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Essays on Banking in Italy

Massimiliano Stacchini

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Docente Guida: Prof. Robert Waldmann

Coordinatore: Prof. Luigi Paganetto

Contents

Introduction

The work 'Essays on Banking in Italy' consists of three studies conducted at the Research Department of the Bank of Italy in the period 2005-2008. The first and the second study investigate pricing behaviour of banks on loans granted to private sector, i.e. to firms (*The Monitoring and certification effects of bankers on industrial boards)* and to households (*What's risk got to do with it ? An analysis of interest rates in the Italian consumer credit market*) while the third study (*Why is the volume of bank loans low in some countries and high in others? The role of government debt*) deals with the determinants of the size of business activity in developed countries.

The papers are not linked to each other. All of them reflect empirical analyses aimed to test some theoretical predictions taking advantage of data available at the Research Department of the Bank of Italy. In particular, in the first research, a database collecting information on board's composition of a very large number of firms (those registered at the Chamber of Commerce) was matched with other three sources of data, including the Central Credit Register, for the first time to the best of my knowledge. Such a matching allowed us to identify and study effects of bank representation on corporate board, and to discriminate between a beneficial monitoring activity as well as, alternatively, a costly conflict of interest.

In what follows, motivation and conclusions of each of the three papers are briefly summarised.

The research *'Monitoring and certification effects of bankers on industrial boards'* analyses the reasons driving the presence of bank directors on firm's boards and tries to discriminate between competing explanations. The presence of bank directors on industrial boards is a known fact in several developed countries. According to data reported by Kroszner and Strahan (2001), large firms having bankers on boards were 31 per cent in the US, 75 per cent in Germany, 53 per cent in Japan. Costs and benefits of bankers on boards are discussed by a growing strand of literature.

The study carried out an empirical analysis of the effect of bankers on boards on financial outcomes, focusing mainly on the interest rates charged to firms. Banks use to establish relationships with borrowers for mitigating problems of asymmetric information and reduce their credit risk (*information view*). Sitting on the board of a firm is an obvious way for a lender to extract private information about that firm. In addition, being on boards allow lenders to perform a more accurate screening of clients and to observe the outcomes of financed projects. In this way, potential opportunistic behaviours are prevented. By representing a long-term investments in relationships with borrower firms, representation on boards is expected to cut fixed costs of monitoring and to be reflected in a lower cost of financing.

Secondly, bankers on boards generate externalities. Information acquired from being on board - which generates informative advantages over other lenders - is partly transmitted to the market (certified) when the company is granted credit by banks represented on board. Such a certification in turn allows other providers of financing to avoid duplications of information costs on the capability to repay loans for the same firm. In that perspective, Boot (1992) noted that contracts may have lower monitoring costs as a result of information produced through 'cross-monitoring' activities by other claimants.

The possible dark side of bank presence on the boards of borrowing firms is the conflict of interests (*conflict of interests view*). The literature (see Crockett et al, 2003) suggests that *'conflicts arise when a financial service provider, on an agent within such a service provider, has multiple interests which create incentives to act in such a way as to misuse or conceal information need for the effective functioning of financial markets*'.

As far as we are concerned, conflicts are generated as bank directors have incentives to pursue interests of both debtholders - as board's member of the banks - and firm's shareholders – as board's member of the firms, under the assumption that the pay–offs of firm's debtholders and shareholders are not aligned (Kroszner and Strahan, 2001). Conflicts may affect pricing behaviour of lenders on boards, as they may grant loans at more favourable terms relative to similar risky loans granted by creditors which are outside the boardroom.

In Italy, credit institutions are an important source of external finance for firms and are expected to play some role in their corporate governance[1]. The presence of bankers on industrial boards has indeed been shown in several paper (e.g. Bianco and Pagnoni, 1998; Ferri and Trento, 1997). Conflicts of interests are attenuated by the Italian law by mean of restrictions to lending activity among banks and companies which have bank's directors on their boards (related parties)[2].

In this paper, the information view and the conflict of interest hypothesis are discriminated by examining how bank presence on boards of industrial firms affect interest rates applied to loans granted to firms. Our database is made of 32,000 Italian companies reporting information to each of the three data sources we resorted to: 'InfoCamere' for board compositions, 'Central Credit Register'

[1] Bank of Italy has recently relaxed the limits to banks holding in equity-stakes of industrial firms which were established by the 1933 Banking Law - as the 1956 Bank Holding Company Act did in the US.

[2] Loans granted to related parties have to be lower than the 20 per cent of bank capital.

for financial data, 'Balance Sheet Register' for data on firm's financial statements. Board's compositions of banks are provided for by 'Organi Sociali delle Banche' of the Bank of Italy. To our knowledge, this is the first study to be carried out on such a topic in Italy.

Our analysis shows that interest rates loans from the bank with a director who is also a director of the borrowing firm and those charged by other banks are very similar. Therefore, we do not find evidence of a conflict of interest effect.

In contrast, we find a significant certification effect supporting the information view. A lender on a corporate board reduces costs of monitoring of the bank represented on the board and transmits good signals on the firm's creditworthiness to financiers which are outside the boardroom. Our evidence is in line with Boot (1992) who noted that contracts may have lower monitoring costs as a result of information produced through 'cross-monitoring' activities by other claimants.

In the research '*What's risk got to do with it ? An analysis of interest rates in the Italian consumer credit market'*, we investigate the determinants of the price of consumer lending in Italy. This study was stimulated by the high level of Italian interest rates in comparison with the euro area countries. In our sample period (2003-2006), interest rate on consumer loans in Italy has consistently been above the euro area, a difference hovering around two percentage points. The expansion of the market - that led the country to double its share of the euro area market between 1999 and 2006, from 4 per cent to 8 per cent - started denting the differential in interest rates but, still in the first half of 2008, the APRC on consumer credit was 9.7 per cent in Italy, and 7.6 in both France and Germany.

The consumer credit market has been regarded as characterised by three distinct features: small size of the business, rapid growth, high cost of loans (Gobbi, 2007). Media, policymakers, consumer associations repeatedly pointed out that interest rates are high and may not entirely be justified by the characteristic of borrowers. According to data collected in compliance of the usury law, the average rate on instalment and revolving loans up to 5,000 euros in the third quarter of 2006 was above 16 per cent while, in the same period, the main policy rate of the European Systems of Central banks was 2.75 per cent (3 per cent since mid -Oct 2006) and the non-performing loans ratio for consumer credit was only 1.7 per cent for banks. A peculiarity of the consumer credit market is the level of business concentration which is higher than other retail lending categories, at least according to Herfindahl or market shares measures.

In 2007, the Governor of the Bank of Italy remarked that: '*Data harmonized at European level show that Italian banks' annual percentage rate of charge on consumer credit is still about one percentage point higher than the euro area average, even though the gap has narrowed in the* *last few months. Not all of the difference is due to risk factors or to the still limited development of the consumer credit market in Italy".*

Up to now, there have been a very few attempts to investigate those factors which driving the cost of loans for consumption, perhaps due to the small size of this market - until a few years ago - and to the fact that data on price availability were (and, partly, still are) scarcely available.

Bertola et al (1999) which is the most comprehensive study of pricing of consumer credit in Italy to our knowledge analyse determinants of the interest rates recorded in a proprietary database made available by a leading intermediary. According to their results, heterogeneity is mostly accounted for by time, region and type of item purchased, plus a limited number of contract characteristics.

We study the pricing behaviour of a large sample of Italian banks, which are representative of the entire population. Our results suggest that, ceteris paribus, concentration level exerted a significant influence on pricing conditions. On the contrary, a missing element in the price equation is risk. According to results from a quintile regression approach, we may track down a standard relationship between risk and prices only as for the lowest quintiles of the interest rate distribution. As well as interest rates applied by banks above the median prices are concerned, costs of lending seem to be less sensitive to risk. More recently, Magri (2008), looking at the Household Survey of the Bank of Italy (SHIW, 2008) find that the price of consumer loans is barely connected to the specific household risk of delinquency, or default, in line with our results.

In the paper '*Why is the volume of bank loans low in some countries and high in others? The role of government debt'* we look at the determinants of the size of banking markets. The analysis is stimulated by the fact that an extensive literature emphasised the importance of banking system in promoting economic growth, as it is confirmed by substantially higher credit to GDP ratios for higher-income countries. If factors limiting banking development are singled out, then political authorities may introduce reforms to foster this development.

Both developed and developing countries are heterogeneous as far as the size of their banking systems is concerned. Among the former, in 2004, the ratio of loans to GDP was around 46 per cent in the US, 77 per cent in France and 100 per cent in Germany.

We investigate factors driving those cross-country differences by exploiting a longitudinal dataset for 18 OECD countries which range over the period 1981-1997.

Several strands of literature studied how the level of banking intermediation is influenced by economic and institutional factors. The Financial Repression approach underlined the link between the financial development of countries and the array of restrictions, policies, laws, qualitative and quantitative controls set up by government by the second half of the 60's for financial stability purposes. These restrictions introduced distortions in the allocation of resources (Battilossi, 2003) and made costly for financial intermediaries to operate at their full technological potential (McKinnon,1973; Show, 1973, Roubini and Sala - i – Martin, 1995). According to some scholars, financial repression also generated revenues for the state, interest groups or lobbies (Perotti and Von Thadden, 2005).

Other studies track down the heterogeneity in financial deepening to the their history. Path dependency theories of financial development trace back cross-country differences we observe today to the legal origins of the countries (La Porta *et al*, 1997).

The novelty of the paper is to shed a light on the negative linkages between government securities issuance and the amount of credit granted by banks to private sector. We find a crowding–out effect that we interpret as an outcome of financial repression, along the lines described above (Battilossi, 2003). As well as Italy is concerned, restrictions to financial activity operated through credit ceilings and branch restrictions which may have shrunk bank supply of financing to private sector, on the one hand, and artificially channelled bank resources to domestic assets such as the public debt[3], on the other hand.

Secondly, we find that a part of cross-country variability of banking deepening not accounted for time-varying factors is explained by the legal origin of countries. As we restrict the study to the size of banking market – and not to financial systems as defined by some more comprehensive indicators - we do not identify the Anglo-Saxon legal origin as the crucial factor for promoting credit systems. According to our evidence, the German legal origin happens to be the most effective.

[3] Until the divorce of 1981, the Bank of Italy acted as automatic buyer of last resort in primary auctions of short-term Treasury bills which was generally reserved to banks and financial intermediaries. Later on, the placement of these securities was realised with the domestic market. Further, the demand of such an asset was increased via reserve requirements of banks, as the minimum level fixed by the law was not negligible in the 80's and government bonds were allowed to meet that requirement.

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The monitoring and certification roles of bankers on industrial boards *

(under revision, please do not quote)

Abstract

There is a large literature on the effects of the presence of bankers on firms'boards as these bankers may reduce monitoring costs by facilitating information flows between the lender and the borrower, may credibly certify the financial soundness of the firm to other creditors who are not represented in the board and may act as financial experts for the management. At the same time, lending bankers on boards may have a conflict of interests. In this paper, we study the impact of the presence of bankers on firms' boards on interest rates charged to firms. As interest rates on loans from the board director's bank and from other banks are very similar we do not find evidence of a conflict of interest effect.

*I would like to thank Giacomo Cau (Bank of Italy) for help with the dataset. This research has benefited from helpful suggestions from Robert Waldmann. The usual disclaimer applies. The views expressed in this article in no way involve the responsability of the Bank of Italy.

1 Introduction

The presence of bank directors in company boards of industrial firms is a known fact in several industrialised countries. According to data of Kroszner and Strahan (2001), 75 per cent of large firms have bankers on their boards in Germany, 53 per cent in Japan, and 31 per cent in the US.

In this paper, we analyse the reasons driving the presence of bank directors on firms' boards and try to discriminate between competing explanations. We carried out an empirical analysis of the effect of bankers on boards on financial outcomes, focusing mainly on the interest rates charged to firms. To our knowledge, this is the first study to be carried out on such a topic in Italy.

As in other industrialised countries, banks' directors are not prohibited by Italian law from taking up positions on industrial firms' boards. The existence of close ties between creditors and borrowers can be expected to be associated with the importance of the banking system as a source of external finance for firms. Demirguk-Kunt and Levine (2001) distinguish bank-based from market based systems. In the former group - which includes the universal bank system of Germany and the main bank system of Japan - close ties exist as banks are regarded as retaining both functions as main creditors and shareholders of companies and are therefore expected to be represented on borrowers' boards. On the contrary, in market-based systems - which include the Anglo-Saxon systems - securities markets share center stage with banks in terms of getting society'saving to firms, exerting corporate control and easing risk management.

Italy is usually counted among bank-oriented countries because companies rely heavily on bank debt as a source of external finance. However, two things make its position somewhat peculiar. Firstly, close ties between banks and firms have been ruled out by the Italian legislation: bank holdings in equity-stakes of industrial firms were prohibited by the 1933 Banking Law - in the same way as the 1956 Bank Holding Company Act did in the United States. They are still limited even after the approval of the Banking Code in 1993[1]. In 2003, the share of bank holdings in firms' equity was still tiny (Bianchi et al, 2005) [2]. Secondly, the fragmented nature of the lending relationships has been regarded as resembling the transaction-based lending schemes rather than the German *housebanks* system (Cesarini, 1994).

In Italy, bank's presence on corporate boards was investigated in several studies (e.g. Bianco and Pagnoni, 1997; Ferri and Trento, 1997). These researches suggest that the interlocking directorates between banks and industrial firms may have somehow substituted for the ownership links which the law had prevented and may have allowed a coordination of strategies.

Recent debate focused on benefits and costs of bank representation on corporate boards. The literature distinguishes between an 'information view' and a 'conflict of interest view'.

The 'information view' predicts roles for bankers on boards as monitors of borrowers' private information and as credible certifiers of firms' financial

[1] In July 2008, the restrictions to banks' shareholdings of non financial firms have been aligned to the Second EU Directive on banking. Banks can now invest as much as the 60 percent of their capital in firms' equity stakes as a whole, and up to 15 percent of their capital in equity as of single firms.

[2] The average financial intermediaries holdings in equity stakes of listed (industrial) firms was 1,9 percent in 2003.

soundness. Banks use to establish relationships with borrowers for mitigating problems of asymmetric information and reduce their credit risk. Sitting on the board of a firm is an obvious way for a lending-banker on board to extract private information about that firm (*monitoring hypothesis*). Secondly, bankers on boards generate externalities. Information acquired by bank directors from their position on a firm's board is transmitted to financial markets when the banks affiliated to the bank directors extend credit to that firm. The certification may allows other financiers to avoid duplications of monitoring costs (*certification hypothesis*).

The possible dark side of bank presence on the boards of borrowing firms is the conflict of interests *(conflict of interest hypothesis).* The literature (see Crockett et al, 2003) suggests that

> 'conflicts arise when a financial service provider, on an agent within such a service provider, has multiple interests which create incentives to act in such a way as to misuse or conceal information need for the effective functioning of financial markets'

As far as we are concerned, insider lending practices may impact on the link between the cost of credit and the risk profile of borrowers.

To examine the roles and effects of the banking presence on corporate boards we used a cross-section of around 32,000 Italian firms, which were investigated within a linear OLS framework. In 2005, these companies reported information to each of the three sources of data we resorted to: 'Central Credit Register' for financial data, 'InfoCamere' for board compositions, and 'Balance Sheet Register' for data on firms' financial statements. Board compositions of banks are provided for by 'Organi Sociali delle Banche'. Group affiliation of banks was taken into account for identifying the business relationships between a firm and its lenders.

The remainder of the paper is organised in three sections: Section 2 describes the main theoretical contributions to the analysis of bank's presence on corporate boards. Section 3 estimates its the causal effects on pricing conditions applied to firms. Section 4 concludes.

2 Review of the literature

In this section we review papers which provide a rational to the presence of bank directors on corporate boards. From these theories we derive testable implications for the sensitivity of the cost of debt to banks' presence on firms' boards. Briefly, the literature underlines three roles for the bankers on boards: the *monitoring* and *certification* roles for lending bankers on boards, i.e. for those directors of banks having a lending relationship with the firms where they have the seat and the role as *financial expert* for non lending-bankers on boards, i.e. for those directors of banks which are not lenders of the firms where they have the seat. As for the first type of bankers, the alternative theories predict a costly conflict of interest.

Monitoring hypothesis. Bank directors on boards decrease the costs of monitoring by directly providing to creditors with private information on borrowers[3].

[3] Boot(2000) defines relationship banking as 'the provision of financial services by a financial

Being on boards provides the flexibility to adapt to changing circumstances and to obtain information relevant for the current situation, without the cost of producing data relevant to each contingency described in the original contract (Kroszner and Strahan, 2001). From their position, lenders may perform an accurate screening of clients, may observe the outcomes of financed projects and may prevent potential opportunistic behaviors. Pfeffer (1972) looks at banks' presence on boards as a channel to be aware of the internal environment of companies while Williamson (1988) views the outcomes arising to lenders on boards as superior to those originated by loan covenants. Roles as monitors are identified for lending bankers on boards in Japan (Kaplan and Minton, 1994), and the United States (Byrd and Mizruchi, 2005).

Certification hypothesis. According to the literature on reputational signaling, a firm's value increases when (positive) signals are transmitted to the market by informed agents, i.e. firm's creditors. Lummer and McConnel (1989) show that the announcements of loan renewals play a certification role about the financial conditions of the borrowers.

In our setting, bank directors holding positions on a firm's boards are suitable for being seen as informed claimholders by other lenders in view of their incentive to control for the firm's ability to repay the loan. When the bank affiliated to these directors grant a loan to the firm where they have a seat credible signals on the firm's soundness are transmitted to financial markets.

Boot (1992) notes that contracts may have lower monitoring costs as a result of information produced through cross-monitoring activities by another claimant. The benefit of cross-monitoring activity may involve simply noting the presence of another claimant, information associated with monitoring other claims, or observation of price of other claims through secondary trading (Boot, 1992).

According to Casolaro et al (2005), a certification of borrowers' conditions is provided by the arrangers of syndicated credit facilities [4]. A related strand of literature has underlined the phenomenon of free-riding in the monitoring activity (Cetorelli and Peretto, 2000; Carletti et al, 2007).

Financial expertise hypothesis. Fama and Jensen (1983) claim that outside directors add relevant complementary knowledge to the management, depending on their performance as managers in other organizations. According to Booth and Deli (1999), non lending bankers on boards are requested to join a firm's board for providing to the management with their financial expertise. Compared to financially unskilled directors, they are assumed to have a comparative advantage in evaluating alternative debt contracts or pricing arrangements (Mace, 1971) and in accurately dealing with firms' financial statements [5]. Rosenstein and Wyatt (1990) demonstrate that the additions of directors who are officers of financial firms increase firms' value.

Conflict of interest hypothesis. Lending bankers on boards may have a con-

intermediary that invests in obtaining customer-specific information, which is proprietary in nature; and that evaluates profitability of these investments through multiple interactions with the costumer (Boot and Thakor, 2000). In this perspective, the bank presence on borrowers' boards enhance the scope of the relationship.

[4]The arrangers of syndicated loans provide direct signals when the share of the facilities they retain increases.

[5]In the US, the Sarbanes-Oxley Act (2002) explicitly calls for financial literacy on audit committees (Section 407). "An understanding of generally accepted accounting principles and financial statements has been quoted as a requisite for taking up the positions on the boards.

flict of interest. As board members of banks, directors have the fiduciary duty to serve the interests of debtholders, but as directors with firms, they have the fiduciary duty to serve the interests of (firms') shareholders (Kroszner and Strahan, 2001). Conflict arises as creditors and shareholders have a different structure of pay-offs (Jensen and Meckling, 1976) [6]. As well as the effects of conflicts on financial outcomes are concerned, bank directors may have incentives to engage in insider lending practices at the expense of both bank equities and the regulator. The conduct of business of lending bank directors on boards may cause loans granted at favorable terms to firms where they hold a position relative to equally risky loans granted by other lenders (Laeven, 2001; La Porta et al, 2003).

Table 1: Roles played by bank directors with positions on company boards

Firms having banks' directors on boards			
No	Yes		
	Non lending banker	Lending banker	
		Lending relationships with lenders outside the board	Lending relationships with lenders on board
	EXPERTISE	EXPERTISE	EXPERTISE
		CERTIFICATION	
			MONITORING VS CONFLICT

Summary. In Table 1 and Figures 1-2 we summarise the roles that it is suitable for bank directors to play when they hold seats on boards of industrial firms. Following Table 1 and Figure 1, a lending bank director on boards is expected to influence - by lowering monitoring costs - the lending relationships between the firm where he has a seat and the bank affiliated to the banker (MONITORING). In addition, a lending bank director on boards may be expected to influence - by certifying credibly the firm's soundness - the lending relationships between the firm where he has a seat and those lenders which are not represented on boards (CERTIFICATION). According to an alternative view, the lending relationships between the banks affiliated to a lending banker and the firm where he has a seat have a conflict of interest (CONFLICT).

Non lending bank directors on boards - as well as lending bank directors on boards - are suitable to endow firms' managements with their financial expertise (EXPERTISE).

