial?, y (ii) ¿tiene repercusión la subida de tipos de interés en las empresas para convertirse en prestatario o prestamista comercial neto?

La contribución de este ensayo es asimismo doble: (i) se construye una nueva medida para aproximar el tipo de interés implícito del crédito comercial considerando los gastos financieros de la empresa detraído los gastos de tipo de interés pagados por otras por otras formas de financiación. Los resultados muestran que una contracción de la política monetaria se traduce en un encarecimiento del crédito comercial como recurso de financiación. (ii) Adicionalmente, se investiga el efecto que tiene una contracción de la política monetaria sobre el comportamiento de la empresa con respecto del crédito comercial. De este modo, se construye un nuevo ratio con intención de medir la ponderación relativa media del crédito (o del débito) comercial en los activos corrientes de la empresa: el crédito comercial relativo. Hasta donde llega nuestro conocimiento, este es el primer trabajo que emplea una medida relativa para definir el índice dentro de un rango homogéneo. Por tanto, este nuevo índice puede considerarse también como una contribución a la metodología, puesto que este ratio se computa normalizando por el volumen total de financiación de las operaciones comerciales, lo que ayuda a mitigar el problema de la comparabilidad entre empresas. Enfocados en los resultados empíricos, se descubre que un incremento en los tipos de interés conlleva a sesgar el balance de la empresa hacia el lado del crédito comercial, es decir las empresas tienden a convertirse en prestatarios comerciales. (iii) Examinando los efectos que la política monetaria tiene sobre el efecto competencia (*competition effect*), se descubre que un incremento en los tipos de interés conlleva un incremento en la distancia entre el tipo de interés implícito (del crédito comercial) y el tipo de interés medio para el sector industrial al que la empresa pertenece. Y finalmente, (iv) con respecto del efecto complementario (*complementarity effect*), se demuestra que se reduce el diferencial entre el tipo de interés implícito y el coste de la financiación bancaria a medida que la política monetaria se incrementa. Estos resultados sugieren que existe un efecto

complementario entre el crédito comercial y el coste de la financiación bancaria en un ambiente de tipos de interés al alza.

Referencias
(Anexo: Introducción)

Agarwal, Sumit and Robert Hauswald. 2010. Distance and Private Information in Lending. Review of Financial Studies 23, 2757-2788.

Agarwal, Sumit and Robert Hauswald. 2006. Distance and Information Asymmetries in Lending Decisions. Mimeo.

Agostino, Mariarosaria and Francesco Trivieri. 2010. Is Banking Competition Beneficial to SME? an Empirical Study Based on Italian Data. Small Business Economics 35, 335-355.

Agostino, Mariarosaria and Francesco Trivieri. 2008. Banking Competition and SMEs Bank Financing. Evidence from Italian Provinces. Journal of Industrial Competition and Trade 8, 33-53.

Ahn, JaeBin; Mary Amiti and David E. Weinstein. 2011. Trade Finance and the Great Trade Collapse. American Economic Review 101, 298-302.

Albornoz, Facundo; Héctor F. Calvo Pardo; Gregory Corcos and Emanuel Ornelas, en prensa. Sequential Exporting. Journal of International Economics.

Alessandria, George; Joseph P. Kaboski and Virgiliu Midrigan. 2011. US Trade and Inventory Dynamics. American Economic Review 101, 303-307.

Alessandria, George; Joseph P. Kaboski and Virgiliu Midrigan. 2010. The Great Trade Collapse of 2008-09: An Inventory Adjustment? IMF Economic Review 58, 254-294.

Altunbas, Yener; Leonardo Gambacorta and David Marques-Ibanez. 2010. Bank Risk and Monetary Policy. Journal of Financial Stability 6, 121-129.

Altunbas, Yener; Leonardo Gambacorta and David Marques-Ibanez. 2009. Securitisation and the Bank Lending Channel. European Economic Review 53, 996-1009.

Altunbas, Yener; Simone Manganelli and David Marques-Ibanez. 2012. Bank Risk During the Financial Crisis: Do Business Models Matter? Bangor Business School. Working Paper BBSWP/12/003.

Amiti, Mary and David E. Weinstein. 2011. Exports and Financial Shocks. The Quarterly Journal of Economics 126, 1841-1877.

Ashcraft, Adam B. 2006. New Evidence on the Lending Channel. Journal of Money, Credit, and Banking 38, 751-775.

Ashcraft, Adam B. and Murillo Campello. 2007. Firm Balance Sheets and Monetary Policy Transmission. Journal of Monetary Economics 54, 1515-1528.

Atanasova, Christina V. 2007. Access to Institutional Finance and the use of Trade Credit. Financial Management 36, 49-67.

Atanasova, Christina V. and Nicholas Wilson. 2004. Disequilibrium in the UK Corporate Loan Market. Journal of Banking and Finance 28, 595-614.

Atanasova, Christina V. and Nicholas Wilson. 2003. Borrowing Constraints and the Demand for Trade Credit: Evidence from UK Panel Data. Managerial and Decision Economics 24, 503-514.

Bellone, Flora; Patrick Musso; Lionel Nesta and Stefano Schiavo. 2010. Financial Constraints and Firm Export Behaviour. World Economy 33, 347-373.

Bems, Rudolfs; Robert C. Johnson and Kei-Mu Yi. 2011. Vertical Linkages and the Collapse of Global Trade. American Economic Review 101, 308-312.

Berger, Allen N. 1995. The Profit-Structure Relationship in Banking . Test for Market-Power and Efficient Structure Hypotheses. Journal of Money, Credit, and Banking 27, 404-431.

Berger, Allen N. and Lamont K. Black. 2011. Bank Size, Lending Technologies, and Small Business Finance. Journal of Banking and Finance 35, .

Berger, Allen N. and Robert De Young. 2006. Technological Progress and the Geographic Expansion of Commercial Banks. Journal of Money, Credit and Banking 38, 1483-1513.

Berger, Allen N. and Gregory F. Udell. 2002. Small Business Credit Availability and Relationship Lending: The Importance of Bank Organisatinal Structure. Economic Journal 112, 32-53.

Berger, Allen N. and Gregory F. Udell. 1998. The Economics of Small Business Finance: The Role of Private Equity and Debt Markets in the Financial Growth Cycle. Journal of Banking and Finance 22, 613-673.

Berger, Allen N.; Asli Demirgüç-Kunt; Ross Levine and Joseph G. Haubrich. 2004. Bank Concentration and Competition: An Evolution in the Making. Journal of Money, Credit and Banking. 36, 433-451.

Bernanke, Ben S. and Alan S. Blinder. 1992. The Federal Funds Rate and the Channels of Monetary Transmission. American Economic Review 82, 901-921.

Bernanke, Ben S. and Alan S. Blinder. 1988. Credit, Money, and Aggregate Demand. American Economic Review 78, 435-439.

Bernanke, Ben S. and Mark Gertler. 1995. Inside the Black Box: The Credit Channel of Monetary Policy Transmission. Journal of Economic Perspectives 9, 27-48.

Bernanke, Ben S. and Mark Gertler. 1989. Agency Cost, Net Worth, and Business Fluctuations. American Economic Review 79, 14-31.