[6] Pay-offs of creditors are low if firms go bankrupt but are limited if firms' profits are high. Creditors aim at the repayment of the loans by discouraging risky investments whose benefits are not fully gained, while borrowers are protected by large losses and maximize the return to shareholders by promoting projects with both high expected pay-off and variances. According to Dewatripont and Tirole (1994), the conflict would be mitigated if creditors would allow to become shareholders by holding some equity stake in the borrowing firms.

3 The data and the econometric results

In this section, we move to (empirical methods for) identifying bank representation on corporate boards and its effects on financial outcomes. Section 3.1 describes the variables we use and our sources of statistics. Section 3.2 verifies whether the bank representation is widespread across the geographical location of companies, and types of credit institutions. We also compare the financial characteristics of firms having bank representation on boards to those of their peers. Section 3.3 reports the outcomes of our regressions and some post-regression tests which assess the sensitivity of interest rates to our governance indicators.

3.1 Data description.

We need information on boards' members of banks and industrial firms on the one hand, and data on banks' lending activity to retail customers on the other. We also need the financial statements of companies in order to control borrowers' risk profiles. This information was obtained by resorting to four sources of data: Balance Sheet Register (BRS), Central Credit Register (CCR), Organi Sociali delle Banche (Or.So.) and Infocamere. Information was exploited as for a cross-section analysis based on 2005 data. In Table 2, the variables are listed. They are broken down into four sets of attributes: *governance-information characteristics, loan contract characteristics, firms' financial characteristics, and traditional relationship characteristics.*

Governance-information and traditional relationship characteristics were defined at a bank-group level, to avoid potential losses of information owing to creditors' strategies set out at group-level.

The Balance Sheet Register provided us with the sample of firms used in the study. It consists of around 32,000 industrial firms [7] which were registered in BSR [8] in the fiscal year 2005, and which survived after cleaning outliers from the dataset [9]. The auxiliary companies *(enti strumentali)* were excluded from the exercise. The sample is biased toward larger firms. The median of the distribution of firms' number of employees is equal to 40 and the first and the third quartiles are equal to 19, and 80, respectively. In Italy, the average number of employees in a firm is equal to 4.

Governance-information characteristics. Bank representatives on corporate boards are the key variable of our study. Organi Sociali delle Banche (OR.SO.) and Infocamere are the sources of information. As for the lender side, the Bank of Italy collects data on board members from the entire population of banks [10].

[7] Size of our sample lines-up with those as of some previous studies on relationship banking as for Italy: Conigliani et al (1997) and Ferri et al (2000) exploit a samples of 32,000 firms. Further, D'Auria et al (1999) use an unbalanced panel of 2,331 firms, which spans from 1987 to 1994. Petersen and Rajan (1994) verify predictions of relationship banking literature investigate looking at 3404 firms.

[8] Firm eligible for joining the BSR database were those indebted with (at least) a bank participating in a consortium of creditors put up for sharing data on financial statements of borrowers. The consortium includes all larger credit institutions operating in the Italy.

[9] Row data on interest rates reported by credit institutions to the Central Credit Register and by firms to Balance Sheet Register were cleared of severe outliers. These outliers make up about 0.0002 percent (two per million) of a Gaussian population and have substantial effects on means, standard deviations and other statistics.

[10] Data include identities, hierarchical positions - president, vicepresident, executive director,

Table 2: Variable description

Variable name	Description
Contract characteristics:	
C/L	Interest rate on credit lines
ACC/REC	Interest rate on loan secured by accounts receivable
F/TERM	Interest rate on fixed term loans
TRANCHE	(log of) Amount of loan in Euros
COLLATERAL	=1 if loan is secured by real collateral
Governance-information: characteristics:	
BANK	=1 if firm has (at least) a banker on boards
NOLEND-BANK*	=1 if firm has (at least) one non-lending banker on boards
LEND-BANK *	=1 if firm has (at least) one lending banker on boards
BY-LENDER*	=1 if loan is granted by the lending banker on boards
BY-OTHER *	=1 if loan is granted by lenders without board positions
Firms'financial characteristics:	
EQUITY/DEBT	Equity to debt
UNCOVERAGE	Interest expenses to gross operating margins
LIQUIDITY	Short term assets to short term liabilities
ASSETS LIQUIDITY	Liquid assets to total assets
TANGIBILITY	Tangible assets to total assets
PROFITABILITY	Return on equities
SIZE	(log of) Sales
	Assets
	Number of employees
Traditional relationship characteristics :	
MULTIPLE*	Number of creditors of the firm
TOP-LENDER*	=1 if creditor is the main lender for the firm
LENGHT*	Duration of the bank-firm relationship (number of years)
Industry characteristics:	23 economic branch-level dummies
Local mark.characteristics:	20 regional area-level dummies
Creditor characteristics:	213 individual bank (or 138 bank group) level dummies

* This variable is defined at group bank-level. All individual banks who join a bank group are treated as they were the same entity.

As for the firm side, 'Infocamere' databases are collected by the Italian Camera di Commercio and drawn from all firms which are registered with the chamber.

By merging 'OR.SO.' with 'Infocamere', banks' presence on corporate boards of firms was found. Banks' presence on company boards of non financial firms was established whenever a member of the bank's board of directors (IN) was found out either on a firms' board of directors (IN) or a firm's board of auditors (OUT) [11].

We modeled the effect on risk premium arising from the types of bank presence which are meaningful from a theoretical point of view (see Table 1). We considered all firms with (at least) one bank director on their boards (BANK); firms with (at least) one *non-lending* bank director on their boards (NOLEND-BANK); firms with (at least) one *lending* bank director on their boards (LEND-

director - the date of appointment and resignation, for each of the members of either the board of directors and the Supervisory board

[11] In order to discriminate between the 'information view' and the 'conflict of interest view' we considered the incentives of a bank directors to pursue the interests of the firm where he has a seat. These incentives may stem from their positions in either the firm's board of directors and board of auditors.

BANK). These effects were modeled through firm-level dummy variables. Further, according to Table 1, credit extended to firms with a lending banker on their boards was clustered into two classes: the first class includes facilities granted by the lender on boards (BY-LENDER); the second class includes facilities granted by other creditors without board positions in the firm (BY-OTHER). The effects exerted on these two classes of facilities were captured through loans-level dummies.

Contract characteristics. Data exploited in our analysis were provided by the Central Credit Register of the Bank of Italy. Loans are reported when tranches exceed Euro 75,000 by a sample of 213 credit institutions. These entities account for 90 percent of Italian banking credit to firms. Contract information include the interest rate asked for by creditors on credit lines (C/L), on loans secured by accounts receivable (ACC/REC), and on fixed-term loans (F/TERM)). Further information includes the size of loans (TRANCHE) and the degree of real collateralisation (COLLATERAL) of loans.

Levels of interest rates depend on the types and characteristics of loan contracts[12] (Berger and Udell, 1995; Petersen and Rajan, 1994). According to Berger and Udell (1995), among the typologies of facilities, credit lines (C/L) are the most attractive vehicle for studying the impact of lender-borrower relationships. As they represent a forward commitment to provide capital financing under specified terms, lines of credit formalise the relationship between the two parties. On the borrower side, they provide the firm with the option to use less than the amount granted by the creditor, and to pay interest only on disbursed facilities. On the lender side, terms of contracts may be changed at any point in time. Previous research on the impact of the lender-borrower relationship in Italy was conducted by D'Auria et al (1999), Angelini et al (1998), Guiso (2007). All these studies investigate the interest rates charged on credit lines[13]. In line with the literature, we exploited credit lines as our main source of data for studying bank-firm relationships as defined by presence on corporate boards. Our results still hold for loans secured by accounts receivable, while they are mixed for term-fixed loans. We will discuss this issue later on in the paper. Loans secured by accounts receivable (ACC/REC) consist of (short-term) loans which are assisted by trade credit guarantees. Ceteris paribus, they are expected to be cheaper than other loans. Carmignani and Omiccioli (2007) regard (C/L) and (ACC/REC) as devices for generating flows of proprietary information on borrowers[14]. TRANCHE matters in reducing the interest rate charged by banks, as it proxies for scale economies achieved by banks (Booth, 1992). Further, larger loans are expected to be extended to firms having a stronger bargaining power with the banks. As Berger and Udell (1990) pointed out, COLLATERAL decreases the riskness of a given loan, since it gives the lender a specific claim on an asset without diminishing its general claim against the borrower. If borrowers who pledge collateral are riskier on average than borrowers who do not, then secured loans may be either safer (interest rate lower)

[12]In Italy, the means and dispersions of the distributions of interest rates strongly varies across instrument categories. As for interest rates on credit lines, they are twice and three times greater than the means and standard deviations of the other categories, respectively.

[13]Sapienza (2002) uses the same type of loan contract for assessing the impact of bank mergers on the cost of credit.

[14]Lenders may get information about borrowers by having access to firms' transaction accounts.

or riskier (interest rate higher) than unsecured loans. These statements line-up with results obtained by Calcagnini et al (2007) for Italy. They find a positive linkage between collateral and cost of credit, which reflects the greater riskiness of borrowers who pledge collateral. The linkage turns out to be negative once the risk profile of borrower firms is properly controlled for.

Firms' financial characteristics. This group of variables includes key information on firms which are drawn from BSR. Firms' financial characteristics are considered by analysts as broadly exhaustive for controlling the observable risk of borrowers. Ceteris paribus, banks would gain higher risk premiums from riskier companies. As proxies of SIZE, we look at sales, the number of employees and total assets. Larger companies usually pay lower interest rates as they are expected to have a lower default risk. PROFITABILITY of companies is proxied by the return on equity (ROE). In principle, more profitable firms signal to credit institutions a lower probability of default. TANGIBILITY of assets negatively affects the risk premium of lenders as it reduce the potential costs of bankruptcy for lenders. Banks interpret tangible assets as an index of borrowers' transparency making these assets a collaterals eligible for refunding creditors (Kroszner and Strahan, 2001). UNCOVERAGE (interest expenses/gross operating margins) reveals the difficulty the firm has in paying interests out of cash-flows and without resorting to additional debt (Hoshi et al 1990; Hall and Weinstein, 2000). A higher UNCOVERAGE index predicts greater risk for banks owing to the increased probability of financial distress. LIQUIDITY (short term assets/short term liabilities) alerts banks to the difficulties borrowers may incur when they face short-term liquidity needs. More liquid borrowers are expected to be asked for lower liquidity risk premiums.

Traditional relationship characteristics. In this category we grouped variables which traditionally have been considered by the literature on the relationship banking (Boot, 2000). LENGTH captures the duration of a lending relationship. The probability of loan repayment is expected to increase when a previous experience with the borrower is available to the lender (Petersen and Rajan, 1994). TOP-LENDER captures the *scope* of the relationship. The main bank of a firm may be expected to 'cross-sell' several lending and non lending products to its client. The cost of a single loan may reflect the lessening in monitoring expenses which turn out to be spread over the entire duration of the relationship and across the array of products cross-sold to the firm. MULTIPLE shows the number of creditors from which the firm borrows. It correlates negatively with the cost of credit if it is assumed to proxy for the degree of competition in banking. Alternatively, a positive link is expected when it is assumed to proxy for firms' quality (Petersen and Rajan, 1994). Lower quality firms which are unable to borrow additional money from their original bank may be compelled to approach other creditors.

Table 3 gives the distribution of loans to industrial firms, broken down by firms' geographical location and type of bank presence on boards, as for the theoretical setup of Table 1. The bottom of the table shows the importance of the phenomenon, in terms of business coverage. Loans granted to firms having some bank directors on boards account for 13 per cent of total credit to industrial firms. Within this aggregate, 8 per cent is granted to firms having *lending* bankers on their boards. This group of firms is indebted with the *lenders* on boards for an amount which accounts for 2 per cent of credit (*monitoring hypotheses*). These loans may also be exposed to the conflict of interest generated

Table 3: Distribution of loans by type of bank's presence on firm's boards and firm's geographical location in 2005 (number of contracts).

	Loans to firms with bank directors on boards				
	No	Yes			
			Non lending banker	Lending banker	
				Loans from other lenders	Loans from lenders on boards
Region			(expertise)	(certification)	(monitoring vs conflict)
PIEMONTE	22,719	963	590	304	69
VALDAOSTA	280	16	16	0	0
LOMBARDIA	86,137	3,449	1,953	1,211	285
LIGURIA	5,674	148	37	86	25
TRENTINO	4,039	559	321	191	47
VENETO	38,443	1,556	972	472	112
FRIULI	7,675	378	220	131	27
EMILIA	39,963	1,717	721	843	153
TOSCANA	26,264	1,027	598	344	85
UMBRIA	4,556	263	214	39	10
MARCHE	10,418	603	241	297	65
LAZIO	14,185	639	417	190	32
ABRUZZO	4,754	180	106	62	12
MOLISE	584	18	18	0	0
CAMPANIA	10,836	241	163	68	10
PUGLIA	5,391	206	131	59	16
BASILICATA	591	41	16	20	5
CALABRIA	1,718	116	64	45	7
SICILIA	6,548	286	171	92	23
SARDEGNA	2,287	27	4	10	13
Total	293,062	12,433	6,973	4,464	996
Business coverage		0.13	0.05	0.06	0.02

by having *lenders* on boards. Firms having *lenders* on their boards are indebted with banks having no board positions in the firms, for an amount which accounts for 6 per cent of industrial credit (*certification hypothesis*). Another 5 percent of credit is extended to firms with *non-lending* bankers on their boards[15].

Residence of borrowers does not have any bearing on the distribution of loans to firms by presence of bank directors (Table 3). Regions such as Lombardia, Veneto, Emilia, Toscana, preserve their relative positions across the columns of the table. As for the lender side, facilities are mostly extended by company banks and cooperative banks (Table 4). Further, the distribution of loans across the institutional classification of credit institutions seem to be orthogonal to our governance indicators.

Now we turn to firm-level data (Table 5). In 2005, BSR data included 1,440 companies with (at least) one bank director on their boards. Within this group, 918 companies had a non-lending bank director while 523 have a lending one.

Firms with bank directors on their boards are larger in SIZE. Companies without bank directors employed 37 individuals to be compared with 46 indi-

[15]In terms of number of contracts, 12,433 loans (4.2 per cent) are granted to firms with some bank director on boards, 6973 (2.3 per cent) are granted to firms having non lending bank directors on boards. Firms having lending bank directors on boards are granted 996 contracts by the lenders on board (less than 1 per cent) and 4,464 by lenders outside the board (1.5 per cent).

Table 4: Distribution of loans by type of bank's presence on firm's boards and institutional type of creditors in 2005 (number of contracts).

	Loans to firms with bank directors on boards				
	No	Yes			
			Non lending banker	Lending banker	
				Loans from other lenders	Loans from lenders on boards
Type of creditor			(expertise)	(certification)	(monitoring vs conflict)
COMPANY BANKS	244,055	10,325	5,882	3,755	688
(BR.OF) FOREIGN BANKS	1,020	96	30	65	1
COOPERATIVE BANKS	40,285	1,655	863	581	211
MUTUAL BANKS	7,702	357	198	63	96
Total	293,062	12,433	6,973	4,464	996

Table 5: Financial characteristics of firms, by type of bank's presence on firm's boards in 2005 (medians of firm-level data).

		Firms with bank directors on boards			
		No	Yes		
				Non lending banker	Lending banker
SIZE	employees	37	47	46	54
	assets	7,165	10,175	9,617	11,816
	sales	8,902	11,650	11,789	12,740
UNCOVERAGE		0.78	0.73	0.74	0.72
TANGIBILITY		0.09	0.18	0.14	0.25
LIQUIDITY		1.14	1.15	1.16	1.13
ASSETS LIQUIDITY		0.79	0.70	0.71	0.69
EQUITY/DEBT		0.45	0.57	0.56	0.62
ST-DEBT		0.83	0.74	0.76	0.72
ROE		4.60	4.13	4.19	3.98
MULTIPLE		4	4	4	5
TOP-LENDER'S SHARE		0.54	0.54	0.59	0.47
N		32,407	1,441	918	523

viduals employed in firms with non-lending bank directors and 54 in firm with lending ones. Similar patterns are exhibited by other proxies for size, such as revenues and assets. TANGIBILITY of firm's assets - given by the net value of plant, property, and equipment as a share of total assets of firms - increases when we move from firms without bankers on boards (0.09) to firms with non-lending (0.14) and lending (0.25) bank representation on boards. Thus, bankers serve on boards of companies whose assets are more tangible. Firms with bank directors on boards seem to have greater debt-servicing ability (UNCOVERAGE). They report lower flows of interest expenses - as a share of gross operating margins (0.73), with respect to firms with non bank directors on their boards (0.78). ASSET LIQUIDITY shows that firms with bank directors (0.70), are likely to be less liquid than their peers (0.79) [16]. Firms with bank directors

[16] Kroszner and Strahan (2001) have a similar findings for the United States. They quote Mulligan (1997) who pointed out how as large firms tend to exhibit scale economies in their

have lower ratios of short-term to total bank debt (ST-DEBT). These findings are broadly in line with those reported by Kroszner and Strahan (2001) for the United States.

3.2 Does bank representation on corporate boards affect the cost of credit?

The objective of this section is to measure the sensitivity of the cost of credit to bank representation on corporate boards. Again, we perform our empirical exercise having in mind the theoretical framework summarised in Table 1. First, we show some descriptive statistics. Then, we run regressions and insulate the causal effects which emerge from an OLS linear model. Finally, we perform Wald tests to check the significance of differences in the coefficients.

In Table 9 we report descriptive statistics on averages interest rates, broken down by type of bank's presence on firm's boards. Interest rates and our governance variables are not orthogonal. As for credit lines, firms with bankers on their boards pay on average 6.89 per cent, while firms without bankers on their boards pay 8.09 per cent. Firms with lending bankers on their boards pay on average 5.93 per cent on loans granted by lenders with board positions (*monitoring hypothesis*) and 6.65 per cent points on loans granted by lenders without board positions (*certification hypothesis*). Firms with non-lending bankers on boards are charged 7.21 per cent (*expertise hypothesis*).

In order to avoid spurious correlations, we turn to a multivariate analysis.

In the same way as the relationship banking literature, our analysis is based on the interest rate asked for by creditors on credit lines. We run OLS regressions of alternatives based on the following specification (see Table 2):

Interest rates $= \beta$*(Contract characteristics)* $+\gamma$*(Governance -information characteristics)* $+\delta$*(Firm's financial characteristics)* $+\zeta$*(Traditional bank -firm relationship characteristics)* .

Each regression also includes 20 regional location dummies, 23 economic sector dummies, which are based on the branch classification adopted by the Bank of Italy, and the dummy PUBLIC, to separate private from state-owned companies. We also control for characteristics of lenders by including individual bank-level dummies or bank group-level dummies, in separate regressions. Table 6 shows summary statistics for the variables employed in the model.

Results. In Table 10 the results of the baseline specification are displayed for the interest rate on credit lines (C/L). The goodness of fit as expressed by R^2 statistics ranges from 0.29 to 0.30. In modeling interest rates on credit lines, Petersen and Rajan (1994) found R^2 equal to 0.15 while in the case of Italy, Angelini et al(1998) found R^2 equal to 0.17.

Governance-information characteristics. In column (1) we measure the impact on the interest rates charged to firms of having at least one bank directors on boards (BANK). The coefficient is equal to -0.49 and it is significant at a 1 per cent probability-level. This means that, ceteris paribus, these firms pay 49 basis points less than firms without a bank director on their boards. As BANK identifies all firms having at least one bank directors on their boards - regardless

demand to hold cash and liquid assets. Therefore, differences in liquidity ratios may be driven by firms' size .

the attribute *lending/non lending* - we can not associate the effect to a specific role played by the bank directors on boards.

In columns (2) we separated those firms having one *non lending* banker on their boards (NOLEND-BANK) from those having one *lending* banker on their boards (LEND-BANK). Coefficients for NOLEND-BANK and LEND-BANK are now equal to -0.35 and -0.71 respectively. As firms whose dummy NOLEND-BANK is equal to 1 have no business relationships with the bank, we impute the effect to the expertise provided by bank directors, i.e. to their ability to find out better conditions on the debt market. With respect to NOLEND-BANK, the coefficient for LEND-BANK (-0.71) is higher including this term each of the effects - monitoring, certification, expertise - which may be associated to the roles played by lending bankers on boards.

In column (3) we concentrate on firms having lending bankers on their boards. BY-LENDER measures the reduction in risk premiums that these firms pay on loans granted by lenders on boards. The coefficient is equal to -0.72. BY-OTHER measures the reduction in risk premium these firms pay on loans granted by creditors without board positions. The coefficient is equal to -0.70, very close to the previous one. The reduced risk premium for BY-LENDER may reflect a reduction in information asymmetries between banks and firms due to the presence of a lender on boards (*monitoring hypothesis*). The reduced risk premium for BY-OTHER may reflect a certification effect provided by lending bankers on boards on the lending relationships between a firm and creditors which are outside the board.

In column (4), we verify whether the results are robust after controlling whether loans are pledged by real collateral. The coefficient is negative but not significant. All the previous results still hold.

Results for governance-information variables enable us to compare the impact on the cost of credit for each of the activities (*monitoring, certification, provision of expertise*) performed by bank directors. We established statistical significance for differences in coefficients associated with each of the roles, by setting up 95 per cent confidence intervals. We then, we carried out Wald tests on the significance of pairwise differentials (Tables 11-13). At the 95 per cent probability level, the impact on the cost of credit of LEND-BANK is statistically higher than the impacts of NOLEND-BANK. Furthermore, we find coefficients for BY-LENDER (*monitoring hypothesis*) statistically equivalent to those for BY-OTHER (*certification hypothesis)*, i.e. ceteris paribus, the terms of contracts applied by creditors with board positions in firms are aligned with those applied by creditors without board positions in the same firm.

We verify this result by running OLS regressions which include the bank-group level dummies instead of the bank-level ones. We also calculate the confidence intervals of the point estimates and perform Wald tests on the significance of the differences between pairs of estimated parameters. In Tables 12-13, we present the outcomes we obtained from these exercises. The results hold for each of the two (bank and group-level) set of dummies.

Traditional relationship characteristics. In Table 10 are displayed estimated coefficients for the control variables. Firms pay the TOP-LENDER bank 18 basis points less than they pay other lenders. Some effects arising from the cross-selling activity of main lenders are at work. The estimated parameter for LENGTH is 0.53. It means that a firm with an 11-year banking relationship is expected to pay an interest rate which is 1.27 percentage points (i.e., -0.53x(ln

11 - ln 1) higher than a firm with a 1-year relationship. Positive linkages between length of relationship and the relationship were found by Petersen and Rajan (1994), D'Auria et al (1997), and Degryse and Van Cayseele (2000). The coefficient for MULTIPLE is positive and equal to 0.07 percentage points. It means that firms which increase the number of creditors by 1 unit can expect to be charged 7 basis points more. The evidence on this issue is mixed. A positive relationship between number of lenders and cost of credit is established by Ferri et al (2000) and Petersen et al (1994) while it is negative as for the studies of Angelini et al (1998) and D'Auria et al (1997).

Firm's financial characteristics. In Table 10 we present control variables referring to firm's financial characteristics. Financial statements of firms are employed by creditors to predict borrowers' risk profiles. TANGIBILITY negatively affects interest rates. The estimated coefficient is equal to -0.55. Guiso (2007) finds out coefficients for the same variable ranging from -0.62 to -0.74. The coefficient for EQUITY/DEBT is negative (-0.44). Creditors ask for higher risk premiums for more leveraged customers. The coefficient estimated by Guiso (2007) is equal to -0.26. Larger firm size, represented by the log of SALES, lowers the cost of credit (-0.41). Guiso (2007) uses the log of the number of employees as a proxy for size and estimates a coefficient which is equal to -0.50. UNCOVERAGE positively affects interest rates: firms which have difficulty in meeting interest expense from their own cash flows are asked to pay higher risk premiums by creditors. D'Auria et al (1999) find similar results. More profitable companies are awarded lower interest rates by creditors, as the PROFITABILITY coefficient is negative and significant. Firms with higher liquid assets as a share of liquid liabilities (LIQUIDITY) signal a lower probability of financial distress. They are requested to pay lower risk premiums.

In a nutshell, we have three results. First, the cost of credit is lower for firms having bank directors on their boards. Second, as well as firms having a lender on boards are concerned, interest rates charged by creditors not represented on boards do not statistically differ from those charged by banks represented on boards. As the magnitude of the *certification* and *monitoring* effects are very similar we do not find evidence of a conflict of interest effect. On the contrary, our result is consistent with the 'information view' about the presence of banks' directors on firms' boards. The certification effect indicates that the lenders on boards are credible in certifying to the uninformed banks the ability of borrowers to repay the loans.

Third, firms with non lending bankers on board are charged a lower cost of financing compared to firms without bankers on boards. The reduction in risk premium is lower compared with that for firms having lending bankers on boards. We impute the reduction in the interest rates to the role played by non lending bankers on boards as financial expert (*expertise hypothesis*).

Our results seem to contrast with findings for Germany and Japan. In Italy, a firm with a bank presence on its board pays a lower interest rate than their peers. For Germany, Agarwal and Elston (2001) show that the cost of credit is significantly higher for firms having close ties with banks. As for Japan, Weinstein and Yafeh (1998) find the same results when they compare the cost of credit for bank-influenced firms to that of other firms. These studies conclude that the benefits of relationships between banks and firms are appropriated by the banks. In our study we show that outcomes of the relationships are returned to firms in the form of a lower cost of financing.

3.3 Robustness checks

Tables 14-17 show the results of regressions of interest rates on loans secured by accounts receivable (ACC/REC). The signs and significance of the coefficients (Table 14), as well as the significance of differences in effects for governance-information variables (Table 15-17), depict the same picture as regressions on credit lines data.

Regressions for term-fixed loans (not reported) show mixed evidence. The results are fully consistent with those exhibited by regression on credit lines and loans secured by accounts receivable only when the variable TRANCHE is neglected in the model. We need further research on this topic. At the moment we explain the results as for lines of credit (L/C) and secured by accounts receivable-loans (ACC/REC) as follows. By definition, L/C and ACC/REC are loans with a short-term maturity. The effects of bank presence on corporate boards are expected to be at work on short-term loans, the average tenure of firms' directors being equal to 3.5 years (Brunello et al, 2000). On the contrary, fixed-term loans include long-term maturity outstanding loans, which were granted a long while back. Effects arising from current bank presence on corporate boards are not expected to be at work for facilities extended a long time ago, as firms' managements were clearly different from today's.

4 Conclusions

A large literature studies the effects of the presence of bankers on firms' boards. First, lending bankers on boards may reduce monitoring costs, having access to borrowers' proprietary information (*monitoring hypothesis*); second, as informed creditors, lending bankers on boards may certificate the financial soundness of firms to other creditors which are not represented on their boards (*certification hypothesis*). According to an alternative view, lending bankers on boards may generate conflicts as they have incentives to pursue interests of both debtholders - as board's member of the banks - and firm's shareholders - as board's member of the firms, under the assumption that the pay-offs of these two groups are not aligned (*conflict of interests hypothesis*). Third, bank directors who have no relationship with the firm other than as a director may act as financial experts for the firms' management (*expertise hypothesis*).

We try to distinguish among the above mentioned hypotheses by studying the consequences of this banking presence on loan interest rates charged to firms.

As far as we know this is the first paper providing evidence on this subject.

In our study, the distinction between lenders on boards and lenders without board positions was drawn by taking into account group affiliation of banks.

Our analysis shows that interest rates loans from the bank with a director who is also a director of the borrowing firm are not significantly lower than those charged by other banks. Therefore, we do not find evidence of a conflict of interest effect.

In contrast, we find a significant certification effect supporting the information view. A lender on a corporate board reduces costs of monitoring of the bank represented on board and transmits good signals on the firm's creditworthiness to financiers which are outside the boardroom. Our evidence is in line with Boot (1992) who noted that contracts may have lower monitoring costs as a result of information produced through 'cross-monitoring' activities by other claimants.

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Table 6:
Summary statistics - Credit lines
(Loans-level data employed in Credit Lines regressions)

Variable	Mean	Std. Dev.	Min.	Max.	N
C/L	8.051	3.049	0	16.629	86,858
TRANCHE	286,165	6,396,933	1	1,319,996,288	86,858
MULTIPLE	6.887	3.518	1	33	86,858
COLLATERAL	0.027	0.162	0	1	86,858
LENGHT	6.926	3.625	1	11	80,108
TANGIBILITY	0.239	0.306	0	1.636	84,592
PROFITABILITY	4.463	13.995	-41.2	55.2	76,353
UNCOVERAGE	0.739	0.24	0	1	81,641
LIQUIDITY	1.109	0.36	0	2.749	85,014
SALES	41,760	360,916	0	17,266,480	78,304
EQUITY/DEBT	0.509	0.541	0	3.47	77,563

Table 7:
Summary statistics - ACC/REC
(Loans-level data employed in ACC/REC regressions)

Variable	Mean	Std. Dev.	Min.	Max.	N
ACC/REC	3.969	1.596	0	16.502	120,850
TRANCHE	530,063	1,479,431	1	177,244,176	120,850
MULTIPLE	6.88	3.365	1	33	120,850
COLLATERAL	0.009	0.096	0	1	120,850
LENGHT	7.113	3.576	1	11	112,100
TANGIBILITY	0.249	0.311	0	1.638	119,812
PROFITABILITY	5.572	14.049	-41.2	55.16	109,595
UNCOVERAGE	0.749	0.23	0	1	116,292
LIQUIDITY	1.17	0.326	0	2.749	119,563
SALES	28,813	118,780	0	17,266,480	109,537
EQUITY/DEBT	0.551	0.571	0	3.467	110,240

Table 8:
Summary statistics - F/TERM
(Loans-level data employed in F/TERM regressions)

Variable	Mean	Std. Dev.	Min.	Max.	N
F/TERM	3.987	1.341	0	16.591	96,835
TRANCHE	1,744,991	14,203,103	1	2,163,180,032	96,835
MULTIPLE	6.746	3.75	1	33	96,835
COLLATERAL	0.182	0.386	0	1	91,124
LENGHT	7.211	3.533	1	11	88,834
TANGIBILITY	0.275	0.332	0	1.638	93,844
PROFITABILITY	5.46	13.666	-41.2	55.18	88,494
UNCOVERAGE	0.666	0.265	0	1	91,218
LIQUIDITY	1.17	0.397	0	2.75	93,929
SALES	52,196	427,533	0	17,266,480	84,222
EQUITY/DEBT	0.591	0.595	0	3.468	86,619

Table 9: Interest rates by type of bank's presence on firm's boards
(Cost of credit in percentage points)

	Firms with a bank director on company boards				
	No	Yes			
			Non lending banker	Lending banker	
				Loans from other lenders	Loans from lenders on boards
			(expertise)	(certification)	(monitoring vs conflict)
CREDIT LINES	8.09	6.89	7.21	6.65	5.93
ACC-REC	3.99	3.45	3.56	3.29	3.33
TERM LOANS	4.00	3,69	3.78	3.60	3.57

Table 10: Determinants of the rate of interest on credit lines

Bank-firm level data are employed. The definition of variables can be found in Table 2. Each regression also include a constant, 23 economic branch dummies, 20 local market dummies, 213 credit institutions dummies. LENGHT is the natural log of one plus the length of the relationship. t statistics are reported in brackets. Robust Huber-White standard errors are computed. Clusters are fixed at bank-level. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Dependent var: C/L	(1)	(2)	(3)	(4)
Contract characteristics				
TRANCHE	-0.142***	-0.142***	-0.142***	-0.141***
	(-3.83)	(-3.83)	(-3.83)	(-3.83)
COLLATERAL				-0.205
				(-1.39)
Governance-information characteristics				
BANK	-0.487***			
	(-9.02)			
NOLEND-BANK		-0.351***	-0.351***	-0.350***
		(-5.22)	(-5.22)	(-5.22)
LEND-BANK		-0.711***		
		(-8.78)		
BY-OTHER			-0.708***	-0.709***
			(-6.98)	(-6.98)
BY-LENDER			-0.724***	-0.724***
			(-4.36)	(-4.37)
Traditional relationship characteristics				
TOP-LENDER	-0.188***	-0.189***	-0.189***	-0.184***
	(-5.42)	(-5.43)	(-5.44)	(-5.22)
MULTIPLE	0.0778***	0.0780***	0.0780***	0.0774***
	(12.67)	(12.70)	(12.72)	(12.42)
LENGHT	0.536***	0.536***	0.536***	0.536***
	(9.29)	(9.28)	(9.28)	(9.30)
Firm's financial characteristics				
TANGIBILITY	-0.557***	-0.556***	-0.556***	-0.558***
	(-9.46)	(-9.41)	(-9.41)	(-9.44)
PROFITABILITY	-0.00720***	-0.00719***	-0.00719***	-0.00712***
	(-6.48)	(-6.48)	(-6.48)	(-6.30)
UNCOVERAGE	0.256***	0.256***	0.256***	0.254***
	(4.17)	(4.16)	(4.17)	(4.20)
LIQUIDITY	-0.509***	-0.510***	-0.510***	-0.510***
	(-9.11)	(-9.14)	(-9.14)	(-9.15)
SALES	-0.492***	-0.492***	-0.492***	-0.492***
	(-12.18)	(-12.18)	(-12.18)	(-12.23)
EQUITY/DEBT	-0.445***	-0.444***	-0.444***	-0.446***
	(-16.53)	(-16.57)	(-16.57)	(-16.61)
PUBLIC	-0.844	-0.828	-0.829	-0.834
	(-1.69)	(-1.67)	(-1.67)	(-1.68)
Observations	57,136	57,136	57,136	57,136
R^2	0.35	0.35	0.35	0.35

Table 11: Confidence intervals - C/L Regressions (bank-level dummies)

(Point estimates and 95 percent confidence intervals in brackets)

	(1)	(2)	(3)	(4)
Governance-information characteristics				
BANK	-0.487***			
	[-0.593,-0.380]			
NOLEND-BANK		-0.351***	-0.351***	-0.350***
		[-0.483,-0.218]	[-0.483,-0.218]	[-0.483,-0.218]
LEND-BANK		-0.711***		
		[-0.871,-0.551]		
BY-OTHER			-0.708***	-0.709***
			[-0.908,-0.508]	[-0.909,-0.508]
BY-LENDER			-0.724***	-0.724***
			[-1.051,-0.396]	[-1.052,-0.397]
Observations	57,136	57,136	57,136	57,136
R^2	0.35	0.35	0.35	0.35

95% confidence intervals in brackets

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 12: Confidence intervals - C/L Regressions (bank-group level dummies)

(Point estimates and 95 percent confidence intervals in brackets)

	(1)	(2)	(3)	(4)
Governance-information characteristics				
BANK	-0.483***			
	[-0.578,-0.387]			
NOLEND-BANK		-0.338***	-0.338***	-0.338***
		[-0.458,-0.219]	[-0.458,-0.219]	[-0.457,-0.218]
LEND-BANK		-0.721***		
		[-0.881,-0.560]		
BY-OTHER			-0.700***	-0.701***
			[-0.900,-0.500]	[-0.902,-0.500]
BY-LENDER			-0.808***	-0.809***
			[-1.171,-0.445]	[-1.173,-0.445]
Observations	57,136	57,136	57,136	57,136
R^2	0.29	0.29	0.29	0.29

95% confidence intervals in brackets

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 13: Significance of differences in impacts - C/L Regressions

(Wald test for significance of differences on estimated coefficients)

	Bank-level dummies			Bank group-level dummies		
	(2)	(3)	(4)	(2)	(3)	(4)
$\beta_{NOLEND-BANK} \neq \beta_{LEND-BANK}$	YES			YES		
$\beta_{NOLEND-BANK} \neq \beta_{BY-OTHER}$		YES	YES		YES	YES
$\beta_{NOLEND-BANK} \neq \beta_{BY-LENDER}$		YES	YES		YES	YES
$\beta_{BY-OTHER} \neq \beta_{BY-LENDER}$		NO	NO		NO	NO

Table 14: Determinants of the rate of interest on loans secured by accounts receivable

Bank-firm level data are employed. The definition of variables can be found in Table 2. Each regression also include a constant, 23 economic branch dummies, 20 local market dummies, 213 credit institutions dummies. LENGHT is the natural log of one plus the length of the relationship. t statistics are reported in brackets. Robust Huber-White standard errors are computed. Clusters are fixed at bank-level. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

	(1)	(2)	(3)	(4)
Contract characteristics				
TRANCHE	-0.0560***	-0.0560***	-0.0560***	-0.0566***
	(-6.25)	(-6.25)	(-6.25)	
COLLATERAL				0.841***
				(15.87)
Governance-information characteristics				
BANK	-0.213***			
	(-6.67)			
NOLEND-BANK		-0.165***	-0.165***	-0.166***
		(-4.77)	(-4.77)	(-4.83)
LEND-BANK		-0.290***		
		(-6.20)		
BY-OTHER			-0.295***	-0.293***
			(-5.68)	(-5.69)
BY-LENDER			-0.269***	-0.270***
			(-3.49)	(-3.55)
Traditional relationship characteristics				
TOP-LENDER	0.0173	0.0173	0.0172	0.0110
	(0.87)	(0.86)	(0.86)	(0.55)
MULTIPLE	0.0279***	0.0280***	0.0280***	0.0286***
	(7.99)	(7.99)	(7.99)	(8.18)
LENGHT	0.129***	0.129***	0.129***	0.129***
	(5.72)	(5.72)	(5.72)	(5.75)
Firm's financial characteristics				
TANGIBILITY	-0.367***	-0.367***	-0.367***	-0.364***
	(-13.86)	(-13.83)	(-13.83)	(-13.74)
PROFITABILITY	-0.00677***	-0.00676***	-0.00676***	-0.00681***
	(-14.20)	(-14.20)	(-14.21)	(-14.46)
UNCOVERAGE	-0.000729	-0.000412	-0.000411	0.000220
	(-0.03)	(-0.02)	(-0.02)	(0.01)
LIQUIDITY	-0.419***	-0.419***	-0.419***	-0.416***
	(-13.92)	(-13.92)	(-13.92)	(-13.94)
SALES	-0.414***	-0.414***	-0.414***	-0.413***
	(-22.62)	(-22.59)	(-22.60)	(-22.87)
EQUITY/DEBT	-0.261***	-0.261***	-0.261***	-0.257***
	(-25.52)	(-25.54)	(-25.52)	(-25.10)
PUBLIC	-0.0558	-0.0564	-0.0563	-0.0464
	(-0.23)	(-0.23)	(-0.23)	(-0.19)
Observations	8,4434	8,4434	8,4434	8,4434
R^2	0.23	0.23	0.23	0.24

Table 15: Confidence intervals - ACC/REC Regressions (bank-level dummies)

(Point estimates and 95 percent confidence intervals in brackets)

	(1)	(2)	(3)	(4)
Governance-information characteristics				
BANK	-0.213*** [-0.276,-0.150]			
NOLEND-BANK		-0.165*** [-0.234,-0.0968]	-0.165*** [-0.234,-0.0968]	-0.166*** [-0.234,-0.0982]
LEND-BANK		-0.290*** [-0.383,-0.198]		
BY-OTHER			-0.295*** [-0.398,-0.193]	-0.293*** [-0.394,-0.191]
BY-LENDER			-0.269*** [-0.422,-0.117]	-0.270*** [-0.420,-0.120]
Observations	84434	84434	84434	84434
R^2	0.233	0.233	0.233	0.235

95% confidence intervals in brackets

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 16: Confidence intervals-ACC/REC Regress.(bank group-level dummies)

(Point estimates and 95 percent confidence intervals in brackets)

	(1)	(2)	(3)	(4)
Governance-information characteristics				
BANK	-0.220*** [-0.286,-0.153]			
NOLEND-BANK		-0.171*** [-0.251,-0.0906]	-0.171*** [-0.251,-0.0906]	-0.172*** [-0.251,-0.0922]
LEND-BANK		-0.299*** [-0.393,-0.206]		
BY-OTHER			-0.298*** [-0.405,-0.191]	-0.296*** [-0.402,-0.190]
BY-LENDER			-0.305*** [-0.434,-0.176]	-0.306*** [-0.433,-0.179]
Observations	84,434	84,434	84,434	84,434
R^2	0.22	0.22	0.22	0.22

95% confidence intervals in brackets

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 17: Significance of differences in impacts - ACC/REC Regressions

(Wald test for significance of differences on estimated coefficients)

	Bank-level dummies			Bank group-level dummies		
	(2)	(3)	(4)	(2)	(3)	(4)
$\beta_{NOLEND-BANK} \neq \beta_{LEND-BANK}$	YES			YES		
$\beta_{NOLEND-BANK} \neq \beta_{BY-OTHER}$		YES	YES		YES	YES
$\beta_{NOLEND-BANK} \neq \beta_{BY-LENDER}$		NO	NO		YES	YES
$\beta_{BY-OTHER} \neq \beta_{BY-LENDER}$		NO	NO		NO	NO

Figure 1: Effects of *lending* bank directors on boards on lender-borrower relationships.