Bernard, Andrew B. and J. Bradford Jensen. 2004. Why some Firms Export. Review of Economics and Statistics 86, 561-569.

Bernard, Andrew B. and J. Bradford Jensen. 1999. Exceptional Exporters Performance: Cause, Effect, Or both? Journal of International Economics 47, 1-25.

Bernard, Andrew B. and J. Bradford Jensen. 1995. Exporters, Jobs, and Wages in US Manufacturing: 1976-1987. Booking Papers on Economic Activity, Microeconomics 67-119.

Bigelli, Marco and Javier Sánchez-Vidal. 2012. Cash Holdings in Private Firms. Journal of Banking & Finance 36, 26-35.

Black, Lamont K. and Richard J. Rosen. 2007. How the Credit Channel Works: Differentiating the Bank Lending Channel and the Balance Sheet Channel.

Black, Sandra E. and Philip E. Strahan. 2002. Entrepeneurship and Black Credit Availability. Journal of Finance 57, 2807-2833.

Blanchard, Olivier J.; Florencio Lopez-de-Silanes and Andrei Shleifer. 1994. What do Firms do with Cash Windfalls? Journal of Financial Economics 36, 337-360.

Bolton, Patrick and Xabier Freixas. 2000. Equity, Bonds, and Bank Debt: Capital Structure and Financial Market Equilibrium Under Asymmetric Information. Journal of Political Economy 108, 324-351.

Bonaccorsi di Patti, Emilia and Giovanni Dell'Ariccia. 2004. Bank Competition and Firm Creation. Journal of Money, Credit and Banking 36, 225-251.

Bonaccorsi di Patti, Emilia and Giorgio Gobbi. 2007. Winners or Losers? The Effects of Banking Consolidation on Corporate Borrowers. The Journal of Finance 62, 669-695.

Boot, Arnoud W. A. 2000. Relationship Banking: What do we Know? Journal of Financial Intermediation 9, 7-25.

Boot, Arnoud W. A. and Anjan V. Thakor. 2000. Can Relationship Banking Survive Competition? Journal of Finance 55, 679-713.

Bougheas, Spiros; Simona Mateut and Paul Mizen. 2009. Corporate Trade Credit and Inventories: New Evidence of a Trade-Off from Accounts Payable and Receivable. Journal of Banking and Finance 33, 300-307.

Bougheas, Spiros; Paul Mizen and Cihan Yalcin. 2006. Access to External Finance: Theory and Evidence on the Impact of Monetary Policy and Firm-Specific Charasteristics. Journal of Banking and Finance 30, 199-227.

Braun, Matias and Claudio Raddatz. 2008. Politics of Financial Development: Evidence from Trade Liberalization. Journal of Finance 63, 1469-1508.

Brevoort, Kenneth P. and Timothy H. Hannan. 2006. Commercial Lending and Distance: Evidence from Community Reinvestment Act Data. Journal of Money, Credit, and Banking 38, 1991-2012.

Bricongne, Jean-Charles; Lionel Fontagné; Guillaume Gaulier; Daria Taglioni and Vincent Vicard. 2012. Firms and the Global Crisis: French Exports in the Turmoil. Journal of International Economics 87, 134-146.

Burkart, Mike and Tore Ellingsen. 2004. In-Kind Finance: A Theory of Trade Credit. American Economic Review 94, 569-590.

Campa, José Manuel and J. Myles Shaver. 2002. Exporting and Capital Investment: On the Strategic Behavior of Exporters. Research Paper No. 469.

Campello, Murillo; John R. Graham and Campbell R. Harvey. 2010. The Real Effects of Financial Cosntraints: Evidence from a Financial Crisis. Journal of Financial Economics 97, 470-487.

Canales, Rodrigo and Ramana Nanda. en prensa. A Darker Side to Decentralized Banks: Market Power and Credit Rationing in SME Lending. Journal of Financial Economics.

Carbó, Santiago and Rafael López. 2009. Bank-Lending Channel and Non-Financial Firms: Evidence for Spain. Spanish Economic Review 11, 125-140.

Carbó, Santiago; Hans Degryse and Francisco Rodriguez. 2012a. Lending Relationships and Credit Rationing: The Impact of Securitization. Mimeo.

Carbó, Santiago; Francisco Rodriguez and Gregory F. Udell. 2012b. Trade credit, the financial crisis and firms' access to finance. Mimeo.

Carbó, Santiago; Francisco Rodriguez and Gregory F. Udell. 2009. Bank Market Power and SME Financing Constraints. Review of Finance 13, 309-340.

Cetorelli, Nicola. 2004. Real Effects of Bank Competition. Journal of Money, Credit and Banking 36, 543-558.

Cetorelli, Nicola and Philip E. Strahan. 2006. Finance as a Barrier to Entry: Bank Competition and Industry Structure in Local U.S. Markets. Journal of Finance. 61, 437-461.

Cetorelli, Nicola and Michele Gambera. 2001. Banking Market Structure, Financial Dependence and Growth: International Evidence from Industry Data. Journal of Finance 56, 617-648.

Choi, Woon Gyu and Yungsan Kim. 2005. Trade Credit and the Effect of Monetary Macro-Financial Shocks: Evidence from U.S. Panel Data. Journal of Financial and Quantitative Analysis 40, 897-925.

Chor, Davin and Kalina Manova. 2012. Off the Cliff and Back? Credit Conditions and International Trade during the Global Financial Crisis. Journal of International Economics 87, 117-133.

Clauss, Iris. 2011. Inside the Black Box: How Important is the Credit Channel Relative to the Interest and Exchange Rate Channels? Economic Modelling 28, 1-12.

Cleary, Sean. 2006. International Corporate Investment and the Relationship between Financial Constraint Measures. Journal of Banking and Finance 30, 1559-1580.

Cleary, Sean. 1999. Relationship between Firm Investment and Financial Status. Journal of Finance 54, 673-692.

Coccorese, Paolo. 2008. An Investigation on the Causal Relationship between Banking Concentration and Economic Growth. International Review of Financial Analysis 17, 557-570.

Cull, Robert; Lixin Collin Xu and Tian Zhu. 2009. Formal Finance and Trade Credit during China's Transition. Journal of Financial Intermediation 18, 173-192.

Danielson, Morris G. and Jonathan A. Scott. 2004. Bank Loan Availability and Trade Credit Demand. Financial Review 39, 579-600.

De Blasio, Guido. 2005. Does Trade Credit Substitute for Bank Credit? Evidence from Firm-Level Data. Economic Notes 34, 85-112.

De Young, Robert; Dennis Glennon and Peter Nigro. 2008. Borrower-Lender Distance, Credit Scoring, and Loan Performance: Evidence from International-Opaque Small Business Borrowers. Journal of Financial Intermediation. 17, 113-143.

De Young, Robert; W. S. Frame; Dennis Glennon and Peter Nigro. 2011. The Information Revolution and Small Business Lending: The Missing Evidence. Journal of Financial Services Research 1-2, 19-33.

Degryse, Hans and Steven Ongena. 2007. The Impact of Competition on Bank Orientation. Journal of Financial Intermediation 16, 399-424.

Degryse, Hans and Steven Ongena. 2005. Distance, Lending Relationships, and Competition. Journal of Finance 60, 231-266.

Degryse, Hans and Steven Ongena. 2001. Bank Relationships and Firm Profitability. Financial Management 30, 9-34.

Degryse, Hans; Nancy Masschelein and Janet Mitchell. 2011. Staying, Dropping, Or Switching: The Impacts of Bank Mergers on Small Firms. Review of Financial Studies 24, 1102-1140.

Dell'Ariccia, Giovanni. 2000. Learning by Lending, Competition and Screening Incentives in the Banking Industry. Center for Financial Institutions Working Paper 00-10.

Diamond, Douglass W. 1991. Monitoring and Reputation: The Choice between Bank Loans and Directly Placed Debt. Journal of Political Economy 99, 689-721.

Diamond, Douglass W. 1984. Financial Intermediation and Delegated Monitoring. Review of Economic Studies 51, 393-414.

Elsas, Ralf. 2005. Empirical Determinants of Relationship Lending. Journal of Financial Intermediation 14, 32-57.

Erel, Isil. 2011. The Effect of Bank Mergers on Loan Prices: Evidence from the United States. Review of Financial Studies 24, 1068-1101.

Faulkender, Michael and Rong Wang. 2006. Corporate Financial Policy and the Value of Cash. Journal of Finance 61, 1957-1990.

Fazzari, Steven M. and Bruce C. Petersen. 1993. Working Capital and Fixed Investment: New Evidence on Financing Constraints. RAND Journal of Economics 24, 328-342.

Fazzari, Steven M.; R. Glenn Hubbard and Bruce C. Petersen. 1988. Financing Constraints and Corporate Investment. Brooking Papers on Economic Activity. 1, 141-206.

Fisman, Raimond and Inessa Love. 2003. Trade Credit, Financial Intermediary Development, and Industry Growth. Journal of Finance. 58, 353-374.

Fisman, Raymond and Mayank Raturi. 2004. Does Competition Encourage Credit Provision? Evidence from African Trade Credit Relationships. Review of Economics and Statistics 86, 345-352.

Fukuda, Shin-ichi; Munehisa Kayusa and Kentaro Akashi. 2006. The Role of Trade Credit for Small Firms: An Implication for Japan's Banking Crisis. Center for Advanced Research in Finance, University of Tokyo CARF-F-078.

Giannetti, Mariassunta; Mike Burkart and Tore Ellingsen. 2011. What You Sell is what You Lend? Explaining Trade Credit Contracts. Review of Financial Studies 24, 1261-1298.

Goddard, John and John O. S. Wilson. 2009. Competition in Banking: A Disequilibrium Approach. Journal of Banking & Finance 33, 2282-2292.

Goddard, John; Hong Liu; Philip Molyneux and John O. S. Wilson. 2011. The Persistence of Bank Profit. Journal of Banking & Finance 35, 2881-2890.

Goddard, John; Philip Molyneux; John O. S. Wilson and Manouche Tavakoli. 2007. European Banking: An Overview. Journal of Banking and Finance. 31, 1911-1935.

Greenaway, David and Richard Kneller. 2007. Industry Differences in the Effect of Export Market Entry: Learning by Exporting? Review of World Economics 143, 416-432.

Greenaway, David and Richard Kneller. 2004. Exporting and Productivity in the United Kingdom. Oxford Review of Economic Policy 20, 358-371.

Greenaway; David; Alessandra Guariglia and Kneller Richard. 2007. Financial Factors and Exporting Decisions. Journal of International Economics 73, 377-395.

Greenaway, David; Joakim Gullstrand and Richard Kneller. 2005. Exporting may no always Boost Firm Productivity. Review of World Economic 141, 561-582.

Guariglia, Alessandra and Simona Mateut. 2006. Credit Channel, Trade Credit Channel, and Inventory Investment: Evidence from a Panel of UK Firms. Journal of Banking and Finance 30, 2835-2856.

Hoshi, Takeo; Anil Kashyap and David Scharftein. 1991. Corporate Structure, Liquidity, and Investment: Evidence from Japanese Industrial Groups. Quarterly Journal of Economics 106, 33-60.

Hoshi, Takeo; Anil Kashyap and David Scharftein. 1990. The Role of Banks in Reducing the Cost of Financial Distress in Japan. Journal of Financial Economics 27, 67-88.

Huang, Hui; Shi Xiaojun and Shunming Zhang. 2011. Counter-Cyclical Substitution between Trade Credit and Bank Credit. Journal of Banking and Finance 35, 1859-1878.

Huang, Zhangkai. 2003. Evidence of a Bank Lending Channel in the UK. Journal of Banking and Finance 27, 491-510.

Hubbard, R. Glenn. 1998. Capital-Market Imperfections and Investment. Journal of Economic Literature 36, 193-225.

Iacovone, Leonardo and Veronica Zavacka. 2009. Banking Crises and Exports. Lessons from the Past. The Word Bank Policy Research Working Paper 5016.

Kano, Masaji; Hirofumi Uchida; Gregory F. Udell and Wako Watanabe. 2011. Information Verifiability, Bank Organization, Bank Competition and Bank-Borrower Relationships. Journal of Banking and Finance 35, 935-954.

Kaplan, Steven N. and Luigi Zingales. 2000. Investment-Cash Flow Sensitivities are Not Valid Measures of Financing Constraints. Quarterly Journal of Economics 115, 707-712.

Kaplan, Steven N. and Luigi Zingales. 1997. Do Investment-Cash Flow Sensivities Provide Useful Measures of Financing Constraint? The Quarterly Journal of Economics. 112, 169-215.

Kashyap, Anil K. and Jeremy C. Stein. 2000. What do a Million Observations Banks Say about the Transmission of Monetary Policy? American Economic Review 90, 407-428.

Kashyap, Anil K.; Jeremy C. Stein and David W. Wilcox. 1993. Monetary Policy and Credit Conditions: Evidence from the Composition of External Finance. American Economic Review 83, 78-98.

Kim, C. S.; D. Mauer and A. Sherman. 1998. The Deteminants of Corporate Liquidity: Theory and Evidence. Journal of Financial and Quantitative Analysis 33, 335-359.

King, Robert G. and Charles I. Plosser. 1984. Money, Credit, and Prices in a Real Business Cycle. American Economic Review 74, 363-380.

Levchenko, Andrei A.; Logan T. Lewis and Linda L. Tesar. 2011. The "Collapse in Quality" Hypothesis. American Economic Review 101, 293-297.

Lins, Karl V.; Henri Servaes and Peter Tufano. 2010. What Drives Corporate Liquidity? an International Survey of Cash Holdings and Line of Credit. Journal of Financial Economics 98, 160-176.

Love, Inessa and Rida Zaidi. 2010. Trade Credit, Bank Credit, and Financial Crisis. International Review of Finance 10, 125-147.

Manova, Kalina. 2010. Credit Constraints, Heterogeneous Firms, and International Trade. NBER Working Paper 14531.

Manova, Kalina; Shang-Jin Wei and Zhiwei Zhan. 2011. Firm Exports and Multinational Activity under Credit Constraints. NBER Working Paper 16905.