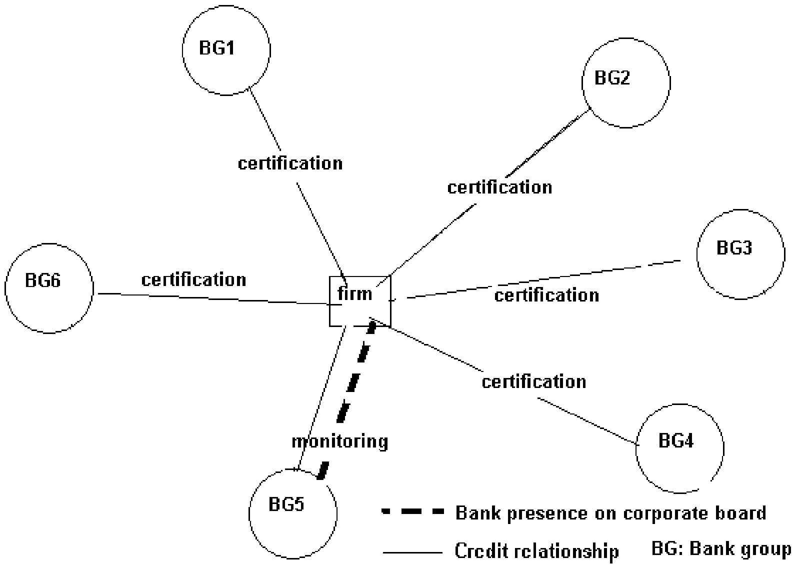
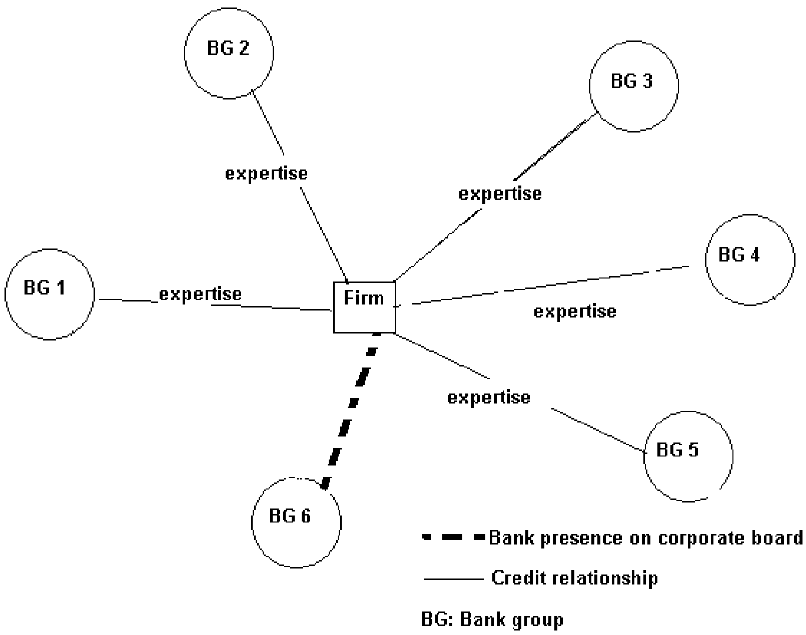


Figure 2: Effects of *non-lending* bank directors on boards on lender-borrower relationships.



What's risk got to do with it?

An analysis of interest rates in the Italian consumer credit market *

Abstract

In this paper, we investigate the determinants of interest rates on consumer credit in the Italian market. The analysis is stimulated by the high level of Italian rates in a comparison with the euro-area and by the fact that this differential is not fading away with the strong growth of the Italian market, contrary to what one could expect. Although a full-fledged analysis of cross-country differentials cannot be carried out due to limited data availability and we have to focus on the determinants of Italian rates alone, our results suggest that Italian rates are strongly influenced by concentration levels. Risk is less significant as a determinant of interest rate, especially for those banks situated in the upper half of the distribution of interest rates.

* This paper was written jointly with Matteo Piazza (Bank of Italy). The views expressed here do not involve the responsibility of the Bank of Italy.

1. Introduction

The consumer credit market in Italy experienced spectacular growth during the last few years, almost trebling in volume between 2000 and 2006 and significantly enlarging the range of products available to consumers (Mercer-Oliver-Wyman, 2005)[1]. The cost of this credit, however, came under scrutiny from several quarters. The media, consumers' associations and policymakers, repeatedly pointed out that costs are high and hinted that price conditions might not be justified by the characteristics of the borrowers. Asked in an interview about government's plans on economic liberalizations, a deputy Economy Minister was quoted as saying "*I started an inquiry over consumer credit, a sector that is rapidly growing but where costs are very high. As a first step, I'm collecting evidence to understand the costs of each type of consumer credit.*" (Roberto Pinza, "Il Mattino", 2/2/2007).

There may be something in these complaints: according to data collected in compliance with the usury law, the average effective rate on instalment and revolving loans up to 5,000 euros in the third quarter of 2006 was above 16 per cent; the rate on personal loans, instalment and revolving loans over 5,000 euros was above 10 per cent. Rates applied by non banking intermediaries were even higher. In the same period, the main policy rate of the European System of Central Banks was 2.75 per cent (3 per cent since mid-October 2006) and the non-performing loans ratio for consumer credit was only 1.7 per cent in December 2006 for banks[2]. Comparisons with the euro area convey a similar message; as we illustrate in more detail in paragraph 2, Italian rates are remarkably higher than those prevailing in most member states.

In this paper, we address this issue, trying to shed some lights on the determinants of interest rates on consumer credit in Italy. As far as we know, there have been almost no attempts to investigate this topic, perhaps due to the small size of this market until a few years ago and to the fact that data on the pricing of consumer loans were (and, partly, still are) scarcely available. Bertola et al. (2005), which is the most comprehensive study of the pricing of consumer credit in Italy to our knowledge, draw on a proprietary database of a leading intermediary (relative to the years 1995-1999) to carry out their analysis. They report that interest rate variability is mostly accounted for by time, region and type of item purchased, plus a limited number of contract characteristics[3].

[1] This international consultancy classified Italy in a report on consumer credit among the countries with "high level of innovation, competition and liberal regulation supporting high growth".
[2] Values for the other financial intermediaries are higher, around 3 per cent (Cau-Salvio, 2007).
[3] They also found that "variables that relate to the individual loan applicant are much less relevant" (Bertola et al, 2005).

For most of these breakdowns, however, there are still no publicly available statistics on interest rates, significantly hampering the scope of the analysis. The first example of a missing breakdown that springs to mind is the distinction between targeted loans (i.e. loans intended to finance the purchase of a specific good or service)[4] and personal loans, a distinction on which we will further elaborate below. While this work fully suffers these limitations, we will try to take these aspects into account as much as possible.

The structure of the paper is as follows: in section 2, we compare Italian interest rates with those prevailing in the euro area, as this provides a natural benchmark against which to evaluate their level. This comparison shows that domestic rates on consumer credit do not seem to be converging to the euro area level. This suggests that it may be worthwhile to look in more detail into their national determinants: in section 3, we selectively review the literature on the Italian consumer credit market and we then provide an analysis of some characteristics that may matter for interest rates determination. In section 4, we illustrate our dataset, our empirical strategy and the results of our econometric analysis. Section 5 concludes.

2. A European benchmark

Comparing interest rates across Europe has become easier since the introduction of harmonised interest rates statistics in January 2003[5]. According to these data, Italian interest rates on consumer credit have consistently been above the euro area average (figure 1), a difference hovering around two percentage points during the four years 2003 - 2006. Interest rates differentials for other categories of loans are much smaller: in the second half of 2006, average differentials between Italy and the euro area in interest rates applied to new loans to non financial corporations and for house purchases were as low as 7 and 22 basis points, respectively. In the same period, the differential on consumer credit interest rates applied to new business was still 174 basis points[6]. According to Gobbi (2006), a possible explanation is that banks willing to enter the consumer credit market face fixed costs that are difficult to sustain in a small-sized market like Italy (table 1). This creates substantial barriers to entry, hampering potential competition and driving up prices. Consistent with

[4] Targeted loans are also known as purpose or point-of-sale loans. A description of the different types of consumer credit products in Italy is in Cau-Salvio (2007).

[5] Harmonised statistics on interest rates (MIR statistics) concern interest rates applied by monetary financial institutions (MFIs) to euro-denominated deposits and loans vis-à-vis households and non-financial corporations. For a comprehensive description of these data, one may see the ECB Regulation 2001/18 and the MIR Manual available on the ECB website.

[6] According to the mentioned report by Oliver-Mercer-Wyman (2005) "spreads in less mature, fast growing countries like Turkey and Italy are at least twice the level of those in more mature markets like France and Germany".

this explanation, he reports a negative correlation between interest rates and per-capita business volumes across euro area countries. Cross-country differences in market size may also affect the relative level of the interest rates if intermediaries in countries with larger consumer credit markets may take better advantage of economies of scale and had more opportunities of adopting new technologies, reducing their costs and risks.

In this perspective, one would expect that the remarkable expansion of the Italian consumer credit market – which led the country to double its share of the euro area market, between 1999 and 2006, from 4 per cent to 8 per cent (table 2) - would start denting interest rate differentials. Likewise, as intermediaries have been upgrading their instruments and adopting better practices in the last few years (Mercer-Oliver-Wyman, 2005), one would expect a beneficial effect on costs and risk and, on turn, on prices.

Figure 2, however, reports the Annual Percentage Rate of Charge (APRC)[7] for consumer credit for all countries members of the euro area for two sub-periods (Jan 2003- Jun 2005; Jul 2005- Nov 2006). Figures 1 and 2 together show that Italian rates are well above the European average (only Greece and Portugal have higher interest rates than Italy) and that relative positions among European countries remained basically unchanged in the two sub-periods[8]. The three Southern European countries, featuring the highest rates in the euro area in January 2003, had their spreads with the rest of the area slightly reduced over time but their rates remained remarkably higher also in the second sub period[9]. As also Greece had much higher rates of growth in the period than the rest of the area (table 2), this may cast some doubts over the idea that the development of the market would quickly translate in a lower level of interest rates. Mercer-Oliver-Wyman (2005) argue that "the cost of consumer credit has declined even further [than other categories …] as a result of increased competitive pressures. This has happened more quickly in fast-growing, competitive markets: in Italy, for example, prices (APRC) have dropped by 10% per year". We found, however, no evidence of such a drop in interest rates in harmonised statistics. The Italian APRC has fallen 120 basis points *in the four years* since January 2003, starting from a level around 10.7 per cent per annum and the picture does not change radically if one takes into account movements of official rates.

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[7] The annual percentage rate of charge (APRC) is "an effective lending rate that covers the total costs of the credit to the consumer, i.e. the interest payments as well as all other related charges." (ECB, 2003).

[8] Only The Netherlands and Belgium changed their relative positions, in the middle of the ranking.

[9] Loans for house purchases and to non financial corporations actually worsened their differentials: in the second half of 2003 Italian rates were actually lower, in these categories, than euro area averages (by about 30 basis points).

A more formal analysis suggests similar conclusions. In a recent paper, Affinito-Farabullini (2006) investigate convergence in interest rates across the euro-area as a way to evaluate integration in retail banking markets, and report some results that are of interest for this paper. The authors assess the homogeneity of interest rates across euro area countries by means of two approaches. The first is based on a test applied to the bilateral differential δ_{tij} between the interest rates of each pair of countries: $\delta_{tij} = r_{t,i} - r_{t,j}$. The authors argue that two countries have homogeneous interest rates when the interest differential δ_{tij} between them is a zero-mean stationary process. They preliminarily verify the stationarity of the differential using the Augmented Dickey-Fuller test and, then, the KPSS (Kwiatkowski-Phillips-Schmidt-Shin) test to control for the zero-mean stationarity of δ_{tij}.

The second approach is based on testing the equality of estimated country coefficients in each interest rate category and verifying the statistical significance of bilateral differentials. A first specification only includes time (T) and binary country dummies (D). Then, the authors use $r_{it} = \alpha'_t T_{it} + \beta' i\, D_{it} + \gamma' X_{it} + \delta' Z_{it} + \varepsilon_{it}$ where the equality of country coefficients is tested, first, employing only the "demand side" covariates ($X_{i,t}$)[10] and then testing the equality of the country coefficients resulting from the general specification with both "demand" (X) and "supply" (Z) covariates.

We report in the box below the results of their exercise (spanning the period January 2003 – August 2005) which are of interest for this paper[11]. We select the eleven bilateral differentials for the Italian interest rates on consumer lending (i.e. we omit bilateral differentials related to countries other than Italy or interest rates categories different from consumer credit). The first column reports the results for the KPSS exercise: the fact that no differentials are found to be insignificantly different from zero suggests that, at least as far as unconditional outcomes are considered, differences in interest rates are for real. In the following columns, covariates are added to take into account country-specific characteristics. This makes Italian rates slightly more in line with those of other countries. However, it is noteworthy that the closest country is, apparently, Portugal, i.e. a country with a higher average interest rate.

[10] "Demand" side covariates are factors influencing interest rate setting behaviour related to the characteristics of bank depositors and borrowers (households' disposable income; an indicator of alternative financial saving; an indicator of alternative sources of financing and the average firm size). "Supply side" covariates are determinants of rates that depend on banking system characteristics (both market-wide and individual characteristics: bank international presence, banking market concentration, bank average size and bank mergers and acquisitions, bank operating costs, bank non-interest income, bank liquidity, bank capitalization, bank liability structure, and bank asset structure).

[11] We thank the authors for kindly providing us with their results.

	KPSS	Time and country dummies	Demand	Demand and supply
Number of bilateral differentials not significantly different from zero (out of 11 bilateral differentials)	0	2 (IE, PT)	1 (PT)	5 (BE,GR,IE, LU,PT)

Even taking into account national characteristics, therefore, no convergence of Italian consumer credit rates to the euro area average seems to be underway[12]. But if differentials are not going to fade away quickly, it may be worthwhile to look at them in some more details.

A tentative estimate of the determinants of the APRC spread between Italy and the rest of the area in 2005 was put forward in the Annual Report of the Bank of Italy (Bank of Italy, 2006). According to it, " *.. the APRC on consumer credit from banks in Italy fell by 0.5 percentage points to 9.1 per cent, but there was still a large differential by comparison with the euro area average of 7.4 per cent. Part of the disparity (0.6 percentage points) was due to intermediaries specializing in lending through retailers with which they have agreements, which usually charge additional fees; these intermediaries hold about one third of the banking market. The remainder of the differential can probably be ascribed to structural factors: the relatively small size of the market, which prevents economies of scale from being fully exploited; agreements with large distribution firms, which may restrict the entry of new competitors to the market in targeted credit; the smaller proportion of personal loans, which are cheaper than targeted credit as they involve a more direct relationship between the intermediary and the customer*."

While this quotation well summarizes the likely determinants of the existing differentials, the underlying exercise comes up against some difficulties. In fact, it attributes 60 basis points of the differential vis-à-vis the euro area to specialized intermediaries, by excluding them from the computation of the Italian rate, but a similar correction cannot be done on the other European countries, because of data availability, and it is not clear *prima facie* what would be its effect on the spread.

[12] The analysis by Affinito-Farabullini does not evaluate whether the spreads in the cost of credit have been reducing over time. We provided some descriptive evidence that this does not seem to be the case for Italy but we are not aware of any paper specifically focused on this issue. The only analysis of in-process convergence type that make use of harmonised data finds a negative statistically significant trend in the dispersion of the consumer credit interest rates (Vajanne, 2006). The exercise deals with convergence in-process for the euro area as a whole (for each product, *b-convergence* coefficients are constrained to be equal among countries) and does not provide any clues about individual countries.

These difficulties are far from being specific to that exercise, however, and illustrate the obstacles in carrying out a cross-country analysis. We tried to find out what is the relative share of targeted and non targeted loans in each country, as this share may affect cross-country spreads if interest rates are substantially different between these two types of consumer credit[13]. The sign of this difference, however, it is not clear, however, as Bertola et al. (2005) provide some evidences that targeted loans are cheaper while Banca d'Italia, 2006, suggests the opposite, as made clear by the quotation above. Unfortunately, systematic cross-country data on the proportion between targeted and non targeted loans are not available, as we found out surveying the members of the *Working Group on Monetary, Financial Institutions and Markets Statistics* of the European System of Central Banks. From the sparse evidence we were able to gather, however, targeted loans may range from 6 per cent of the total for French banks to 20 per cent in Greece to over half in Italy[14].

Before moving to the next paragraph, we carried out a further decomposition, by maturity, of the existing APRC differential with the euro area. In fact, *if* (i) the term structure of interest rates is positively sloped in every country, and (ii) the preferences for maturity classes are different among countries regardless of the interest rates prevailing in each class, this combination could be enough to generate differentials in the APRC, as this interest rate aggregates data across three different maturity classes.

As harmonised statistics include a breakdown by three interest rate fixation (IRF) periods for the annualised agreed rates (AAR[15]), we investigate this hypothesis. Data broken down by IRF periods (figure 3) do not lend it too much of a support, as the ranking of interest rates is quite heterogeneous across countries. For 5 out of 11 countries examined[16], the most expensive class is "over 5 years", for three is "up to 1 year" and for three "over 1 and up to 5 years".

[13] One may wonder why this should be the case if both types of loan satisfy the desire for consumption smoothing that should be at the root of credit demand. The quotation in the following footnote suggests that cultural attitudes toward debt could play a role.

[14] Oliver - Mercer – Wyman (2005) suggest that "auto loans and point-of-sale credit [what we call here targeted credit] tend to be the first to be supplied, as they are easy to fund and easy for consumers to understand. Later, generic personal lending grows in importance as the supply-side responds to incentives to use their customer databases to cross-sell personal lending products and consumers become willing to accept them"

[15] The annualised agreed rate is defined in paragraph 1 of Annex II to the Regulation as 'the interest rate that is individually agreed between the reporting agent and the household or non-financial corporation for a deposit or loan, converted to an annual basis and quoted in percentages per annum. The annualised agreed rate shall cover all interest payments on deposits and loans, but no other charges that may apply. The initial period of fixation is defined as a predetermined period of time at the start of a contract during which the value of the interest rate cannot change. The initial period of fixation may be smaller or equal to the original maturity of the loan.

[16] Data for the Netherlands are missing.

Figure 4 breaks down the spread of Italian new business rates vis-à-vis the euro area average by IRF categories. Italian interest rates are similar for long – term loans (over 5 years) and significantly higher for short term loans (up to 1 year). Due to the small volumes in the latter category, however, the overall spread mirrors, almost perfectly, the spread on the medium term loans (over 1 and up to 5 years).

To wrap up, in this paragraph we found no indications either that Italian interest rates on consumer credit are converging to the euro area average or that the existing differential simply reflect composition effects, although we cannot entirely rule them out, in particular as far as the role of targeted and non targeted loans is concerned. To carry out a full-fledged analysis of the determinants of interest rates differentials among countries, however, we should be able to control for all the factors[17] that affect interest rates levels. Lacking cross-country data on several relevant variables, we focused our empirical analysis on the determinants of the level of Italian interest rates, leaving aside the issue of whether they are also driving differentials vis-à-vis other countries.

3. The Italian consumer credit market

3.1. A review of some recent literature on the Italian consumer credit market

Several recent papers provide a comprehensive description of the main characteristics of the market (Barone et al., 2006; Casolaro, 2006; Cau-Salvio, 2007; Gobbi, 2006). While the focus of those contributions is on volumes rather than on prices, they nonetheless provide a useful overview of the market and it is worthwhile to briefly recall their main findings.

A first element underlined by most papers is the small size of the Italian market in comparison with other developed economies. This is true both as a share of the Gross Domestic Product, as a share of the total lending to households and, if we restrict the comparison to the euro area, as a share of the EU-12 market (Barone et al., 2006). Some tentative explanations for this underdevelopment are put forward by Gobbi (2006) and Barone et al. (2006). The former author does not focus specifically on this issue but mentions the low debt propensity of Italian households, fuelled by historical factors as the high level of interest rates for most of the past decades, the high saving rate and the backwardness of significant part of the banking system, as a main driver of this underdevelopment. Additional factors explaining the thinness of the market were the significant

[17] The most obvious example is the level of risk associated to households in different countries. If Italian households were much more delinquent on their payments than their European counterparts, higher interest rates would be a natural consequence of this situation.

intergenerational transfers taking place within families - which were an effective substitute for consumer credit - and the cultural stigma that was still associated with debt in an economy that was predominantly agricultural until sixty years ago. Adding to this list, Barone et al. (2006) put some emphasis on public debt that tended to crowd out private debt until a few years ago.

The diminishing importance of some of these factors gave impulse to the growth of household debt, a phenomenon widely shared in advanced countries in recent years and basically due to falling real interest rates and to the related rise in housing wealth. According to Gobbi (2006), the spectacular growth of consumer credit in Italy in the last few years (table 2) has to be traced back more to medium term trends on household wealth, costs and credit availability rather than to short term fluctuations on income and consumption that would have forced households to run into debt. This growth has not been enough, however, for Italy to catch up with most industrialized countries where household debt remains significantly higher.

While the initial underdevelopment and the recent growth are stylized facts that apply, more or less, across all the Italian economy, there are nonetheless significant differences among regions and this variability is the focus of both Barone et al. (2006) and Casolaro (2006). The former paper analyzes the regional distribution of consumer credit, comparing it with the distribution of the overall household debt. It turns out that densities across regions are different between the two distributions and that demand side variables are much more important for consumer debt than for the overall household debt. For the latter, supply-side variables such as the efficiency of the judiciary are much more important (possibly explained by the higher average amount of each loan).

Consumer credit (as a ratio over GDP) is higher in the Centre and the South of the country, the opposite of the pattern for the overall household debt, and the ratio takes on a wide range of values, going from 2 per cent in Trentino to 8.7 per cent in Sardinia. Also, unlike total household debts, consumer lending has similar per capita values in the Centre-North of the country (1,249 euro) and in the South (1,274 euro). The authors also find that consumer credit is more widespread in provinces (i) with lower income; (ii) where income distribution is more unequal and (iii) where retail sales by large establishments are more significant. This last finding is also the theme of a paper by Casolaro (2006), who starts from the observation that there are significant differences in consumer credit diffusion even among provinces with a similar level of economic and financial development. He shows that large-scale retail trade determines, *ceteris paribus*, a higher level of consumer lending. Consistently with Barone et al. (2006), he finds that the level of provincial wealth is negatively correlated with consumer lending and that judicial efficiency is not correlated with consumer credit. He also finds, however, that social capital contributes to the development of the market, by raising credit supply.