Mateut, Simona. 2005. Trade Credit and Monetary Policy Transmission. Journal of Economic Surveys 19, 655-670.

Mateut, Simona; Spiros Bougheas and Paul Mizen. 2006. Trade Credit, Bank Lending and Monetary Policy Transmission. European Economic Review 50, 603-629.

Ng, Chee K.; Janet Kiholm Smith and Richard L. Smith. 1999. Evidence on the Determinants of Credit Terms used in Interfirm Trade. Journal of Finance 54, 1109-1129.

Nilsen, Jeffrey H. 2002. Trade Credit and Bank Lending Channel. Journal of Money, Credit, and Banking 34, 226-253.

Ogawa, K. and K. Suzuki. 2000. Uncertainty and Investment: Some Evidence from the Panel Data of Japanese Manufacturing Firms. Japanese Economic Review 51, 170-192.

Ogura, Yoshiaki. 2012. Lending Competition and Credit Availability for New Firms: Empirical Study with the Price Cost Margin in Regional Loan Markets. Journal of Banking & Finance 36, 1822-1838.

Ogura, Yoshiaki. 2010. Interbank Competition and Information Production: Evidence from the Interest Rate Difference. Journal of Financial Intermediation 19, 279-304.

Ongena, Steven; Günseli Tümer-Alkan and Natalja v. Westernhagen. 2012. Creditor Concentration: An Empirical Investigation. European Economic Review 56, 830-847.

Park, Albert; Dean Yang; Xinzheng Shi and Yuan Jiang. 2010. Exporting and Firm Performance: Chinese Exporters and the Asian Financial Crisis. The review of economics and statistics 92, 822-842.

Petersen, Mitchell A. and Raghuram G. Rajan. 2002. Does Distance Still Matters? the Information Revolution in Small Business Lending. Journal of Finance 57, 2533-2570.

Petersen, Mitchell A. and Raghuram G. Rajan. 1997. Trade Credit: Theories and Evidence. Review of Financial Economics. 10, 226-253.

Petersen, Mitchell A. and Raghuram G. Rajan. 1995. The Effect of Credit Market Competition on Lending Relationships. Quarterly Journal of Economics. 110, 407-443.

Petersen, Mitchell A. and Raghuram G. Rajan. 1994. The Benefits of Lending Relationships: Evidence from Small Business Data. Journal of Finance. 49, 3-37.

Pinkowitz, L.; R. Stulz and R. Williamson. 2006. Does the Contribution of Corporate Cash Holdings and Dividends to Firms Value Dependent to Firms Value Depend on Governance? A Cross-Country Analysis. Journal of Finance 61, 2725-2751.

Presbitero, Andrea F. and Alberto Zazzaro. 2011. Competition and Relationship Lending: Friends Or Foes? Journal of Financial Intermediation 20, 387-413.

Raddatz, Claudio. 2010. Credit Chains and Sectoral Comovement: Does the Use of Trade Credit Amplify Sectoral Shocks? The Review of Economics and Statistics 92, 985-1003.

Raddatz, Claudio. 2006. Liquidity Needs and Vulnerability to Financial Underdevelopment. Journal of Financial Economics 80, 677-722.

Ramey, Valerie A. 1992. The Source of Financial Fluctuations in Money: Evidence from Trade Credit. Journal of Monetary Economics 30, 171-193.

Repullo, Rafael and Javier Suarez. 2000. Entrepeneurial Moral Hazard and Bank Monitoring: A Model of the Credit Channel. European Economic Review 44, 1931-1950.

Rice, Tara and Phillip E. Strahan. 2010. Does Credit Competition Affect Small-Firm Finance? Journal of Finance 65, 861-889.

Romer, Christina D. and David H. Romer. 1994. Monetary Policy Matters. Journal of Monetary Economics 34, 75-88.

Romer, Christina D. and David H. Romer. 1990. New Evidence on the Monetary Transmission Mechanism. Brookings Papers on Economic Activity 1, 149-213.

Sapienza, Paola. 2002. The Effects of Banking Mergers on Loan Contracts. Journal of Finance 57, 329-367.

Scott, Jonathan A. and William C. Dunkelberg. 2010. Competition for Small Firms Banking Business: Bank Actions Versus Market Structure. Journal of Banking and Finance 34, 2788-2800.

Scott, Jonathan A. and William C. Dunkelberg. 2003. Bank Mergers and Small Firm Financing. Journal of Money, Credit and Banking 35, 999-1017.

Shikimi, Masayo. 2005. Do Firms Benefit from Multiple Banking Relationships? Evidence from Small and Medium-Sized Firms in Japan. Discussion Papers Series No. 70.

Simeon Djankov; Caroline Freund and Cong S. Pham. 2010. Trading on Time. The Review of Economics and Statistics 92, 166-173.

Stein, Jeremy C. 1998. An Adverse-Selection Model of Bank Asset and Liability Management with Implication for the Transmission of Monetary Policy. RAND Journal of Economics 29, 466-486.

Tsuruta, Daisuke. 2010. How does Small Businesses Finance their Growth Opportunities? the Case of Recovery from the Lost Decade in Japan.

Tsuruta, Daisuke. 2007. Credit Contagion and Trade Credit Supply: Evidence from Small Business Data in Japan.

Uchida, Hirofumi; Gregory F. Udell and Wako Watanabe. 2006. Are Trade Creditors Relationship Lenders? RIETI Discussion Papers 06026.

Uchida, Hirofumi; Gregory F. Udell and Nobuyoshi Yamori. 2012. Loan Officers and Relationship Lending to SMEs. Journal of Financial Intermediation 21, 97-122.

Uesugi, Iichiro and Guy M. Yamashiro. 2008. How Trade Credit Differs from Loans: Evidence from Japanese Trading Companies. RIETI Discussion Papers 04028.

Yun, Hayong. 2009. The Choice of Corporate Liquidity and Corporate Governance. Review of Financial Studies 22, 1447-1475.

Zarutskie, Rebecca. 2006. Evidence on the Effects on Bank Competititon on Firms Borrowing and Investment. Journal of Financial Economics 81, 503-537.

CONCLUSIONES

1. Resumen de las conclusiones

Los tres ensayos presentados en esta tesis doctoral constituyen una contribución a la literatura sobre la relación entre la estructura del mercado bancario e inversión empresarial, política monetaria, crédito comercial y exportaciones. Como resumen general, en esta sección se ofrece un breve sumario de las principales conclusiones presentadas en esta tesis doctoral:

a) El primer ensayo de esta tesis doctoral está motivado por la rama reciente de la literatura económica que defiende que la disponibilidad de crédito constituye uno de las más relevantes cuestiones para impulsar la financiación empresarial (véase Berger y Udell, 1998, 2002, 2006). Estas dificultades se manifiestan en el acceso a la financiación externa reflejada en el grado de información asimétrica, la cual puede estar seguida por restricciones financieras que dificultan el crecimiento de la empresa, o incluso el cierre de la misma (véase Canales y Nanda, en prensa). Recientemente, un grupo de trabajos han demostrado que la disponibilidad del crédito bancario y la concentración del crédito bancario están estrechamente relacionados con la creación de rentas de información (véase Ogura, 2010, 2012; Petersen y Rajan, 1995), mientras que otros estudios han descubierto relación positiva con el crédito relacional por invertir en ciertos recursos específicos para las empresas (véase Berger, 1995; Boot y Thakor, 2000; Carbó *et al*., 2009; Degryse y Ongena, 2007; Elsas, 2005; Scott y Dunkelberg, 2003, 2010; Presbitero y Zazzaro, 2011).

Motivado por los argumentos expuestos anteriormente, en esta tesis doctoral se han contrastado las principales implicaciones del poder de mercado bancario sobre la tasa de inversión de la empresa desde una perspectiva dinámica. De las dos principales

contribuciones del primer trabajo, una de ellas sugiere que poder de mercado bancario ejerce un efecto negativo sobre la tasa de inversión de la empresa a corto plazo. Este resultado se encuentra en línea con la literatura previa que defiende que la concentración del mercado bancario perjudica el crecimiento de la empresa o incluso la creación de nuevas empresas (véase Black y Strahan, 2002; Bonaccorsi de Patti y Dell'Ariccia, 2004; Bonaccorsi di Patti y Gobbi, 2007; Cetorelli y Gambera, 2001; Cetorelli, 2004; Cetorelli y Strahan, 2006; Degryse *et al.*, 2011; Zarutskie, 2006). Este ensayo pretende dar un paso adelante estimando los efectos del poder de mercado bancario a largo plazo y sugiere que la tasa de inversión empresarial se recupera. Este resultado puede interpretarse a través de la relación banco-empresa, la cual se mejora durante periodos subsecuentes, y por tanto la financiación bancaria se recupera también a largo plazo (véase Ogura, 2010, 2012). En línea con nuestros resultados, Bonaccorsi de Patti y Gobbi (2007), que también relacionan el crédito de las empresas emitido por los bancos envueltos en procesos de fusiones y adquisiciones, demuestran que un incremento en la tasa de inversión empresarial a largo plazo de las empresas cuyos bancos se encuentran inmersos en procesos de fusiones y adquisiciones.

Adicionalmente, realizamos el contraste de causalidad de Granger para determinar la dirección entre el poder de mercado bancario y la tasa de inversión empresarial. Los resultados sugieren que el poder de mercado bancario es un hecho determinante para la tasa de inversión empresarial, aunque no se encuentra evidencia en sentido opuesto. La robustez de los resultados se demuestra si se sustituye el índice de Lerner por otras medidas de concentración bancaria como los índices HHI y C5. Finalmente, también se desarrolla el análisis de sensibilidad entre el *cash flow* y la inversión (*cash-flow sensitivity analysis*, por su denominación en la literatura anglosajona), así como los efectos que el poder de mercado bancario ejerce sobre los

fondos internos de la empresa. Los resultados confirman que el poder de mercado bancario es sensible al *cash flow* y a la inversión reduciendo el impacto del *cash flow* a largo plazo (véase Bonaccorsi di Patti y Gobbi, 2007).

b) La disponibilidad de crédito bancario no afecta sólo a la inversión empresarial en activos fijos como se ha expuesto anteriormente, sino que también tiene repercusiones importantes sobre la inversión en activos corrientes, y por tanto sobre la gestión de liquidez (véase Acharya *et al*., 2007; Almeida *et al*., 2004, 2011; Caglayan *et al*., 2012; Claessens *et al*., en prensa; Ding *et al*., en prensa), como se expone en el segundo ensayo de esta tesis doctoral. Del mismo modo, la literatura financiera reciente ha mostrado evidencia de que la falta de disponibilidad de crédito tiene consecuencias negativas para las exportaciones de la empresa debido a que la ésta necesita superar un cierto nivel de costes fijos con intención de penetrar en los mercados exteriores (véase Albornoz *et al*., en prensa). Adicionalmente, la literatura financiera también ha demostrado que la inversión en capital circulante puede utilizarse como una herramienta útil para aliviar las restricciones financieras a corto plazo (véase Ding *et al*., en prensa; Wu *et al*., en prensa). Estrechamente relacionado con este ensayo, Claessens *et al*., (en prensa) concluyen que la crisis financiera ha reducido la disponibilidad de capital circulante, y por tanto las ventas de la empresa también se ven reducidas, mientras que Caglayan *et al*. (2012) demuestran que la reducción de inversión en inventarios permite a las empresas mantener mayor nivel de activos líquidos o extender más crédito comercial con respecto al débito comercial recibido de los proveedores. En resumen, las restricciones financieras es un factor relevante para adaptar la cadena de producción a los *shocks* de demanda.

Motivado por los argumentos teóricos expuestos anteriormente, se ha analizado el comportamiento exportador de la empresa desde una doble perspectiva: por un lado,

considerando si la empresa es exportadora y, por otro lado, considerando el volumen de ventas de las empresas destinado a los mercados exteriores. Se demuestra que las restricciones financieras constituyen un obstáculo importante para acceder a los mercados exteriores, lo que significa que la falta de disponibilidad de crédito reduce la probabilidad de convertirse en empresa exportadora. Del mismo modo, las restricciones financieras también reducen el volumen de ventas al exterior de la empresa. Estos resultados están en línea con aquellos presentados por Bellone *et al*. (2010) y Bricongne *et al*. (2012), entre otros. La principal diferencia entre este trabajo y otros artículos reside en la metodología empleada, puesto que en este se emplean datos de encuesta con intención de obtener la opinión directamente de los empresarios sobre si la empresa se encuentra financieramente restringida, así como el grado de restricción financiera. No obstante, los resultados obtenidos son robustos si las restricciones financieras se estiman a través del modelo de desequilibrio.

Con respecto a los efectos de la gestión de liquidez sobre las exportaciones de las empresas, se demuestra que periodos más largos de capital circulante, medidos como el CCC y el NTC, llevan a la empresa a incrementar la probabilidad de orientar su actividad hacia el mercado exterior, así como a incrementar el volumen de ventas destinadas a la exportación sobre el las ventas totales de la empresa. Debido a que el CCC y el NTC son índices compuestos por la suma del periodo de cobro (*collection period*), periodo de inventarios (*inventory period*), menos el periodo de crédito (*credit period*), el análisis debe enfocarse también en el signo de cada indicador sobre los indicadores de exportación. Se halla que periodos de cobros más largos, así como para periodos de inventarios, incrementa la probabilidad de convertirse en empresa exportadora, así como también se incrementa el volumen de ventas de la empresa al exterior. Por otro lado, se demuestra que el periodo de crédito está negativamente

216

relacionado con la probabilidad de convertirse la empresa en exportadora, así como repercute negativamente también sobre el volumen de ventas al exterior.

c) El tercer ensayo de esta tesis doctoral se centra en el estudio del crédito comercial. La crisis financiera mundial ha supuesto una reducción en la financiación comercial. Esta cuestión gana relevancia, particularmente en tiempos de crisis, debido a que retrasos en los pagos, o incluso impagos o falta de disponibilidad, conlleva un incremento en la presión financiera para las empresas que afecta a sus decisiones de inversión (véase Carbó *et al*., 2012b). Se encuentran varios argumentos que defienden que la provisión de crédito comercial está estrechamente relacionada con la disponibilidad de crédito bancario. En este sentido, la literatura financiera está dividida sobre la cuestión de que el crédito comercial es complementario del crédito bancario, la llamada hipótesis de la complementariedad (*complementarity hypothesis*) (véase Burkart y Ellingsen, 2004; Carbó *et al*., 2012; Cull *et al*., 2009; Danielson y Scott, 2004; Giannetti *et al*., 2011, entre otros), y por otro lado, se hallan argumentos que sugieren que el crédito comercial y el crédito bancario son sustitutivos, la llamada hipótesis de sustitución (*substitution hypothesis*) (véase Fukuda *et al*., 2006; Huang *et al*., 2011; Tsuruta, 2007, 2010; Uesugi y Yamashiro, 2008, entre otros).