Gobbi (2006) analyzes individual data from the Survey on Household Income and Wealth 2004, showing that the use of consumer credit increases in household income, a result different from that reported by Barone et al. (on the basis of data aggregated at provincial level). He also shows that consumer debt depends on the age of the head of the households and it is concentrated in the age class between 25 and 50 years. Finally, as already mentioned, he suggests tentatively that cost differentials with other European countries could be due to the small size of the Italian market. In this perspective, market growth (caused, for example, by financial innovation or from the diffusion of large-scale retail shops) could have a positive impact, by triggering economies of scale and enhancing incentives to entry.

Bertola et al. (2005) offer some interesting evidences about the pricing of consumer credit but the focus of their study is what lies behind the fact that dealers of durable consumer goods typically pay (part of) the interest to the intermediaries and why these arrangements may dominate situations in which consumers directly borrow from banks or simply pay cash. They argue that prices can differ between cash and credit because of price discrimination opportunities arising from financial market imperfections. A dealer can generate additional demand for his product when distinct groups of consumers are inclined to purchase on cash and on credit terms. Bertola et al. show that this sort of market segmentation can explain not only the existence of dealer-subsidized consumer credit, but also its heterogeneous incidence as observed in the proprietary database they analyze. They recognize, however, that agreements between dealers and intermediaries do not necessarily imply dealers' subsidization but may also generate finders' fee for the dealers, depending on market situations[18].

Finally, a paper by Bičáková (2007) analyzes different types of consumer credit from the point of view of their risk. Using the same proprietary database analyzed by Bertola et al., she finds that default rates on instalment loans vary with the type of good purchased and inquires whether variations in default rates across different types of goods, controlling for individual characteristics and selection bias, are due to unobserved individual heterogeneity or to the effect of the specific characteristics of the good. She finds that most of the variation is explained by the former effect: individuals who buy motorcycles on credit are more likely to default on any loans, while those

[18] "In some segments of the Italian data set we analyze, banks may pay fees to dealers, but information on incidence of that phenomenon is not available to us" (Bertola et al., 2005).

buying kitchen appliances, furniture and computers are more likely to repay. In her dataset, default rates vary from 2.2 for cars to 3.7 for white goods and furniture to 6.9 for motorbikes to 10 per cent for telecommunication.

3.2. Some additional statistics on the Italian consumer credit market

The contributions just summarized provide an overview of several important features of the market but do not provide any discussion (with the partial exceptions of Bertola et al. and Gobbi) of factors that could affect interest rates. In this paragraph, therefore, we briefly summarize some statistics that could be relevant in this regard.

Some 651 banks and 56 financial intermediaries operate in the consumer credit market[19] as of December 2006 but for most banks consumer credit is a relatively marginal activity (for 97 per cent of the population, it is less than 10 per cent of the loan portfolio; for 92 per cent, less than 5 per cent)[20]. Complementing this evidence and suggesting that consumer credit is an area where specialized banks play a major role, the four banks with a ratio between consumer credit and total loans above 0.75, controlled 36 per cent of the market as of December 2006.

Concentration is higher than for total assets. The *Report on EU Banking Structure* (ECB, 2006) shows a Herfindahl index for total assets in Italy equal to 230, among the lowest in Europe, and a CR5 index (the market share of the first five banks) equal to 26.7 per cent. The same indexes for Italian consumer credit are respectively 670 and 49 per cent.

Risk is traditionally considered a main driver of interest rates on loans but bad loans on Italian consumer credit are under 2 per cent for banks and 3 per cent for the other financial intermediaries, according to the prudential statistical returns with reference to end-2006. This level seems apparently too low to explain significantly the level reached by interest rates on consumer credit, even considering that prices are based on *ex-ante* risk and we are summarizing an *ex-post* measure.

Costs seem equally unlikely to be a main factor behind interest rate variability. Overall costs should also affect other types of loans and we already mentioned as, at least in a European comparison, Italian rates on loans different from consumer credit are not significantly higher than abroad. Similarly, costs related uniquely to consumer lending are unlikely to be the culprits: table 3

[19] The consumer credit market includes such items as personal loans, instalment loans, revolving credit card, etc. An item that is not considered in the definition of consumer credit are overdrafts by consumer households.
[20] The ratio between consumer credit and total loans (excluding interbank loans) is below 4 per cent as of end-2006.

shows that higher prices are associated with greater volumes and this is scarcely consistent with the idea that interest rates are mainly driven up by fixed costs.

In fact, we examined the Italian APRC distribution and we associated to each quintile the average volume of operations made by banks in that quintile. If high interest rates are a reflection of a widespread immaturity of the market (in terms of practices and products), this should equally affect large and small banks and we should not find any specific pattern linking volume and interest rate quintiles[21]. If high interest rates were motivated by a problem of size and, accordingly, by economies of scale restricted to few large players, we should find that higher interest rates are associated with smaller volumes, on average. Our finding is, instead, that the largest volumes are associated with banks in the upper quintiles of the interest rate distribution (table 3), suggesting that market power may be playing an important role. As euro-area harmonised interest rates are volume-weighted averages, this finding also indicates that there may be some interest in focusing on the determinants of interest rates by quintiles (as we will do in the next paragraph) if one is interested in analyzing these harmonised rates. Finally, the analysis of the interest rate distribution also shows that, for the APRC and the AAR on new business with initial rate fixation up to 1 year, the weighted average had usually been higher than the third quartile[22]. This confirms that the largest banks in this market tend to charge higher rates than banks located in the middle of the distribution.

So far, we considered consumer credit as a single market but we already know that types of loan and geographical location for a significant part of interest rate variability, according to Bertola et al. (2005). Households may finance their current consumption by choosing among a wide range of financial products: personal loans, revolving cards, or loans targeted to the purchase of goods. Even if classified as loans for consumption, those products are different under several dimensions: for instance, the degree of "collateralization " or the number of agents involved in the contract. They are also supplied by different agents: commercial banks, specialised banks, financial intermediaries, and this heterogeneity has to be taken into account.

We, therefore, consider separately the four types of consumer credit for which volume data are available: 1) targeted credit (t. c.) for durable goods; 2) t. c. for cars; 3) t. c. for other items; 4) non targeted credit (that include instruments such as personal loans and revolving credit cards). Table 4 provides a breakdown of consumer credit by type (reporting their share of the overall market and the number of banks offering each type). Table 5 shows a standard measure of concentration (CR4) for

[21] It remains true, however, that the whole distribution could be shifted upward in a less developed market.
[22] We have this comparison for December 2003, 2004 and 2005.

the four types of consumer credit. The first three categories had CR4 between 65 and 85 per cent (and the market leader, which is the same in all the three markets, has market shares well above its immediate follower) while the non targeted segment has a CR4 below 40 per cent and the market leader is slightly above 10 per cent.

The key issue here is whether interest rates are significantly different among these types or not. Harmonised interest rate statistics do not distinguish between targeted and non targeted consumer loans but, to get an idea of existing differences, we can take advantage of the fact that there are several banks specialized in either one of the two segments. Accordingly, we identified banks that operate almost exclusively (meaning for more than nine tenths of their total consumer lending) in a market. Considering the three categories of targeted loans together, we identified fifty banks (that we call, for brevity, *targeting banks)* satisfying the ninety per cent threshold. They hold a share of the total targeted loans slightly above 60 per cent (of which 53, 57 and 76 respectively for the three categories) as of June 2006. Banks satisfying the non targeted loans threshold (*personal banks)* are more than four hundred, accounting for over two thirds of the market. Interestingly, for these banks consumer credit is not a "core" activity: the correlation between the weight of non targeted loans in the total consumer portfolio and the weight of consumer lending in the total loan portfolio is equal to - 0.45 (statistically significant at the 1 per cent level)[23].

Weighted averages are consistent with this picture: interest rates applied by banks specialized in targeted credit were 11.18 per cent per annum and rates applied by banks specialized in non targeted loans were around 8.76 per cent. Interest rates applied by banks[24] that do not satisfy the ninety per cent "specialization" threshold in either segment were equal to 9.31 per cent. Although harmonised interest rates are collected from a representative sample of the entire population, the coverage of the sample also remains quite good with respect to the sub-categories analyzed. The market shares of the banks included in the sample (those for which interest rate data are available) are reasonably close to those of the population for each category (57 per cent instead of 66 per cent for banks specialized in non targeted loans, 43 per cent instead of 60 per cent for banks specialized in targeted loans, 33 per cent instead of 35 per cent for the residual category).

[23] This correlation is computed on the intermediaries that belong to the MIR sample (that account for more than 80 per cent of the total assets of the banking system).

[24] Among them, there are four banks that account together for considerable market shares in all the four categories (30, 40, 17 and 25 respectively) and, accordingly, in the whole market (35 per cent). Three of these four banks are significantly specialized in consumer credit (they have a ratio between consumer lending and total loans above 0.75).

Through this identification procedure[25], we corroborate, for a sample highly representative of the population, the result, found by Bertola et al. for the portfolio of a single intermediary, that there is some significant variability among different types of consumer loans. What may lie behind these differences (risk, market power, economies of scale) will be the object of the econometric exercise presented in the next paragraph. As for descriptive statistics on risk, data on bad consumer loans broken down by type of consumer credit are not collected by the Bank of Italy. Some information on this breakdown are collected by Assofin, the Italian Association for Consumer Credit and Mortgages, that represent over 50 intermediaries with a share of over the 65 per cent of the overall market and almost 100 per cent of the targeted loans market. According to their data[26], as of June 2006 targeted loans had a bad loans ratio equal to 3 per cent while personal loans had a ratio equal to 3.9 (Assofin, 2006).

4. An empirical analysis on the determinants of the Italian interest rates on consumer credit

To carry out our empirical analysis, we resort to the database of the Monetary Financial Institutions Interest Rates (MIR). Started in January 2003, it collects monthly, according to harmonised definitions and methodologies defined in the Regulation ECB/2001/18, 45 interest rates relative to outstanding loans and new business on loans and deposits in euro to non financial corporations and households resident in the euro area.

Data collection in Italy is based, as in almost all the other countries of the area, on a sample of credit institutions, selected on the basis of stratification criteria such as size and regional location. The current sample (121 banks) accounts for 82 per cent of total loans and for 84 per cent of total consumer lending.

Three different types of data on interest rates on consumer credit are available: Annual percentage rate of charge on new business (APRC, see note 7), AAR on new business (NB) and AAR on outstanding amounts (OA). They may convey different information: rates on outstanding amounts reflect average prices applied to outstanding loans but are slower in reacting to changes in

[25] We tried a similar exercise, identifying regional banks on the basis of the predominant localization of their consumer lending. However, banks that were identified in this way, were mainly small mutual banks that, in light of their size, were not included in the sample reporting harmonized interest rates. Accordingly, we are not in the position to repeat the previous exercise, this time identifying “regional” interest rates instead of interest rates “by type”.

[26] More precisely, the data are drawn from a private credit bureau database (CRIF) that cooperates with Assofin in redacting a biannual Report on consumer credit. Figures for bad loans are around a percentage point higher than data related to entire universe of the intermediaries.

the monetary policy stance or in the competitive conditions of the market. Rates on new business have the opposite pros and cons; they may lack some robustness (this is true, however, more for single banks than for the market as a whole) but are a better indicator of recent developments. Finally, the APRC consider charges not included in AAR and it is therefore a more comprehensive measure of the effective costs borne by households. Our exercises will investigate the determinants of the APRC by exploiting monthly data covering the period Jan 2003 - Oct 2006. We take into account differences both in maturity and sector (consumer households, sole proprietorships and non profit institutions serving households). Overall, our dataset is made up of more than 9,000 observations (each relative to a specific combination bank/period/sector).

4.1. Panel analysis

Our empirical analysis is mostly based on the following general specification:

$$r_{ijt} = \beta' X_{it} + \eta_i + \psi_j + \phi' d_t \qquad (1)$$

where r_{ijt} is the interest rate on consumer loans charged by bank *i* to sector *j* in month *t;* X_{it} is a vector of bank specific time-varying covariates; η_i is a bank-specific fixed effect; ψ_j is a sector-specific fixed effect; d_t is a vector of time-varying covariates.

In more detail, X_{it} includes variables[27] such as the log of total assets (*lnassets*), the ratio of total consumer lending to total assets (*cons_weight*), the rate paid by each bank on its main source of funds (*cost_funds*[28]), and two terms capturing asset composition by maturity[29]. Asset composition in terms of type of consumer loans is approximated by a dummy variable (*personal*) taking a value of

[27] Differences in efficiency are accounted for by individual fixed-effect as cost variables are available only quarterly.

[28] When banks do not collect deposits from the general public (for example because they do not have a network of branches, we use the cost of their borrowing on the interbank market. In a few cases, there are banks belonging to banking groups that do not report either data. In this event, we use as a proxy the cost of funds for the bank holding, assuming that intra-group markets of capital are at work.

[29] We included the ratios of loans with maturity less than 1 year and, respectively, from 1 to 5 years, over total loans for consumption granted by the bank (the ratio for loans with maturity more than 5 years was dropped due to collinearity).

one when the ratio (computed in each period) between non-targeted and total consumer loans is above 0.9[30].

Risk is approximated by two measures: first, we use a standard *ex-post* index, the non performing loans (NPL) ratio on consumer loans (*nplcons*), which summarizes the existing risk in the outstanding consumer loan portfolio of a bank and is, under the hypothesis that risk has been correctly priced, a natural variable to include. Pricing of consumer loans might, however, rely much less on individual characteristics than pricing of other types of loans (as hinted by the findings of Bertola et al., mentioned in footnote 3), because the terms of the contract are already defined and therefore pricing must be based on the overall characteristics of the population that could apply. For this reason, we added to the NPL ratio an additional measure, summarizing the risk of the pool of potential loan applicants in the areas where the bank operates. We defined this additional variable by weighing the regional NPL ratio on loans to households[31] with the regional composition of the individual loan portfolio (*nplreghh)*. As the correlation between the two measures is quite low (around 0.04), we do not expect significant problems of collinearity.

Among the X_{it} variables, we also consider bank-specific measures of market power: we use the market share of each bank (*mktshare)* but we verified that results do not change by using a measure of the competition faced by each bank, obtained by weighting its outstanding consumer loans in a region with the Herfindahl index for that region (*Herf_i_reg)*.

Finally, as time-varying covariates in d_t we use, on most specifications, time fixed-effects. In the quantile regressions, where fixed-effects are not used (see below par. 4.2), we include, in our regressions, the log of trade sales (*lntradesales*), the log of sales of commercial vehicles (*lncarsales*) and the main policy rate of the European System of Central Banks (*ECB_mro*).

Results are reported in table 6. We show four specifications, two that differ just for the covariates included and two that report the results of, respectively, robust[32] and weighted regressions[33]. Signs and significance of the coefficients are broadly consistent across specifications

[30] We also included in some specification a similar dummy for targeted loans but its effect is usually non significant, probably owing to the relatively limited number of observations in this class (specialized banks in targeted loans are 50 but several of them are not included in the sample of reporting agents).

[31] As the regional breakdown is not available for bad loans relative to consumer credit only.

[32] The robust regression is a way to deal with potential outliers that computes the Cook's D values and drops observations for which the value is greater than 1. Then, it compute iteratively weights to be attributed to observations, based on idea that the larger the residual, the smaller the weight.

[33] The weighted regression utilizes the amounts associated to each observation of the interest rate to weigh its importance. As we already recalled, harmonised interest rates are weighted averages and, therefore, this regression has a clear interest for this exercise.

and rates (although some discrepancies will be noted and commented later on) and largely confirm standard priors about their effects, with an important exception.

Asset size is negative and significant in both the robust and the weighted regressions while it is not significant in the remaining regressions. Overall, this may indicate that some economies of scale and scope may be at work, at least for the biggest players of the market. The cost of funds is not included as costs associated to fund-raising are taken into account both by the individual fixed-effects and by either the official interest rates or the time dummies. Moreover, it is likely to be affected by some measurement errors (see footnote 28)[34].

The market share of the banks is significant with positive signs across specifications, suggesting that competitive conditions exert a clear influence on pricing[35]. To understand the implications of the estimated coefficient, one may consider that moving from the 10th to the 90th percentile of market share implies a rise in the APRC ranging between 65 and 90 basis points (using the coefficients of the basic and of the robust specification, respectively), i.e. between a third and a half of the current differential with the euro area average.

What comes as a surprise is the role of risk. The NPL ratio for consumer loans is never significant across all the specifications and results are quite blurred also for the other measure of risk (the regional NPL ratio on loans to households weighted with the regional composition of the loan portfolio). The interaction terms of risk variables with the asset composition dummy provide some useful qualifications of these results: the interaction term between *nplreghh* and *personal* (*pers_nplreg)* is negative and significant in most specification, suggesting that this risk variable is most significant for targeted loans. This can be rationalized thinking that, for this category of consumer loans, pricing conditions are defined before the loan applications by customers (and the bank is left only with the option of rejecting an application altogether)[36]. This could explain the positive influence of a variable that should catch the *ex-ante risk* of the population in each region.

The interaction of *personal* with *nplcons* is positive and significant only in the robust regression, consistent with the expectation that personal loans are more akin to traditional loans. The fact that this interaction term turns out to be positive is consistent with the evidence mentioned in paragraph

[34] We include it in some unreported specification but it rarely turned out significant.

[35] The finding that concentration significantly affects interest rate on loans is consistent with the evidence found in De Bonis-Ferrando (1997); they had a provincial breakdown in their analysis but they do not have any separate evidence for consumer credit. For the U.S. market, Kahn et al. (2005) found that personal loan rates are higher in concentrated markets.

[36] The specific risk of the borrower may be important in determining whether or not a household has a targeted loans, but not its price.

3.2 about the relative risk of targeted and non targeted loans. It is also in line with the hypothesis, suggested by Bertola et. al (2002), that moral hazard and adverse selection may be more a problem for personal loans than for targeted loans. The underlying logic is that a non targeted loans could be gambled away, instead of being used for the declared purpose and that the purchase of, say, kitchen appliances could be positively correlated with one's inclination to repay.

4.2. A quantile regression approach

We included among our covariates *observable* characteristic of banks such as size, costs and specialization in non targeted loans as a part of the consumer lending. *Unobservable* or unmeasured heterogeneity among agents has been taken into account by means of a standard panel framework where this heterogeneity is accounted for by bank-specific fixed effects. and a common slope among the agents defines the causal effects on the dependent variable. If the true structure of the heterogeneity corresponds to that assumed when using the panel techniques, the estimates are not affected by any bias.

A different structure of the heterogeneity is proposed by "quantile regression" techniques (Koenker e Bisset, 1978); with this approach, causal effects are estimated for the entire conditional distribution of a dependent variable, given a set of covariates. These methods relax the hypothesis of a common slope and allow us to specify an interest rate equation as follows:

$$r_i = \beta_\theta' X_i + u_{\theta i} \tag{2}$$

where *i=1, ..., N* is the number of the observations, θ is the quantile analysed, X_i is the vector of covariates. The distribution of the error terms is unspecified. It is only assumed that they satisfy the following restriction (Buchinsky, 1998): $Q^\theta(u_{\theta i} \mid X_i) = 0$ i.e. $Q^\theta(r_i \mid X_i) = X_i \beta'_\theta$

Using equation (2) we estimated a interest rate equation at different quintiles, θ = .10, 25, 50, 75, 90, with the same set of independent variables for each regression[37]. In this setting, the derivative of the conditional quantile θ with respect to the independent covariate (say, risk) is given by

[37] The θ th regression quantile of y is the solution to the minimization problem of the sum of absolute deviations residuals

$$\min_{\beta} \left\{ \sum_{i: r_i \geq \beta' x_i} \theta \left| r_i - \beta' x_i \right| + \sum_{i: r_i < \beta' x_i} (1-\theta) \left| r_i - \beta' x_i \right| \right\}$$

By varying the value of θ, the entire distribution of β at any given percentile may be traced. Each quantile is estimated by differently weighting the residuals. For the median regression all residuals have a equal weight. When the 75th percentile is estimated, positive residuals are weighted by 0.75 while negative residuals are weighted by 0.25. The criterion is minimized, and the appropriately beta identified, when the 75 per cent of the residuals are negative.

$$\frac{\partial Q_{\theta}(r_i \mid x_i)}{\partial risk_i} = \beta_{\theta}^{risk} \tag{3}$$

and may be interpreted as the response of the dependent variable to changes in the covariates at a specific point in the conditional distribution of the dependent variable[38].

Results from the quantile regressions are reported in table 7. First, we compare the results from the median quintile regression and those from the standard OLS regressions, showing that the central tendency results are consistent (in terms of both coefficients and significance).

Then, we look at the results for the remaining quintiles to verify whether heterogeneity among banks is playing any significant role.

The coefficients of the risk measures *nplreghh* tend to decline monotonically as one moves toward the right tail of the interest rate distribution and, in the 90[th] percentile, turn out to be negative and significant. Such a decrease, might be driven by the fact that interest rates lying in the right tail of the distribution are charged by large banks (as shown in section 3.2), which have higher market power and might be less sensitive to risk.

Interactions between *nplreghh* and *personal* are negative confirming the results shown in the previous section, i.e. that such a risk indicator is mainly significant for targeted loans.

Summing up, the fact that findings from our quantile regressions are broadly in line with those found in the previous section is reassuring. A note of caution is, however, due, as bank-specific fixed effects cannot be included in these specifications, owing to the fact that it is still not clear in the literature how these fixed-effects should be handled in the quantile regression framework.

4.3. The determinants of the additional charges

A final empirical exercise focuses on a specific part of the costs of consumer credit, i.e. charges additional to interest rates, typically expenses linked to a (successful) loan application. Tables 6 shows that the dummy for consumer households changes its sign, suggesting that charges might be particularly sizeable for this category of customers. To verify this (and other) aspects, we run a regression based on a specification analogous to equation 1 but for the dependent variable (obtained by subtracting the weighted average of AAR to the APRC).

$$c_{ijt} = \beta' X_{it} + \eta_i + \psi_j + \phi' d_t \tag{3}$$

[38] In equation (2), the parameter measures the interest rate variation required for remaining at the θth quantile of the conditional distribution after the variation in the dependent variable had occurred.

These charges can be very substantive (the difference between the 10^{th} and the 90^{th} percentile is more than 110 basis points) and their determinants partly overlap with those already found for the interest rates. Results are summarized in table 8 and show that consumer households (that constitute slightly more than half of our sample) pay more charges than the other subgroups. Large banks apply relatively higher charges, showing that economies of scale, if any, are slow to translate in benefits for customers.

5. Conclusions and directions for future research

While there seems to be a wide agreement on the fact that the Italian consumer credit market is growing, deepening and getting more sophisticated, it is less clear whether this would be enough to affect current interest rates or not. A major factor that could steer the future evolution is competition. Analyzing the determinants of interest rates on consumer credit in Italy in the last few years, our result seem to suggest that market power exerts a significant influence on pricing. While our results certainly need some further robustness analysis, they firmly suggest that banks with market power generally charge higher rates.

The missing element in the price equation is risk. Measures of (ex-post) risk such as the non-performing loans ratio show that the consumer loan segment is not particularly risky. According to results from a quantile regression approach, a standard relationship between risk and prices exists only for the lowest quintiles of the interest rate distribution. For banks applying interest rates above the median, prices are less sensitive to risk.

Our conclusions are necessarily preliminary. As we emphasized throughout the paper, several dimensions contribute to defining a consumer loan and for several of them we are still lacking even basic information. This does not mean that firmer conclusions cannot be reached on this topic. We are confident that micro-data from the survey on household income and wealth and from the survey of service firms could shed some more light on the mechanisms underlying consumer credit pricing, especially when a third party (typically, a dealer) is involved.

Another avenue that could be usefully pursued is to take advantage of data collected in compliance of anti-usury laws. While they are not comparable across countries, they have a finer breakdown by types than harmonised data and include data collected from financial intermediaries other than banks.

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Table 1 [1]

(millions of euros)

	Austria	Belgium	Germany	Spain	Finland	France	Greece	Ireland	Italy	Luxembourg	Netherlands	Portugal
2002	22,886	8,651	225,187	53,800	6,705	121,118	9,757	14,485	28,386	1,114	18,647	8,161
2003	21,525	8,648	174,919	55,603	7,324	128,415	12,386	12,310	33,012	1,185	20,442	8,720
2004	24,769	8,013	174,448	62,367	8,047	134,093	17,025	14,725	38,117	1,269	23,480	9,089
2005	27,878	8,533	171,048	77,235	9,401	141,976	20,821	17,509	44,335	1,289	24,625	9,427
2006	26,697	8,861	167,605	92,130	10,423	149,034	25,544	19,996	49,878	1,290	25,351	11,416

(1) IV quarter of each year

Table 2

(percentages)

	Austria	Belgium	Germany	Spain	Finland	France	Greece	Ireland	Italy	Luxembourg	Netherlands	Portugal
Cumulated rate of growth 2000-2006	57.4	3.5	-22.7	112.4	240.1	43.0	541.2	127.4	187.8	35.6	97.3	65.1
Share of the euro-area market 2006	4.5	1.5	28.5	15.7	1.8	25.3	4.3	3.4	8.5	0.2	4.3	1.9
Share of the euro area market 1999	3.8	1.9	48.8	9.8	0.7	23.5	0.9	2.0	3.9	0.2	2.9	1.6

Table 3 Quintiles of the interest rates distribution and average volumes of business *(millions of euros)*

Total	**APRC on new business**	**AAR on Outstanding amounts**
quintile = 1	3.52	60.11
quintile = 2	9.94	93.38
quintile = 3	8.37	80.10
quintile = 4	30.19	250.92
quintile = 5	33.78	330.56

Table 4
(June 2006)

	Targeted						Non targeted	
	durables		cars		others			
	share	number of banks	share	number of banks	share	number of banks	share	number of banks
Total	0.065	312	0.284	322	0.095	327	0.555	630
of which: Share over individual portfolio > 0.75		9		14		17		481

Table 5
(June 2006)

	Targeted (share)			Non targeted
	durables	cars	others	(share)
CR4	75.42	65.64	86.68	39.14

Table 6
Panel analysis
(Individual and fixed effects are included but not reported in all the regressions)

Variable	A	B	Robust	Weighted
lnassets	-0,346	-0,329	-1,046 ***	-2,075 ***
consH	0,290 ***	0,291 ***	0,277 ***	0,611 ***
NPISHH	-0,622 ***	-0,617 ***	-0,805 ***	-3,509 ***
short	1,624 *	1,611 *	6,713 ***	1,466
medium	0,836 ***	0,850 ***	0,881 ***	-1,272 ***
nplcons	0,947	0,442	-0,068	-1,395
nplreghh	4,930 *	6,263 **	0,065	23,623 ***
mktshare	41,270 ***	39,875 ***	55,550 ***	54,189 ***
personal	0,102	0,223 *	-0,041	1,168 ***
pers_mktsha		8,534 *	8,080 **	0,704
pers_nplcons		2,007	3,255 ***	-0,363
pers_nplreghh		-3,913 *	-2,746	-23,548 ***
_cons	9,692 ***	9,160 ***	16,803 ***	29,862 ***
n. obs	9209	9209	9209	9209
R^2	0,63	0,63	n.a.	0,81

Table 7
Quintile regression

Variable	q10	q25	q50	q75	q90	*memo: OLS*
lnassets	-0,2 ***	-0,3 ***	-0,3 ***	-0,4 ***	-0,4 ***	*-0,3 ****
nplcons	-1,7	-0,9	-2,2 *	-1,5	-1,7	*-1,6 **
nplreghh	11,0 ***	9,1 ***	5,5 ***	-1,0	-7,8 ***	*5,4 ****
mktshare	12,8 ***	13,0 ***	14,8 ***	16,6 ***	15,5 ***	*15,8 ****
personal	0,7 ***	1,0 ***	0,8 ***	0,5 ***	0,9 ***	*0,9 ****
pers_mktsha	26,8 ***	25,0 ***	11,2 ***	9,5 ***	-10,6 *	*20,9 ****
pers_nplcons	2,1	1,6	-0,8	0,7	2,9	*2,2*
pers_nplreghh	-8,6 ***	-10,8 ***	-8,8 ***	-7,0 ***	-7,7 **	*-10,1*

legend: * $p<0.05$; ** $p<0.01$; *** $p<0.001$

Table8

Additional Charges (APRC minus weighted AAR)

(Individual and time fixed- effects are included but not reported in all the regressions)

Variable	A	B	Robust	Weighted
lnassets	.01637516	.01485038	.09610101 **	.11888488
consH	.17604266 ***	.17570695 ***	.08748666 ***	.16653949 ***
NPISHH	-.17929869 ***	-.18036909 ***	-.10072161 ***	-.30380468 **
short	-1.4777172 ***	-1.4792529 ***	-.47422856 ***	-.8276572 ***
medium	-.98817169 ***	-.99252714 ***	.04981115 *	-.30473743 **
nplcons	-.6245218	-.54671378	.00718877	-4.0736874 **
nplreghh	-1.298881	-.88555707	5.1698392 ***	2.5012902
mktshare	.6388902 ***	.72396231 ***	.45374929 ***	.67459544
personal	.01056856	.03640671	.04761282 *	-.46599156 ***
pers_mktsha		-1.8898635 -	-.60043946	.31199563
pers_nplcons		-.15433448	-.11093269	7.5828716 ***
pers_nplreghh		-.30524078	-1.1768028 ***	-2.7932997 **
_cons	1.6729458	1.7588131 *	-.70684864	-.05646555
n. obs	9209	9209	9209	9209
R^2	0,50	0,50	n.a.	0,91

Figure 1

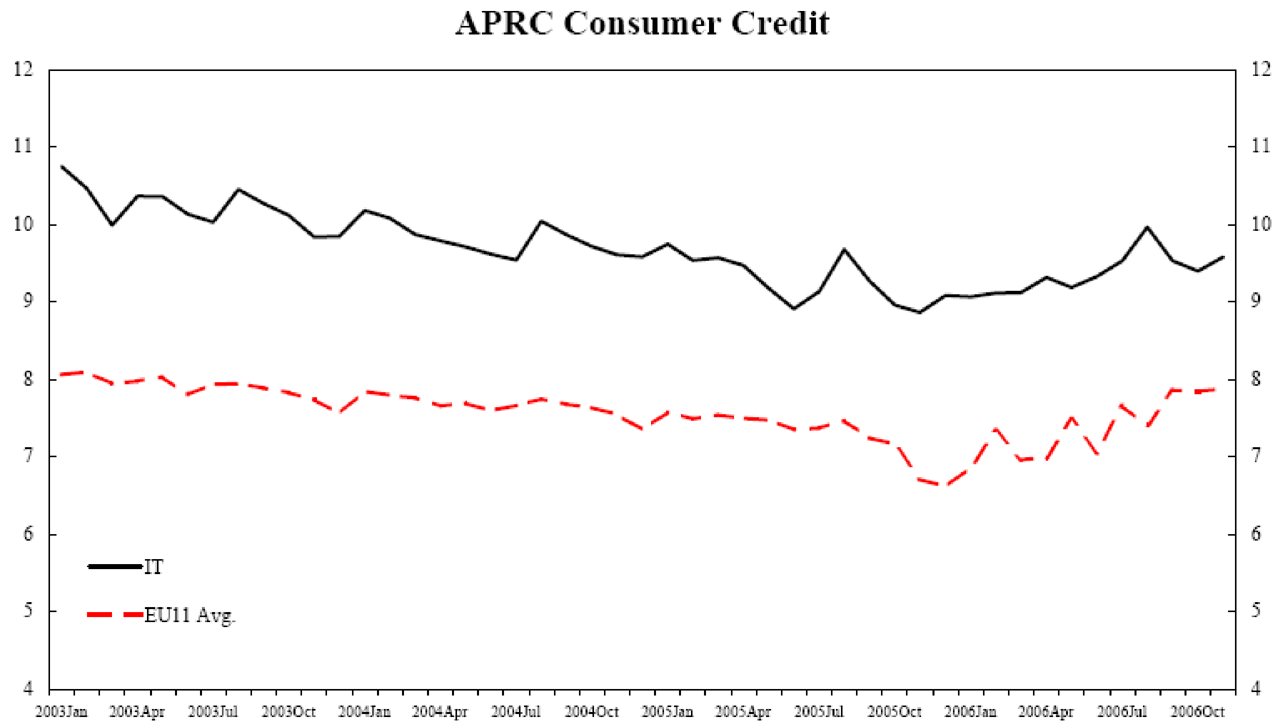


Figure 2

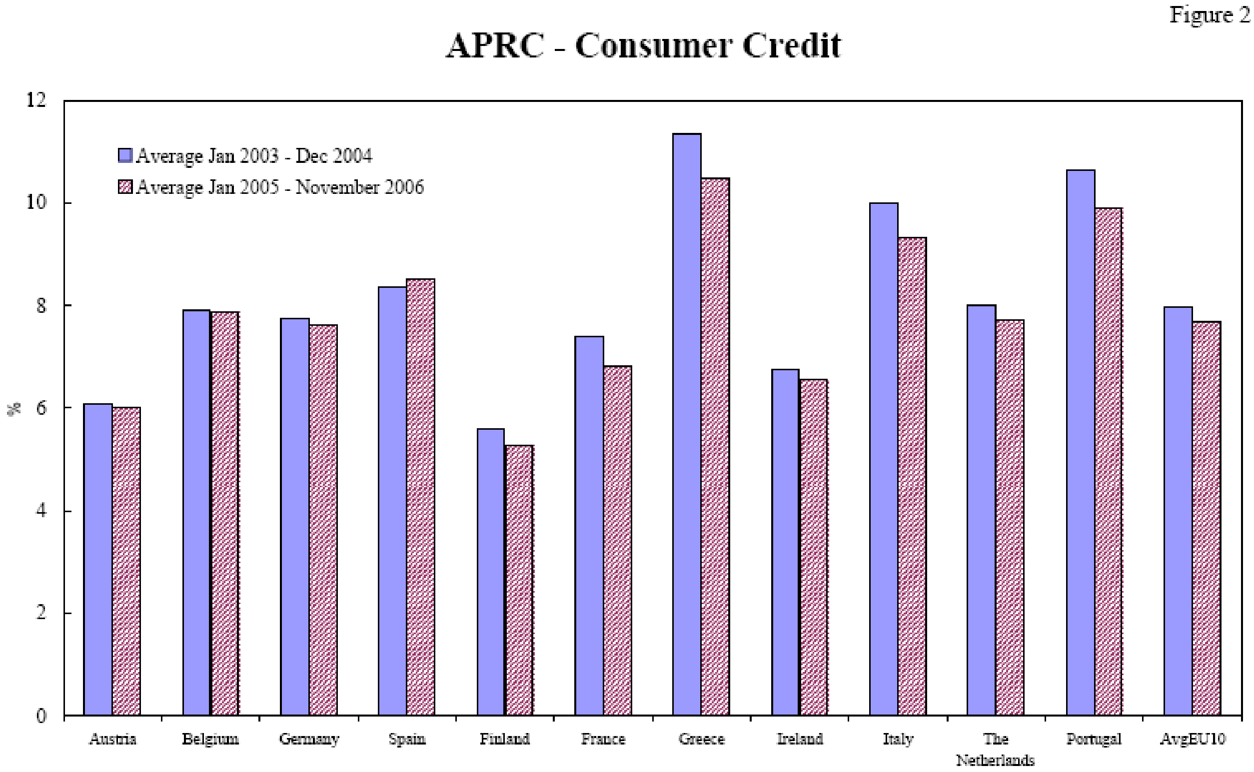


Figure 3

AAR - Average Jan 2003 Nov 2006

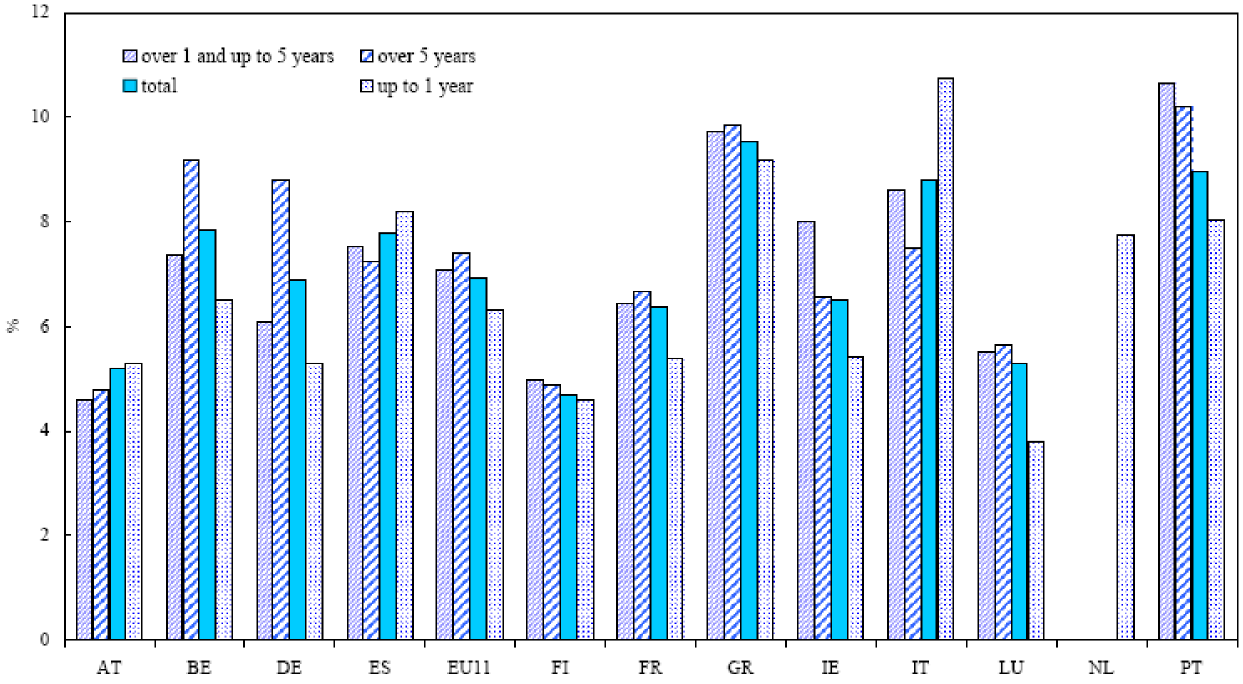
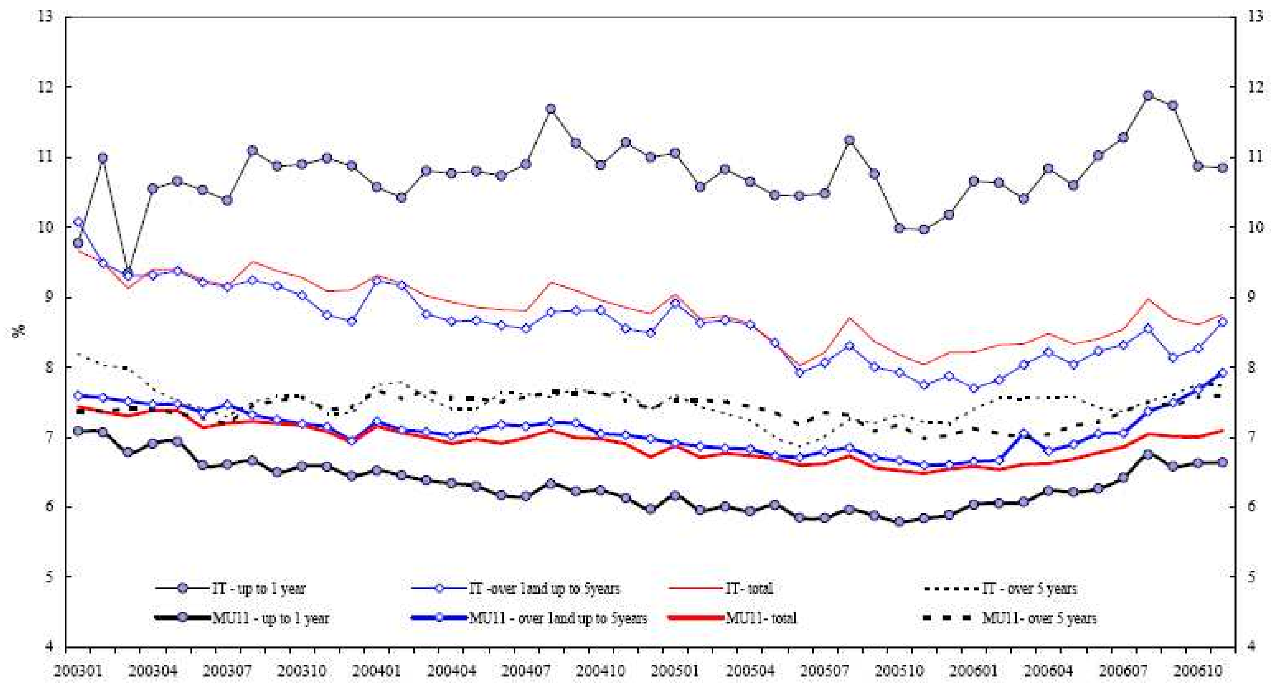


Figure 4

AAR - New business



Why is the volume of bank loans low in some countries and high in others?

The role of government debt*

Abstract

We investigate determinants of the size of banking loans in 18 OECD countries in the period 1981-1997. The novelty of the paper is to show that the ratio of government debt to GDP has a negative effect on the level of banking credit. Second, countries with a German legal origin have higher ratios of loans to GDP with respect to common law nations. Our results are robust to the inclusion in the regressions of several variables such as per capita GDP, stock market capitalization, the banking reserve requirement, the inflation level and its volatility.