La literatura sobre política monetaria ha argumentado que una contracción de la política monetaria se transmite hacia un incremento del tipo de interés del crédito bancario, según la canal del tipo de interés (*interest rate channel*) (véase Clauss, 2011, entre otros). La literatura económica ha considerado también el papel de la banca en la distribución del crédito en consonancia con el estado de la política monetaria. El canal del crédito bancario (*bank lending channel*) propuesto por Bernanke y Blinder (1988) defiende que los bancos desempeñan un papel fundamental en el sistema financiero debido a que poseen importantes ventajas para resolver problemas de información

asimétrica. La literatura más reciente ha continuado excavando sobre esta visión sugiriendo que las principales implicaciones de este canal para el crédito y la inversión de la empresa es que la política monetaria ejerce un mayor impacto sobre las empresas más dependientes de la financiación bancaria (véase Kashyap y Stein, 2000) en particular para las más pequeñas (véase Carbó y López, 2009, Huang *et al*., 2011). La rama más reciente de la literatura financiera también considera el papel de la exposición al riesgo bancario para determinar la oferta de crédito para protegerlos de una contracción de la política monetaria. Los bancos con menor riesgo pueden resguardar mejor su crédito de una contracción monetaria en la medida que éstos tienen un mejor acceso a la recaudación de fondos (véase Altunbas *et al*., 2009, 2010, 2012). En este sentido, la visión del canal amplio (*broad channel view*, por su denominación en la literatura anglosajona) subraya que todas las formas de financiación externa son sustitutivos imperfectos de los fondos internos. Por tanto, estas asimetrías de información inducen una prima de los fondos externos como compensación del gasto esperado del coste de monitorización, y esta prima depende del estado de la política monetaria, la cual puede deteriorar el balance del prestatario y reducir las garantías subsidiarias (véase Oliner y Rudebusch, 1995, 1996a, 1996b). Con respecto de los fondos internos, la literatura sobre política monetaria también ha considerado que los *shocks* en la política monetaria se transmite sobre el volumen y la demanda del crédito comercial, según el canal del crédito comercial (*trade credit channel*) (véase Atanasova y Wilson, 2003, 2004; Guariglia y Mateut, 2006; Mateut, 2005; Mateut *et al*., 2006; Nielsen, 2002, entre otros). Según esta razonamiento, esta investigación se enfoca sobre la cuestión si los *shocks* en la política monetaria pueden transmitirse al tipo de interés (implícito) del crédito comercial.

Para responder a esta pregunta, se presentan dos medidas útiles para aproximar el precio del crédito comercial, el llamado tipo de interés implícito (IIR, por sus siglas en inglés), y la posición relativa de la financiación comercial dentro de un rango cerrado y, por tanto, haciendo la medida comparable entre empresas de diferente dimensión, llamado crédito comercial relativo neto (RNTC, por sus siglas en inglés). Los principales resultados confirman que una contracción de la política monetaria lleva a un incremento del coste del crédito comercial en línea con el canal del tipo de interés (*interest rate channel view*) (véase Clauss, 2011). Adicionalmente, como contraste de robustez, se utiliza el precio medio del crédito bancario (vía *credit channel*) cobre el coste del crédito comercial, obteniéndose resultados análogos (véase Carbó y López, 2009; Carbó *et al*., 2012b). A la luz de estos resultados, puede concluirse que así como las decisiones de incrementar los tipos de interés de referencia de la política monetaria se transmiten hacia un mayor coste de la financiación bancaria; y del mismo modo, hacia un aumento del coste del crédito comercial. Hasta donde llega nuestro conocimiento, este es el primer trabajo que analiza el efecto de la política monetaria sobre el coste del crédito comercial.

La política monetaria tiene también un importante efecto sobre el RNTC. Este trabajo demuestra también que una contracción de la política monetaria lleva a las empresas a convertirse en prestatarios comerciales netos. Estos resultados demuestran que a medida que se incrementan los tipos de interés macroeconómicos –o bancarios-, la provisión de crédito comercial por motivos financieros está presente, incluso más que los relacionados con motivos de transacción (véase Atanasova, 2007; Atanasova y Wilson, 2003, 2004; Carbó *et al*., 2012b, entre otros). Adicionalmente, se divide la muestra considerando la dimensión de la empresa. Se halla evidencia de que el impacto de la política monetaria es mayor para las grandes empresas, debido a que éstas pueden

pedir más prestado que las PYMES. Del mismo modo, se estudian los efectos de la crisis financiera sobre la posición de financiación comercial de la empresa. Los resultados demuestran que la crisis financiera ha invertido el proceso debido a que el corte en el crédito bancario lleva a las empresas a pedir prestado más crédito comercial, convirtiéndose en prestatarios comerciales (*trade borrowers*). Además, el efecto de la crisis financiera es mayor para las PYMES debido a que cuentan con mayor dependencia del crédito comercial mientras se encuentren más afectadas por las restricciones financieras derivadas de la contracción del crédito derivada de este evento (véase Carbó y López, 2009; Huang *et al.*, 2011; Kashyap y Stein, 2000).

Del mismo modo, esta investigación se profundiza hacia el estudio de la posición de la empresa frente a sus competidores a través del análisis de la distancia entre el IIR pagado por la empresa y el IIR medio para cada sector industrial al que la empresa pertenece (*competition effect*), así como la extensión de este análisis hacia el estudio de la complementariedad entre el crédito comercial y la financiación bancaria (*complementarity effect*). Con respecto del efecto de la competencia (*competition effect*), los resultados demuestran que una contracción en la política monetaria crean divergencias entre los diferentes IIR pagados por las empresas dentro de su sector. Este efecto puede ser resultado del incremento del coste del crédito comercial. Además, también se halla evidencia de que una contracción de la política monetaria reduce la distancia entre los precios de ambas formas de financiación. Este resultado es importante para la literatura financiera debido a que sostiene la hipótesis de la complementariedad (*complementarity hipothesis*) en un ambiente de contracción monetaria.

2. Futuras líneas de investigación

La principal conclusión de esta tesis doctoral es que la investigación en el área de banca y financiación de empresas no es todavía concluyente, en particular dentro del campo de la estructura de mercado bancario, las restricciones financieras, y el crédito comercial. En este sentido, queda investigación empírica todavía por realizar. La crisis financiera ha engendrado nuevos estudios sobre titulización bancaria como factor relevante para la provisión de crédito comercial, puesto que la literatura financiera ha demostrado que existe relación entre ambas formas de financiación.