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1. Introduction

Banks are a key element of financial structures all over the world, contributing to the financing of the economy and the management of the payment system. But, why are banks more important in some countries than others ? In 2004 the ratio of loans to GDP was around 46 per cent in the U.S., 77 per cent in France and 100 per cent in Germany. The ratio of deposits to GDP was 40 per cent in the U.S., 68 per cent in France and 86 per cent in Spain.

Different strands of literature studied how the level of banking loans is influenced by economic and institutional variables. Since the Sixties the financial repression approach rationalised the restrictions that affected the financial systems of industrialised countries (McKinnon, 1973; Show, 1973). These studies refer to policy instruments – such as high reserve requirements, implicit taxes levied through inflation, explicit taxation, the public debt – that might reduce the size of banking systems. On the contrary, path dependency theories of financial development stress the role of legal origin as the central factor driving the cross-country differences we observe today (La Porta et al, 1997). Other authors state antinomies between banks and stock markets. This is a very old debate, whereas other studies postulate a positive nexus between banks and equity markets.

The goal of this paper is to present new evidence on the determinants of banking loans in OECD countries, trying to discriminate between the different factors by nesting them in a general empirical model. The issue we address has not only a theoretical but also a policy relevance. If factors that limit banking development are detected, political authorities may introduce reforms to foster bank credit, whose link with economic growth is established by many contributions. As far as we know, the novelty of our paper is to underline the negative effect of government debt on the volume of bank loans.

We investigate factors driving those cross-country differences by exploiting a longitudinal dataset for 18 OECD countries that covers the years 1981-1997.

The paper is divided into 5 sections. Section 2 reviews the literature. Section 3 presents the data and introduces some stylized facts. Section 4 illustrates the empirical specification and discuss the econometric exercises. Section 5 contains some robustness checks. Section 6 concludes.

2. A review of the literature

Our paper is connected to different strands of the literature.

A first link is with the theory of financial repression. This approach emphasizes a supply side aspect of financial development. Governments may repress the size of the financial and banking sectors to raise revenues from alternative channels that lie under their control. Financial repression artificially increases the private sector's demand for those assets that are the basis of implicit taxes, e.g. the monetary base and the public debt. By the second half of the 1960's, regulations, taxes, qualitative and quantitative controls, often introduced to pursue monetary policy goals, made it difficult for financial intermediaries to operate at their full technological potential (Roubini and Sala-i-Martin, 1995). These measures shrank the financial systems of many countries (Battilossi, 2003). Here we review some of the contributions on these subjects.

Following Fisher's old intuition on debt deflation, Boyd, Levine and Smith (2001) assert that inflation causes lower rates of return of loans, thus leading to reduced credit. Smaller real returns can not only decrease the availability of financing but also draw lower quality borrowers into the pool of credit seekers. The authors find a negative relationship between inflation and banking sector size.

There are linkages among inflation, reserve requirement and governments bonds. Brock (1989) considers not only the inflation tax levied on currency but also that on banks' non-interest bearing reserves. In addition, controls to the composition of the bank's portfolio are complementary instruments of financial repression. Governments may impose portfolio constraints by setting public debt securities as the only assets eligible for meeting banks' requirement. As a consequence, banks resources are channelled towards the purchase of government bonds. Further, the government may impose credit ceilings as demonstrated by many industrialised countries in the Seventies. Giovannini and De Melo (1991) explain how nominal interest rate ceilings combined with controls on international flows may generate an artificially low cost of domestic funding for the government and consequent revenues from financial repression. However the link between fiscal policy and banking is not entirely clear. Studying the Italian case, Piluso and Ricciuti (2008) find a pro-cyclical behaviour of public spending, taxes and bank variables, even if the causal links are not investigated.

Our paper is also linked with the law and finance view. This approach emphasizes the idea that early institutions and arrangements persist over time and determine current outcomes. The mechanism rests on two points: on the one hand, the basis of finance is the protection of investor and creditor rights; on the other hand, the legal origin of countries is the source of such basis. Legal systems are classified into four origins: Anglo-Saxon, French, German and Scandinavian. They emerged over the previous centuries, internationally spread through conquest and imitation and explain the differences in investor protection, contracting environment and financial development that industrialised countries exhibit today. La Porta et al (1997) show that countries with higher shareholders rights and common law traditions, by and large nations of Anglo-Saxon legal origin, have relatively larger financial markets. The legal approach has been criticized because it overlooks structural breaks in history. Beck, Demirguc-Kunt and Levine (2003a) compared the legal traditions paradigm with the "adaptability channel of law": the authors find that legal origin matters for financial development because legal traditions differ in their ability to adapt efficiently to evolving economic conditions. They conclude that in terms of adaptability the German system is closer to the common law than the French legal system.

Other scholars criticized the legal origin approach, underlining the role of changing over time interest groups in explaining cross-country differences in financial systems. Rajan and Zingales (2003) say that preferences of influential interest groups were implemented through the century by the trade openness choice: they show how both in 1913 and in 1997, for any level given of demand, financial development was higher in countries that were more open to trade.[1] The intuition is that international competition weakens the incumbents' opposition to financial development. Quy-Toan Do and Levchenko (2004) provide empirical evidence that trade openness affects financial systems of countries in a non linear way: among developed countries trade promotes financial systems while it has an opposite effect among the poorer ones. Chinn and Ito (2006) focus on the effects of capital account liberalisation for financial growth and conclude that financial openness matters only when a threshold level of legal and institutional development has been attained.

In Section 3 we present our empirical strategy.

3. The data and some stylized facts

We examine the effects of forms of financial repression and legal origin on the volume of bank loans, controlling for stock market capitalisation, per capita income and other indicators. We use both contemporaneous variables (such as the reserve requirement and public debt), lagged variables (such as per capita GDP) and time-invariant variables (such as legal origin) referred to 18 OECD countries. The analysis is based upon data originally recorded at an annual frequency, over the period 1981-1997. We chose this time interval because the first composition of the euro area was defined in 1998 and this institutional break might have affected both the behaviour of private credit and its statistical definition[2].

With regard to our dependent variable, we use the definition adopted by Levine and Zervos (1998) and Levine, Loyaza and Beck (2000), i.e. the credit granted by the banking system to the private sector, relative to GDP.

[1] Alcalà and Ciccone (2003) show how trade openness was a robust determinant of economic growth over the 1960-1996 period.

Moving to the independent variables, financial repression is measured through different indicators. The reserve requirement is proxied by the ratio of bank liquid reserves to bank assets. Inflation rates are measured as annual growth rates of the consumer price index. Also inflation volatility, which we measure with the annual standard deviation of the monthly inflation rate, might affect credit. Public debt is measured by the gross general government debt as a percentage of GDP. It is difficult to collect statistics on other financial repression instruments, such as quantitative ceilings or controls on deposit and lending rates. Moreover most of these measures were gradually suppressed in OECD countries in the 1980s. Legal origin is considered using the dummies introduced by La Porta et al (1997). The same source was exploited to assess the level of creditor rights protection. Trade openness is measured with the index suggested by Rajan and Zingales (2003), i.e. the sum of exports and imports of goods and services as a share of GDP.

According to a large, though still controversial, body of literature, there is a link between economic growth and finance[3]. We take this debate into account by using per capita GDP as a proxy of the demand side schedule which might influence the equilibrium level of banking credit. Per capita income is measured in terms of purchasing power parity.

Finally, other studies look at financial systems emphasizing the antinomy between bank based and market based countries. This approach implies that banks and markets are substitutes: households may prefer to invest in deposits rather than in shares; firms may favour shares over banking loans. In a different perspective, stock market capitalisation may promote banking activity if banks and markets play a complementary role (Levine and Zervos, 1998). In this view both intermediaries and markets matter for growth (see Demirguc-Kunt and Levine, 2001, for a synthesis). Given the existence of different opinions, we control how stock market capitalization, as a share of GDP, is linked to banking intermediation.

Table 1 reports the definitions and sources of the data, while Table 2 lists the countries we selected, mainly on the basis of the available long term time series. Table 3 presents some descriptive statistics. Over all periods and all countries, the average ratios of loans to GDP is 0.71. As indicated by minimum and maximum values, there are marked differences across countries and years for both banking loans and explanatory variables.

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[2] The creation of the euro area implied a new definition of many items of bank balance sheets in member States.

[3] While the direction of causality is difficult to establish, the predominant empirical finding is that financial development causes economic growth (see Levine, 2003, for a survey). There is also an opposite view that probably was initiated by Joan Robinson's claim that "finance follows". Allen, Bartiloro and Kowalewski (2006) show that financial institutions and markets develop in response to the needs of firms and the characteristics of the real economy.

Figure 1: Private Credit (as a share of GDP, 1981-1997) in 18 OECD Countries

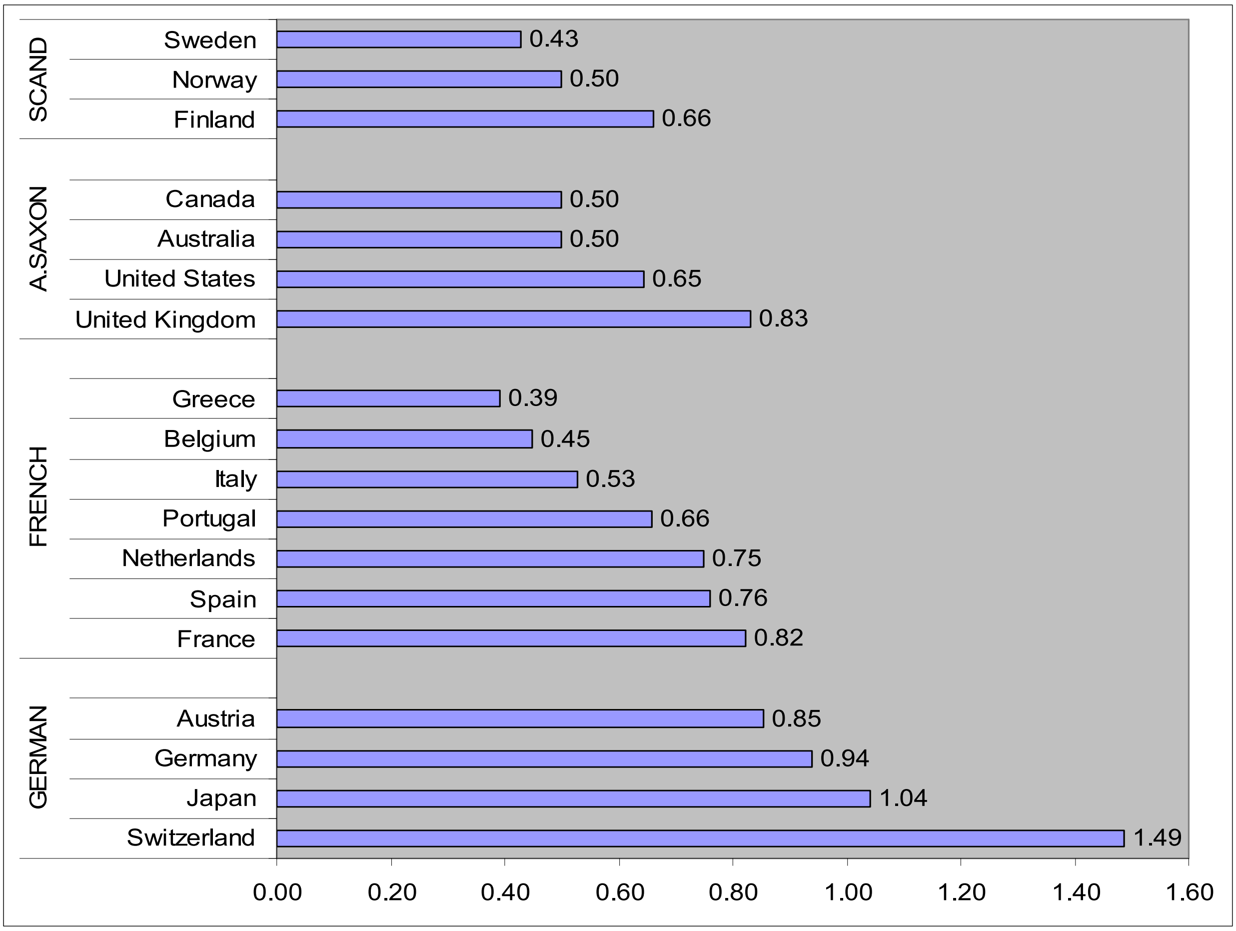

Figure 1 shows the link between private credit and the legal traditions of countries. Banking development is substantially greater in German tradition countries than in those with an Anglo-Saxon legal origin. Further, all Scandinavian countries are located below the overall average. The evidence is confirmed by the correlation matrix (Table 4): it shows a positive association between banking development and countries belonging to the German legal tradition while a negative correlation is detected for Scandinavian countries. The matrix also shows a negative correlation between government debt and the volume of bank loans. Negative linkages are observed for banking credit and both inflation rates and reserve requirement. Further, there is a positive association between banking credit, on the one hand, and both stock market capitalisation and per capita income, on the other hand.

In the following Section we turn to multivariate regressions.

4. The empirical specification and the econometric results

4.1 The empirical model

The panel nature of the dataset is exploited through a static model specified as:

$$priv_{it} = \alpha + \beta X_{it} + \eta_i + \varepsilon_{it}$$

where $priv_{it}$ are the loans to the private sector, the vector X_{it} contains time-varying determinants (such as financial repression instruments, per capita GDP and stock market capitalisation) while the term η_i captures time-invariant country components.

We follow the standard practice of taking five year-averages to remove the effects of business cycle from the analysis (see Islam, 1995). As a further control, we estimate our models over the original annual database (see paragraph 5.1). To tackle reverse causality between banking activity, on the one hand, and per capita income and stock market capitalisation, on the other hand, we re-estimate with variables lagged[4]. In such a way they are predetermined with respect to the dependent variable.

Cross-country heterogeneity was taken into account through legal dummies, or by estimating both random and fixed effect models. Time-invariant country specific effects were also used as a way of capturing cross-country unobservable heterogeneity:[5] we tried both fixed-effects (LSDV estimator and first difference estimator) and random-effects (GLS estimator).

4.2 Determinants of the ratio of banking loans to GDP

In studying the determinants of the credit granted by the bank system to the private sector, as a share of GDP, we follow a step-by-step procedure, starting from a simple model and then adding new variables. Overall we present seven different regressions (Table 5). Beginning with the financial repression variables, the inflation rate has sometimes a negative impact on bank loans, but the coefficients are never significant. Also the volatility of inflation does not statistically affect the ratio of credit to GDP. The coefficient of the reserve requirement has a negative sign but it is significant only in two regressions. Haslagh and Koo (1999) found a negative impact of the reserve requirement on banking business.

On the contrary, whatever specification we adopt government debt has a negative and statistically significant influence on the ratio of loans to GDP. A 10 percent increase in the government debt to GDP ratio is expected to lower credit granted to private sectors by 3 (regressions 2-3) or 5 (regression 7) percentage points, respectively. Our result may be driven by two crowding-out effects, which are not independent. Firstly, as well as the supply side is

[4] When we investigate five-years averages statistics, those explanatory variables are instrumented through five-years lagged terms, while as for annual data, the variables are instrumented through one-year lagged terms.

[5] In general terms, if legal origin may capture variability across countries, not accounted by time-varying determinants, pooled estimators with legal dummies become more efficient than the fixed effect estimator. Several degrees of freedom may be earned if the variability is captured through four legal dummies instead of eighteen countries components.

concerned, government-imposed controls and quantitative ceilings on financial markets shrank the volume of credit granted by the banking sectors, on the one hand and increased artificially the demand of securities issued by governments, on the other hand. According to the public finance approach to financial repression, issues of public bonds are a way of collecting revenues by the State (Giovannini and De Melo, 1991; Battilossi, 2003; Roubini and Sala-i-Martin, 1995). Secondly, as well as the demand side is concerned, low volumes of bank loans are demanded by the private sector of countries having high shares of state-owned companies – which absorb part of loans made available by banking systems. Our results are consistent with those obtained by Hauner (2008), who finds a negative link between public debt held by banks and financial development in middle-income countries.

While the financial repression literature brings into prominence distortions that affected the banking systems from the Sixties on, the legal origin theory emphasises an older historical derivation of financial systems. Our exercises show that a share of cross-country variability is captured by the legal origin components. The significance of the legal origin variables is reached both in regression 6 (where individual random components are allowed) and in regression 7 (where legal origin captures all the variability not accounted by time-varying determinants). Countries based on the German and French laws have greater ratios of loans to GDP than common law countries. The German origin effect is the strongest. German origin countries have around 50 percentage points higher ratios of private credit to GDP with respect to the common law countries, while French origin countries have around 30 percentage points greater ratios of loans to GDP with respect to the common law countries. The role of legal origin in influencing capital market development has been recognized by Beck, Demirguc-Kunt and Levine (2003a), even if associated with the initial endowments of countries. While La Porta et al. (1997) state that common law countries are more favourable to financial development, we find that German and French laws conduce to higher ratios of loans to GDP. This possible puzzle is pursued in paragraph 5.3.

Moving to the control variables, per capita income has a positive impact on the ratio of loans to GDP. This is true using contemporaneous per capita income (regression 2 and 4) while the coefficients are positive but not significant using lagged per capita income in fixed and random models (regressions 3 and 5). When legal origin dummies are added to the random-effect model (regression 6), we obtain similar results.

The econometric exercises of Table 5 also show that contemporaneous stock market capitalization has a positive but not statistically significant influence on the loans to GDP ratio, while the predetermined stock market capitalization has a positive and significant coefficient in both fixed effect and random effect models (regressions 3 and 5). Results are confirmed when legal origin dummies are added to the random-effects and pooled models (regressions 6 and 7). This positive nexus confirms the hypothesis of complementarity between stock market capitalisation and private credit highlighted in Levine and Zervos (1998).

Now we turn to some robustness checks of our econometric exercises.

5. Robustness checks

5.1 Do annual data regressions replicate the five-years average statistics results ?

To increase the efficiency of our estimates, we run other 9 regressions by exploiting annual statistics (Table 6). We consider the same seven regressions of table 5 plus two other exercises that include yearly-time dummies. Estimated parameters confirm the previous results. Government debt maintains its negative and significant influence on the ratio of loans to GDP. A move from the sample mean of 62 per cent to a ratio of 52 per cent is associated with a 3.5 (regressions 2 and 3), or 5 (regressions 8 and 9) percentage points increase in the loans to GDP ratio. Current inflation, its volatility, and the reserve requirement do not have a statistically significant effect on banking credit. The legal tradition confirms its role in explaining differences in variability of banking business across countries: relative to common law countries, German and French legal origins are associated to higher ratios of loans to GDP. The German legal tradition dummy has the largest coefficients. Per capita GDP and stock market capitalization maintain a positive and often significant impact on the ratio of outstanding loans to GDP.

5.2 Splitting the period into two sub-periods

Banking deregulation and liberalization were much stronger in the Nineties than in the Eighties. European Directives liberalized banking markets but the same process took place in other OECD countries like the US.[6] Also inflation, reserve requirements, and the level of government debt and capital account rules were different in the Nineties with respect to the Eighties. For this reason we split our sample in two periods, 1981-1989 and 1990-1997 to search for possible breaks in the determinants of the ratio of credit to GDP. The results, reported in tables 7 and 8, confirm our previous results. Government debt has a negative influence on private credit while the German legal origin keep its positive sign. The effect of the government debt to GDP ratio is stronger when the analysis is carried out over the period

1981-1989, as showed by the larger size of the coefficients. In this period, countries which reduce the government debt to GDP ratio by 10 percentage points, are expected to raise the credit to GDP ratio by 5.5 percentage points (see regressions 6 and 7) while as for the period 1990-1997, the same decrease of government debt is associated to a rise in the dependent variable by 4 percentage points.

5.3 Other robustness checks

Here we discuss other robustness checks of our regressions (for the sake of brevity results are reported only for the first exercise and are available upon request).

First, the size of the banking loans might be influenced by firms' issuance of bonds. One might argue that banking credit is more important where firms' securities issued are smaller (see Fink, Haiss and Hristoforova, 2005). To study the relevance of corporate bonds, we included in the model the ratio of bonds issued by non financial corporations to GDP. For 13 OECD countries data on corporate bonds are available in a time-series format. The econometric exercise (Table 9) shows that the corporate securities coefficient is never significant. The introduction of firms' bonds does not affect the previous determinants of the ratio of credit to GDP.

Second, we verified if the negative link between government debt and private credit survives after controlling for the importance of the State in the ownership of banks. The test consists of two regressions and makes use of statistics reported by La Porta et al (2002) for the years 1970 and 1995[7]. In the first test, a term capturing State ownership of banks is included as a determinant of private credit in a OLS equation running over a cross-section of statistics for 1995[8]. In the second one, a time-invariant term on State ownership of banks, as observed in 1970, is included as a determinant of private credit in a set of models for panel data (random effect, ols with time-dummies, pooled regression). All the regressions show that Government debt maintains a negative and significant linkage with private credit, even controlling for State ownership of banks. The signs and significance of parameters mimic those estimated in the analysis of the previous Sections. The coefficient for State ownership of banks is mainly negative but not statistically significant, without affecting the sign and the significance of government debt.

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[6] On the transformation of the European banking system see Gual (1999), Belaisch, Kodres, Levy and Ubide (2001), Dermine (2000) and (2003). On the American banking system see Berger, Kashyap and Scalise (1995) and Bernard and Bisignano, (2006).

[7] Other statistics on State ownership of banks are provided by Barth, Caprio and Levine in the World Bank web site, but refer to data collected from 2001 onwards.

[8] Outcomes provided by OLS regressions exploiting a few, i.e. 17 observations referring to OECD countries, are reported by Bleaney (1996).

Third, as seen in the literature review some authors claim a positive connection between trade openness and banking development. Our results show that trade openness has in most of the cases a negative effect on bank loans but the coefficients are rarely statistically significant and do not alter the previous estimates.

Fourth, in last years some scholars improved the measurement of indicators of banking regulation and supervision to understand national characteristics of banking business (see Barth, Caprio and Levine, 2006). Exploiting a dataset built in the World Bank for many countries, these authors analyze how banking intermediation is influenced by measures such as barriers to entry and competition regulatory variables, restrictions on banking business, separation between banking and commerce, capital ratios, deposit insurance, official supervisory action variables, market discipline and transparency. This line of research is very interesting, but information on banking regulation and supervision is available in the form of cross-section statistics and refers only to very recent periods, while in this paper we study the development of banking loans over two decades. A harmonized picture of banking regulation is not available for the Eighties. For these reasons, the World bank cross-section database is not used in our paper, even if we are conscious that regulation is an important determinant of banking intermediation.

6. Conclusions

We investigate factors driving cross-country differences in the volumes of bank loans by exploiting a longitudinal dataset for 18 OECD countries which ranges over the period 1981-1997.

The novelty of the paper is to shed a light on the negative linkages between government securities issuance and the amount of credit granted by banks to private sector. We find a crowding–out effect that we interpret as an outcome of Financial Repression.

As well as Italy is concerned, restrictions to financial activity operated through credit ceilings and branch restrictions which may have shrunk bank supply of financing to private sector, on the one hand, and artificially channelled bank resources to domestic assets such as the public debt, on the other hand.

Secondly, we find that a part of cross-country variability of banking deepening is explained by the legal origin of countries. As we restrict the study to the size of banking market – and not to financial systems as defined by some more comprehensive indicators - we do not identify the Anglo-Saxon legal origin as the crucial factor for promoting credit systems. According to our evidence, the German legal origin happens to be the most effective.

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Table 1 Data Definition and Sources

Sources of the statistics (key to abbreviations):

BDL: Beck, Demirguc-Kunt, and Levine (2003b).

IFS: IMF, International Financial Statistics.

LLSV: La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1997).

WDI: World Bank, World Development Indicators.

BP: OECD, Bank Profitability.

SC: OECD, Statistical Compendium.

Dependent variable

priv - claims on private sector by deposit money banks as a share of GDP, BDL.

Independent variables

res – reserve requirement calculated as ratio of domestic currency holdings and deposits with the monetary authorities to claims on other governments, non financial public enterprises, the private sector, and other banking institutions, WDI.

infl – inflation rate calculated as annual growth rate of CPI, WDI.

sdinfl – standard deviation of monthly inflation observations for the year, WDI.

gov_deb - gross government debt as a share of GDP, SC.

legor_ge - German legal origin, LLSV.

legor _fr - French legal origin, LLSV.

legor_uk - Anglo-Saxon legal origin, LLSV.

legor_sc - Scandinavian legal origin of country, LLSV.

trade – sum of exports and imports of goods and services measured a share of GDP, WDI.

GDPpc - per capita GDP (PPP, current international $), WDI.

stock - stock market capitalisation as a share of GDP, BDL.

corp - securities other than shares issued by non financial corporations, European central bank and national financial accounts.

Table 2 Country list (18 High Income OECD Countries)

1	Australia
2	Austria
3	Belgium
4	Canada
5	Finland
6	France
7	Germany
8	Japan
9	Greece
10	Italy
11	Norway
12	Netherlands
13	Portugal
14	Spain
15	Sweden
16	Switzerland
17	United Kingdom
18	United States

Table 3 Descriptive statistics

Annual data for the period 1981-1997. Dependent variable (priv) is the amount of credit granted by the bank system to the private sector (as a percentage of GDP); infl is the annual change in consumer prices; sdinfl is the standard deviation of monthly inflation observations for the year; res2 is the bank liquid reserves to bank assets ratio; gov_deb is the gross government debt (as a percentage of GDP); GDPpc is the percapita GDP; stock is the stock market capitalisation (as a percentage of GDP); legal dummies are denoted by the prefix legor_; trade is the sum of exports and imports of goods and services (as a share of GDP).

	priv	infl	sdinfl	res2	gov_deb	GDPpc	stock	trade	corp
mean	71	0.05	0.01	5.0	62	16,564	37	59	11
sd	30	0.05	0.01	8.1	29	5,043	31	29	9
min	26	-0.19	0.00	0.2	12	6,337	0	16	1
max	167	0.34	0.06	81.7	144	30,123	183	149	30

Table 4 Correlation matrix

Annual data for the period 1981-1997. Dependent variable (priv) is the amount of credit granted by the bank system to the private sector (as a percentage of GDP); infl is the annual change in consumer prices; sdinfl is the standard deviation of monthly inflation observations for the year; res2 is the bank liquid reserves to bank assets ratio; gov_deb is the gross government debt (as a percentage of GDP); GDPpc is the percapita GDP; stock is the stock market capitalisation (as a percentage of GDP); legal dummies are denoted by the prefix legor_; trade is the sum of exports and imports of goods and services (as a share of GDP); corp is the stock of securities other than shares issued by non-financial corporations.

	priv	infl	sdinfl	res2	gov_deb	GDPpc	stock	trade	corp	legor_ge	legor_fr	legor_uk	legor_sc
priv	1												
infl	-0.31	1											
sdinfl	-0.15	0.61	1										
res2	-0.26	0.49	0.34	1									
gov_deb	-0.36	-0.14	-0.12	0.02	1								
GDPpc	0.42	-0.60	-0.49	-0.49	0.15	1							
stock	0.50	-0.39	-0.27	-0.39	-0.03	0.59	1						
trade	-0.11	-0.08	-0.07	-0.15	0.36	0.02	-0.11	1					
corp	0.01	-0.12	0.08	-0.25	0.01	0.46	0.54	-0.42	1				
legor_ge	0.68	-0.30	-0.17	-0.19	-0.21	0.22	0.16		0.67	1			
legor_fr	-0.24	0.33	0.19	0.45	0.45	-0.36	-0.40	-0.08	-0.24	-0.43	1		
legor_uk	-0.16	-0.07	-0.03	-0.21	-0.08	0.16	0.42	0.29	-0.15	-0.29	-0.43	1	
legor_sc	-0.27	-0.02	-0.03	-0.14	-0.27	0.05	-0.12	-0.33	-0.27	-0.24	-0.36	-0.24	1

Table 5 - Determinants of loans to GDP ratio in OECD countries (five-year averages data)

Five-years averages for the period 81-85, 86-90, 91-95, 96-00. Dependent variable (priv) is the amount of credit granted by the bank system to the private sector (as a percentage of GDP); linfl is the logarithm of the annual change in consumer prices; lnsdinfl is the logarithm of the standard deviation of monthly inflation observation for the year; res is the bank liquid reserves to bank assets ratio; gov_deb is the gross government debt (as a percentage of GDP); stock is the stock market capitalisation (as a percentage of GDP); legal dummies are denoted by the prefix leg_; the suffix (_1) denotes the lagged term of variables; (*) indicates marginal significance at the 5%-level, and (**) at the 1% -level; FE and RE, indicate fixed effect and random effect model; First diff. is th the first difference estimator. (+) (++) point estimates of legal dummies denote differential effects with respect to leg_uk. Robust standard error are below the estimated parameters.

Dependent variable: priv

	1	2	3	4	5	6	7
	FE	*FE*	*FE*	*First diff.*	*RE*	*RE+*	*OLS+*
linfl	-9.075	1.966	3.322	-0.430	-0.291	1.511	1.595
	4.95	6.308	4.138	3.899	5.105	4.406	4.332
lnsdinfl	-0.162	8.612	6.291	9.010*	2.151	2.556	-4.783
	7.740	4.621	5.279	3.966	5.531	6.303	6.095
res	-0.215	-0.170	-0.400	-0.188	-0.423*	-0.680*	-0.629
	0.225	0.134	0.295	0.330	0.204	0.288	0.436
gov_deb		-0.323*	-0.278	-0.388*	-0.364*	-0.444**	-0.482**
		0.128	0.150	0.162	0.152	0.070	0.070
GDPpc		0.003**		0.003**			
		0.001		0.000			
stock		0.114		0.012			
		0.120		0.086			
GDPpc_1			0.002		0.001	0.001	0.001
			0.001		0.001	0.001	0.001
stock_1			0.206		0.283*	0.408*	0.555**
			0.144		0.130	0.161	0.148
legor_ge						48.903**	49.002**
						9.176	7.798
legor_fr						29.915**	33.334**
						8.286	5.898
legor_sc						-4.115	-0.348
						10.467	9.511
Constant	41.978	88.273**	108.132**		84.335**	73.606*	38.102
	33.414	20.973	27.347		26.506	36.215	38.177
N	70	68	52	48	52	52	52
							(Rsq = 0.86)

Table 6 - Determinants of loans to GDP ratio in OECD countries (annual data)

Annual data for the period 1981-1997. Dependent variable (priv) is the amount of credit granted by the bank system to the private sector (as a percentage of GDP); linfl is the logarithm of the annual change in consumer prices; lnsdinfl is the logarithm of the standard deviation of monthly inflation observation for the year; res2 is the bank liquid reserves to bank assets ratio; gov_deb is the gross government debt (as a percentage of GDP); stock is the stock market capitalisation (as a percentage of GDP); legal dummies are denoted by the prefix leg_; the suffix (_1) denotes the lagged term of variables; (*) indicates marginal significance at the 5%-level, and (**) at the 1% -level; FE and RE, indicate fixed effect and random effect model; First diff. is th the first difference estimator. (+) (++) point estimates of legal dummies denote differential effects with respect to leg_uk. Robust standard error are below estimated parameters.

Dependent variable: priv

	1	2	3	4	5	6	7	8	9
	FE	*FE*	*FE*	*First diff.*	*RE*	*RE+*	*OLS+*	*FE (time-dummies)*	*OLS (time dummies)*
linfl	-5.022**	-0.366	-0.537	0.223	-0.924	-1.334	-3.39	0.544	-1.992
	1.229	1.298	1.302	0.5	1.261	1.256	2.125	1.63	3.108
lnsdinfl	-1.338	2.425	1.516	0.075	1.426	1.322	0.174	2.765	1.043
	1.903	1.590	1.463	0.356	1.495	1.499	1.812	1.696	2.074
res	-0.879	-0.192	-0.141	-0.308	-0.106	-0.167	0.027	-0.05	-0.093
	0.427	0.198	0.183	0.176	0.185	0.232	0.294	0.245	0.352
gov_deb		-0.357**	-0.341**	-0.127*	-0.356**	-0.411**	-0.494**	-0.473*	-0.494**
		0.113	0.097	0.057	0.091	0.064	0.055	0.234	0.058
GDPpc		0.002**		0.001**				0.001	0.001
		0.000		0.000				0.003	0.001
stock		0.146		0.013				0.164	0.41**
		0.132		0.038				0.126	0.410
GDPpc_1			0.002**		0.002**	0.002**	0.001*		
			0.001		0.001	0.001	0.000		
stock_1			0.179		0.202	0.282*	0.441**		
			0.160		0.142	0.142	0.101		
legor_ge						44.600**	43.460**		44.649**
						6.587	4.962		4.648
legor_fr						27.004**	31.524**		30.440**
						4.655	3.167		3.798
legor_sc						-2.68	-0.253		-1.124
						7.092	6.248		6.379
Constant	50.584**	60.966**	58.607**		58.305**	39.773**	31.982*	82.509*	40.029*
	10.463	10.37	10.642		11.852	11.083	12.896	39.039	16.903
N	291	277	262	253	262	262	262	277	277
							(Rsq = 0.82)		(Rsq = 0.83)

Table 7 - Determinants of loans to GDP ratio in OECD countries (annual data, 1981-1989)

Annual data for the period 1981-1989. Dependent variable (priv) is the amount of credit granted by the bank system to the private sector (as a percentage of GDP); linfl is the logarithm of the annual change in consumer prices; lnsdinfl is the logarithm of the standard deviation of monthly inflation observation for the year; res is the bank liquid reserves to bank assets ratio; gov_deb is the gross government debt (as a percentage of GDP); stock is the stock market capitalisation (as a percentage of GDP); legal dummies are denoted by the prefix leg_; the suffix (_1) denotes the lagged term of variables; (**) indicates marginal significance at the 5%-level, and (*) at the 1% -level; FE and RE, indicate fixed effect and random effect model; First diff. is th the first difference estimator. (+) (++) point estimates of legal dummies denote differential effects with respect to leg_uk. Robust standard error are below estimated parameters.

Dependent variable: priv

	1	2	3	4	5	6	7	8	9
	FE	*FE*	*FE*	*First diff.*	*RE*	*RE+*	*OLS+*	*FE (time-dummies)*	*OLS (time dummies)*
linfl	-2.452	-1.811	-1.589	-0.419	-2.215	-1.096	-5.234	1.05	-4.506
	1.331	1.081	1.767	0.845	1.808	1.722	2.759	1.96	2.823
lnsdinfl	-2.397	1.798	1.031	0.342	2.026	1.568	2.313	1.392	2.671
	1.518	1.097	1.372	0.447	1.613	1.621	2.521	1.023	2.776
res	-2.040**	-0.987**	-1.150**	-0.176	-0.346	-0.483**	0.462*	-1.080**	0.702*
	0.441	0.235	0.197	0.24	0.251	0.138	0.211	0.2	0.295
gov_deb		-0.600**	-0.584*	-0.333**	-0.515**	-0.545**	-0.563**	-0.726*	-0.588**
		0.206	0.208	0.099	0.125	0.106	0.065	0.315	0.071
GDPpc		0.002*		0.001**				0.003	0.002**
		-0.001		0.000				0.002	0.001
stock		0.234		0.230**				0.196	0.445**
		0.162		0.078				0.149	0.097
GDPpc_1			0.002*		0.002**	0.002**	0.001*		
			0.001		0.000	0.001	0.000		
stock_1			0.307		0.315*	0.38	0.503**		
			0.233		0.15	0.201	0.086		
legor_ge						48.541**	41.837**		41.321**
						7.216	4.556		4.103
legor_fr						36.313**	28.543**		29.362**
						9.6	5.585		5.55
legor_sc						3.102	2.597		1.139
						8.919	4.662		4.847
Constant	53.714**	70.456**	71.018**		67.248**	45.296**	39.440*	73.640*	20.878
	7.165	6.607	7.432		14.308	13.064	17.936	32.096	21.871
N	151	137	122	116	122	122	122	137	137
							(Rsq = 0.83)		(Rsq = 0.83)

Table 8 - Determinants of loans to GDP ratio in OECD countries (annual data, 1990-1997)

Annual data for the period 1990-1997. Dependent variable (priv) is the amount of credit granted by the bank system to the private sector (as a percentage of GDP); linfl is the logarithm of the annual change in consumer prices; lnsdinfl is the logarithm of the standard deviation of monthly inflation observation for the year; res is the bank liquid reserves to bank assets ratio; gov_deb is the gross government debt (as a percentage of GDP); stock is the stock market capitalisation (as a percentage of GDP); legal dummies are denoted by the prefix leg_; the suffix (_1) denotes the lagged term of variables; (*) indicates marginal significance at the 5%-level, and (**) at the 1% -level; FE and RE, indicate fixed effect and random effect model; First diff. is th the first difference estimator. (+) (++) point estimates of legal dummies denote differential effects with respect to leg_uk. Robust standard error are below estimated parameters.

Dependent variable: priv

	1	2	3	4	5	6	7	8	9
	FE	*FE*	*FE*	*First diff.*	*RE*	*RE+*	*OLS+*	*FE (time-dummies)*	*OLS (time dummies)*
linfl	0.793	-0.357	-0.201	0.192	-0.363	-0.737	-3.742	1.984	-3.25
	1.522	0.685	0.683	0.633	0.744	0.729	2.6	1.361	3.761
lnsdinfl	-1.281	-1.93	-2.025*	-0.645	-2.059*	-1.770*	-1.389	-0.972	-0.008
	0.852	1.011	0.847	0.601	0.848	0.786	1.983	0.992	2.359
res	-0.841*	-0.625*	-0.536	-0.399	-0.583*	-0.649**	-0.818	-0.009	-0.985
	0.344	0.281	0.313	0.261	0.28	0.241	0.423	0.293	0.512
gov_deb		-0.331**	-0.361**	-0.011	-0.380**	-0.402**	-0.441**	-0.771**	-0.415**
		0.104	0.108	0.074	0.11	0.09	0.089	0.196	0.088
GDPpc		0.002		0.000				-0.004	0.000
		-0.001		0.000				0.002	0.001
stock		-0.047		-0.018				-0.143	0.406**
		0.07		0.047				0.08	0.094
GDPpc_1			0.002		0.002	0.002	0.000		
			0.001		0.001	0.001	0.001		
stock_1			-0.082		-0.038	0.011	0.409**		
			0.095		0.09	0.08	0.109		
legor_ge						38.313**	44.747**		47.603**
						14.722	7.491		6.795
legor_fr						16.238	30.205**		30.301**
						11.321	6.687		6.835
legor_sc						-15.349	-2.627		-1.754
						13.295	10.758		11.554
Constant	77.067**	63.061**	59.464**		59.124**	49.997*	45.204	205.922**	50.107
	6.103	16.988	16.779		16.062	21.397	23.539	52.897	31.736
N	140	140	140	119	140	140	140	140	140
							(Rsq = 0.83)		(Rsq = 0.84)

Table 9 - Determinants of loans to GDP ratio in OECD countries: do corporate bonds matter ? (annual data)

Annual data for the period 1981-1997. Dependent variable (priv) is the amount of credit granted by the bank system to the private sector (as a percentage of GDP); linfl is the logarithm of the annual change in consumer prices; lnsdinfl is the logarithm of the standard deviation of monthly inflation observation for the year; res is the bank liquid reserves to bank assets ratio; gov_deb is the gross government debt (as a percentage of GDP); stock is the stock market capitalisation (as a percentage of GDP); trade is the sum of expoer and imports of goods and services (as a percentage of GDP); corp is the stock of securites other than shares issued by non-financial corporations; legal dummies are denoted by the prefix leg_; the suffix (_1) denotes the lagged term of variables; (*) indicates marginal significance at the 5%-level, and (**) at the 1% -level; FE and RE, indicate fixed effect and random effect model; First diff. is th the first difference estimator. (+) (++) point estimates of legal dummies denote differential effects with respect to leg_uk. Robust standard error are below estimated parameters.

Dependent variable: priv

	1	2	3	4	5	6	7	8	9
	FE	***FE***	***FE***	***First diff.***	***RE***	***RE+***	***OLS+***	***FE (time-dummies)***	***OLS (time dummies)***
linfl	-0.429	-0.932	-1.042	0.029	-1.707	-2.947*	-4.045	1.27	-0.586
	1.964	0.764	0.979	0.83	1.045	1.373	2.737	2.054	1.926
lnsdinfl	-0.678	-0.51	-0.427	-0.548	-0.494	-0.148	0.639	-0.729	1.002
	0.95	0.903	0.799	0.629	0.872	1.013	1.360	1.158	1.906
res	-0.713**	-0.473	-0.416	-0.448	-0.498*	-0.673*	-0.916*	0.293	-1.100*
	0.13	0.233	0.248	0.301	0.247	0.331	0.417	0.403	0.423
gov_deb		-0.268*	-0.293*	0.017	-0.344**	-0.388**	-0.348**	-0.806**	-0.331**
		0.111	0.108	0.092	0.074	0.075	0.058	0.241	0.068
GDPpc		0.002		0.000				-0.007	-0.001
		0.001		0.001				0.004	0.001
stock		-0.058		-0.034				-0.119	0.367**
		0.106		0.057				0.104	0.073
GDPpc_1			0.002		0.002	0.001	0.000		
			0.001		0.001	0.001	0.001		
stock_1			-0.067		-0.034	0.139	0.382**		
			0.144		0.122	0.107	0.077		
corpbond	1.616	1.236	1.179	1.357	0.428	0.065	-0.498	0.768	-0.279
	0.886	0.811	0.762	0.385	0.611	0.545	0.309	0.794	0.309
legor_ge						28.939*	30.084**		34.923**
						13.511	5.129		4.777
legor_fr						18.632	15.569*		16.418*
						13.368	5.935		6.726
legor_sc						4.692	6.358		9.424
						13.431	5.655		5.009
Constant	59.390**	48.745	46.906		57.695**	54.668	77.449**	306.783*	98.929**
	12.475	23.185	22.99		21.604	31.132	24.378	101.521	29.776
N	115	115	115	100	115	115	115	115	115
							(Rsq = 0.78)		(Rsq = 0.80)