La titulización de activos se ha convertido en una de las técnicas financieras más importantes para los bancos para crear liquidez, partiendo de créditos ilíquidos a largo plazo a instrumentos comerciales líquidos. Esta transformación es posible a través del uso de vehículos para fines especiales (*special purpose vehicles*, por su denominación en la literatura anglosajona) que consiste en una institución financiera separada del banco matriz. Esta técnica permite a los bancos transformar activos heterogéneos en títulos líquidos más homogéneos y adecuados para venderlos a terceros. El rango de activos sujetos a procesos de titulización es amplio e incluye, por ejemplo créditos hipotecarios, tarjetas de crédito y acreedores comerciales, bonos, préstamos para automóviles, y créditos para PYMES, entre otros. Durante la última década, España se ha establecido como uno de los países europeos más importantes en la emisión de activos bancarios titulizados. Aunque las titulizaciones fuera de balance han estado sujetas a regulación desde 1992, no fue hasta 1998 cuando se permite la titulización de todo tipo de activos (véase Cardone-Riportella *et al*., 2010).

El punto de partida de esta propuesta de investigación es el trabajo presentado por Carbó *et al*. (2012a) que demuestra que la banca relacional y la titulización reducen el racionamiento de crédito en periodos normales. Los autores demuestran que las

empresas implicadas en relaciones con los bancos envueltos en procesos de titulización de activos disfrutan de menores niveles de restricciones financieras en periodos normales, mientras que por otro lado, estas empresas reflejan restricciones financieras en tiempos de crisis. La literatura económica también demuestra como la titulización influye sobre la predisposición de los bancos a conceder crédito. De este modo, los derivados de crédito mejoran la liquidez de los bancos y pueden impulsar la provisión de crédito para las empresas (véase Drucker y Puri, 2009; Hirtle, 2009). La principal implicación de este resultado es que la titulización de activos puede mejorar el acceso de la empresa al crédito bancario a través del incremento de la liquidez. En este sentido, Jiménez *et al*. (2010) demuestran que los bancos con mejor posición de liquidez a través de la tutilización de activos, más precisamente, las empresas asociadas con bancos con una posición de capital o liquidez más débil cuentan con una probabilidad menor de obtener un crédito. Además, las restricciones en la oferta de crédito no pueden ser plenamente recuperadas, girando a otros bancos, girando a otros bancos que crean un efecto expulsión. Por tanto, el principal objetivo de esta investigación es demostrar la existencia de vínculos directos entre las actividades de titulización bancaria y el incremento del volumen del crédito comercial.

Referencias
(Anexo: Conclusiones):

Acharya, Viral V.; Heitor Almeida and Murillo Campello. 2007. Is Cash Negative Debt? A Hedging Perspective on Corporate Financial Policies. Journal of Financial Intermediation 16, 515-554.

Albornoz, Facundo; Héctor F. Calvo Pardo; Gregory Corcos and Emanuel Ornelas, en prensa. Sequential Exporting. Journal of International Economics.

Almeida, Heitor; Murillo Campello and Michael S. Weisbach. 2011. Corporate Financial and Investment Policies when Future Financing is Not Frictionless. Journal of Corporate Finance 17, 675-693.

Almeida, Heitor; Murillo Campello and Michael S. Weisbach. 2004. The Cash Flow Sensitivity of Cash. Journal of Finance 59, 1777-1804.

Altunbas, Yener; Leonardo Gambacorta and David Marques-Ibanez. 2010. Bank Risk and Monetary Policy. Journal of Financial Stability 6, 121-129.

Altunbas, Yener; Leonardo Gambacorta and David Marques-Ibanez. 2009. Securitisation and the Bank Lending Channel. European Economic Review 53, 996-1009.

Altunbas, Yener; Simone Manganelli and David Marques-Ibanez. 2012. Bangor Business School. Working Paper BBSWP/12/003.

Atanasova, Christina V. 2007. Access to Institutional Finance and the use of Trade Credit. Financial Management 36, 49-67.

Atanasova, Christina V. and Nicholas Wilson. 2004. Disequilibrium in the UK Corporate Loan Market. Journal of Banking and Finance 28, 595-614.

Atanasova, Christina V. and Nicholas Wilson. 2003. Bank Borrowing Constraints and the Demand for Trade Credit: Evidence from Panel Data. Managerial and Decision Economics 24, 503-514.

Bellone, Flora; Patrick Musso; Lionel Nesta and Stefano Schiavo. 2010. Financial Constraints and Firm Export Behaviour. World Economy 33, 347-373.

Berger, Allen N. 1995. The Profit-Structure Relationship in Banking. Test for Market-Power and Efficient Structure Hypotheses. Journal of Money, Credit, and Banking 27, 404-431.

Berger, Allen N. and Gregory F. Udell. 2006. A More Complete Conceptual Framework for SME Finance. Journal of Banking and Finance. 30, 2945-2966.

Berger, Allen N. and Gregory F. Udell. 2002. Small Business Credit Availability and Relationship Lending: The Importance of Bank Organisatinal Structure. Economic Journal 112, 32-53.

Berger, Allen N. and Gregory F. Udell. 1998. The Economics of Small Business Finance: The Role of Private Equity and Debt Markets in the Financial Growth Cycle. Journal of Banking and Finance 22, 613-673.

Bernanke, Ben S. and Alan S. Blinder. 1988. Credit, Money, and Aggregate Demand. American Economic Review 78, 435-439.

Black, Sandra E. and Philip E. Strahan. 2002. Entrepreneurship and Black Credit Availability. Journal of Finance 57, 2807-2833.

Bonaccorsi di Patti, Emilia and Giovanni Dell'Ariccia. 2004. Bank Competition and Firm Creation. Journal of Money, Credit and Banking 36, 225-251.

Bonaccorsi di Patti, Emilia and Giorgio Gobbi. 2007. Winners or Losers? The Effects of Banking Consolidation on Corporate Borrowers. The Journal of Finance 62, 669-695.

Boot, Arnoud W. A. and Anjan V. Thakor. 2000. Can Relationship Banking Survive Competition? Journal of Finance 55, 679-713.

Bricongne, Jean-Charles; Lionel Fontagné; Guillaume Gaulier; Daria Taglioni and Vincent Vicard. 2012. Firms and the Global Crisis: French Exports in the Turmoil. Journal of International Economics 87, 134-146.

Burkart, Mike and Tore Ellingsen. 2004. In-Kind Finance: A Theory of Trade Credit. American Economic Review 94, 569-590.

Caglayan, Mustafa; Sara Maioli and Simona Mateut. 2012. Inventories, Sales Uncertainty, and Financial Strength. Journal of Banking & Finance 36, 2512-2521.

Canales, Rodrigo and Ramana Nanda, en prensa. A Darker Side to Decentralized Banks: Market Power and Credit Rationing in SME Lending. Journal of Financial Economics.

Carbó, Santiago and Rafael López. 2009. Bank-Lending Channel and Non-Financial Firms: Evidence for Spain. Spanish Economic Review 11, 125-140.

Carbó, Santiago; Hans Degryse and Francisco Rodriguez. 2012a. Lending Relationships and Credit Rationing: The Impact of Securitization. Mimeo.

Carbó, Santiago; Francisco Rodriguez and Gregory F. Udell. 2012b. Trade credit, the financial crisis and firms' access to finance. Mimeo.

Carbó, Santiago; Francisco Rodriguez and Gregory F. Udell. 2009. Bank Market Power and SME Financing Constraints. Review of Finance 13, 309-340.

Cardone-Riportella, Clara; Reyes Samaniego-Medina and Antonio Trujillo-Ponce. 2010. What Drives Bank Securitisation? the Spanish Experience. Journal of Banking & Finance 34, 2639-2651.

Cetorelli, Nicola. 2004. Real Effects of Bank Competition. Journal of Money, Credit and Banking 36, 543-558.

Cetorelli, Nicola and Michele Gambera. 2001. Banking Market Structure, Financial Dependence and Growth: International Evidence from Industry Data. Journal of Finance 56, 617-648.

Cetorelli, Nicola and Philip E. Strahan. 2006. Finance as a Barrier to Entry: Bank Competition and Industry Structure in Local U.S. Markets. Journal of Finance. 61, 437-461.

Claessens, Stijn; Hui Tong and Shang-Jin Wei, en prensa. From the Financial Crisis to the Real Economy: Using Firm-Level Data to Identify Transmission Channels. Journal of International Economics.

Clauss, Iris. 2011. Inside the Black Box: How Important is the Credit Channel Relative to the Interest and Exchange Rate Channels? Economic Modelling 28, 1-12.

Cull, Robert; Lixin Collin Xu and Tian Zhu. 2009. Formal Finance and Trade Credit during China's Transition. Journal of Financial Intermediation 18, 173-192.

Danielson, Morris G. and Jonathan A. Scott. 2004. Bank Loan Availability and Trade Credit Demand. Financial Review 39, 579-600.

Degryse, Hans and Steven Ongena. 2007. The Impact of Competition on Bank Orientation. Journal of Financial Intermediation 16, 399-424.

Degryse, Hans; Nancy Masschelein and Janet Mitchell. 2011. Staying, Dropping, or Switching: The Impacts of Bank Mergers on Small Firms. Review of Financial Studies 24, 1102-1140.

Ding, Sai; Alessandra Guariglia and John Knight, en prensa. Investment and Financing Constraints in China: Does Working Capital Management make a Difference? Journal of Banking & Finance.

Drucker, Steven and Manju Puri. 2009. On Loan Sales, Loan Contracting, and Lending Relationships. Review of Financial Studies 22, 2835-2872.

Elsas, Ralf. 2005. Empirical Determinants of Relationship Lending. Journal of Financial Intermediation 14, 32-57.

Fukuda, Shin-ichi; Munehisa Kayusa and Kentaro Akashi. 2006. The Role of Trade Credit for Small Firms: An Implication for Japan's Banking Crisis. Center for Advanced Research in Finance, University of Tokyo CARF-F-078.

Guariglia, Alessandra and Simona Mateut. 2006. Credit Channel, Trade Credit Channel, and Inventory Investment: Evidence from a Panel of UK Firms. Journal of Banking and Finance 30, 2835-2856.

Giannetti, Mariassunta; Mike Burkart and Tore Ellingsen. 2011. What You Sell is what You Lend? Explaining Trade Credit Contracts. Review of Financial Studies 24, 1261-1298.

Hirtle, Beverly. 2009. Credit Derivatives and Bank Credit Supply. Journal of Financial Intermediation 18, 125-150.

Huang, Hui; Shi Xiaojun and Shunming Zhang. 2011. Counter-Cyclical Substitution between Trade Credit and Bank Credit. Journal of Banking and Finance 35, 1859-1878.

Jiménez, G., Ongena, S., Peydró, J.L., and Saurina, J., 2010. Credit Supply: Identifying Balance-Sheet Channels with Loan Applications and Granted Loans, Discussion Paper 7655, CEPR.

Kashyap, Anil K. and Jeremy C. Stein. 2000. What do a Million Observationson Banks Say about the Transmission of Monetary Policy? American Economic Review 90, 407-428.

Mateut, Simona. 2005. Trade Credit and Monetary Policy Transmission. Journal of Economic Surveys 19, 655-670.

Mateut, Simona; Spiros Bougheas and Paul Mizen. 2006. Trade Credit, Bank Lending and Monetary Policy Transmission. European Economic Review 50, 603-629.

Nielsen, Jeffrey H. 2002. Trade Credit and the Bank Lending Channel. Journal of Money, Credit, and Banking 34, 226-253.

Ogura, Yoshiaki. 2012. Lending Competition and Credit Availability for New Firms: Empirical Study with the Price Cost Margin in Regional Loan Markets. Journal of Banking & Finance 36, 1822-1838.

Ogura, Yoshiaki. 2010. Interbank Competition and Information Production: Evidence from the Interest Rate Difference. Journal of Financial Intermediation 19, 279-304.

Oliner, Stephen D. and Glenn D. Rudebusch. 1996a. Is there a Broad Credit Channel for Monetary Policy? FRBSF Economic Review 1, 3-13.

Oliner, Stephen D. and Glenn D. Rudebusch. 1996b. Monetary Policy and Credit Conditions: Evidence from the Composition of External Finance: Comment. American Economic Review 86, 300-309.

Oliner, Stephen D. and Glenn D. Rudebusch. 1995. Is there a Bank Lending Channel for Monetary Policy? Economic Review-Federal Reserve Bank of San Francisco 2, 3-20.

Petersen, Mitchell A. and Raghuram G. Rajan. 1995. The Effect of Credit Market Competition on Lending Relationships. Quarterly Journal of Economics. 110, 407-443.

Presbitero, Andrea F. and Alberto Zazzaro. 2011. Competition and Relationship Lending: Friends Or Foes? Journal of Financial Intermediation 20, 387-413.

Scott, Jonathan A. and William C. Dunkelberg. 2010. Competition for Small Firms Banking Business: Bank Actions Versus Market Structure. Journal of Banking and Finance 34, 2788-2800.

Scott, Jonathan A. and William C. Dunkelberg. 2003. Bank Mergers and Small Firm Financing. Journal of Money, Credit and Banking 35, 999-1017.

Tsuruta, Daisuke. 2010. How does Small Businesses Finance their Growth Opportunities? the Case of Recovery from the Lost Decade in Japan.

Tsuruta, Daisuke. 2007. Credit Contagion and Trade Credit Supply: Evidence from Small Business Data in Japan.

Uesugi, Iichiro and Guy M. Yamashiro. 2008. How Trade Credit Differs from Loans: Evidence from Japanese Trading Companies.

Wu, Wenfeng; Oliver M. Rui and Chongfeng Wu, en prensa. Trade Credit, Cash Holdings, and Financial Deepening: Evidence from a Transitional Economy. Journal of Banking & Finance.

Zarutskie, Rebecca. 2006. Evidence on the Effects on Bank Competition on Firms Borrowing and Investment. Journal of Financial Economics 81, 503-537.