

**COUNTRY CREDITOR RIGHTS, INFORMATION SHARING
AND COMMERCIAL BANKS' PROFITABILITY
PERSISTENCE ACROSS THE WORLD**

**Borja Amor
María T. Tascón
José L. Fanjul**

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Country Creditor Rights, Information Sharing and Commercial Banks' Profitability Persistence across the world

Borja Amor
Universidad de Extremadura (Spain)
bamor@unex.es

María T. Tascón
Universidad de León (Spain)
m.tascon@unileon.es

José L. Fanjul
Universidad de León (Spain)
jose-luis.fanjul.suarez@unileon.es

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*Comments are welcome

ABSTRACT:

We analyze the persistence of commercial banks' profitability (Return on Equity, ROE) in different levels of creditor rights and an aggregate score of information sharing in terms of credit bureaus. After controlling for bank size and some macroeconomic variables, the results indicate that permanent profitability tend to disappear while profitability persistence is higher when creditors are well protected. Furthermore, the presence of a credit bureau (public or private) increases the persistence of ROE, but higher levels of information sharing foster competition and erode future profitability.

KEYWORDS: Return on Equity (ROE); Commercial Banks; Creditor Rights; Information Sharing; Predictive ability of Accounting.

JEL: G21, G28, M4, D4

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1 Introduction

Prior studies of profit persistence in the industrial organization literature (i.e. Mueller, 1977; Waring 1996) have found that persistence associated with industry structure is stronger than firm based persistence. Some industries, including banking, offer products that are differentiated by the information available or by the regulatory policies they are affected by. When a bank makes a loan, both parts sign a contract. Ideally, the contract specifies all future possible contingencies, which, at least in part, depend on the legal system and the information available.

Borrowers are often better informed than lenders on the "quality" of the projects that they want to develop. This paradigm of "hidden information" or "adverse selection" can generate economies of scale in lending activities, so, we can interpret financial intermediaries as coalitions whose objective is sharing information.

Recent research in the development of private credit markets across countries points to important roles of institutions, such as legal investor protection and information sharing, in supporting these markets. Both creditor protection through the legal system and information sharing through credit bureaus are associated with higher ratios of private credit to gross domestic product. Besides, credit rises after improvements in creditor rights and information sharing.

In some countries, lenders communicate information about the creditworthiness of their customers to each other. In many cases, this informational exchange is intermediated by information brokers, such as credit bureaus and credit rating agencies. Both, previous evidence and theory, predict that information sharing among lenders attenuates adverse selection and moral hazard, and can therefore increase lending and reduce default rates.

But information sharing among banks produces two types of effects. On the one hand, it tends to diminish informational asymmetries between lenders and borrowers, and thus reduces the impact of adverse selection and moral hazard on lending decisions. On the other, it stimulates more competition between banks, lowering their informational rents.

In this paper we study the effects of creditor rights protection and credit bureaus on the level and persistence of commercial banks' profitability around the world using a firm level data for more than 100 countries during the period 1996-2003. To study the influence of the creditor legal environment, we employ a measure of legal rights of creditors in these countries, the "creditor rights" index proposed by La Porta *et al.* (1997, 1998) and Djankov *et al.* (2005), for every year during this period. The index measures the legal rights of creditors against defaulting debtors in different jurisdictions, and has been previously interpreted as a measure of creditor power.

Our empirical strategy is to run ROE firm-level regressions by year, which explains the next-year ROE (profitability) in terms of current ROE (profitability persistence) and creditor rights, controlled by size, information sharing and macroeconomic variables.

The results can be briefly summarized. First, we find that the highest profitability banks are from countries without credit bureaus and with the strongest creditor rights protection. Second, lower levels of information sharing are associated with higher future profitability, supporting the idea that credit bureaus make a more competitive market. Third, permanent profitability decays while the highest persistence of ROE are reached by the banks located in countries with the strongest creditor rights protection. And finally, ROE persistence increases in economies without credit bureaus when they establish one, but declines when another credit bureau appears in the country, suggesting that competitive pressure is very strong.

Our work is related to previous studies of legal origin, information sharing in credit markets and profit persistence. Evidence in this paper differs from those in three significant respects. First, rather than considering country aggregates tests of credit markets, we build upon firm-specific measures of profitability. Second, instead of studying the effects of contemporaneous variables, we develop a test of next period's bank performance. Third, we investigate the interaction between information sharing and creditor rights protection and the implications of this interaction for commercial banks' profitability.

The next section of the paper presents the existing literature about legal environment and creditor rights. Section 3 summarizes the research about profitability persistence. Section 4 presents the data used in the study and the basic results about the effects of the variables on profitability. Section 5 examines profitability persistence across banks and countries. Section 6 concludes.

2 Literature review

There are two strands of literature specially related with our study. The ‘legal environment’ one gathers several works in which connections are established between legal protection and level of wealth. In the second strand, works identify several effects of ‘information sharing’, all of them with economic consequences for banks.

2.1 Legal environment

For centuries, economists have hypothesized about the sources of variation in property rights¹, but only very recently researchers have begun to test these theories². A growing stream of research, ‘The Law View’ holds that historically determined differences in national legal traditions continue to shape cross-country differences in property rights. In general, commercial laws come from two broad traditions: common law (English in origin) and civil law (derived from Roman law). Within the civil tradition, there are three families: French, German and Scandinavian, and the resulting laws reflect the influence of their families and the individual country revisions.

Countries with poorer investor protection, measured by both the character of legal rules and the quality of law enforcement, have smaller and narrower capital markets (La Porta

¹ For instance, Adam Smith (1776) said *“When the law does not enforce the performance of contracts, it puts all borrowers nearly upon the same footing with bankrupts or people of doubtful credit in better regulated countries. The uncertainty of recovering his money makes the lender exact the same usurious interest which is usually required from bankrupts”*

² Levine (2005) reviews recent research about the theory and empirical evidence supporting and refuting the law and endowment views of property rights.

et al., 1997). In particular, French civil law countries have both the weakest investor protection and the least developed capital markets (both equity and debt), especially as compared to common law countries.

There are evidences that performance of courts is determined by how the law regulates their operation (called ‘procedural formalism’ by Djankov *et al.*, 2003). Richer countries have higher quality courts and higher procedural formalism is a strong predictor of longer duration of dispute resolution. It also predicts lower enforceability contracts, higher corruption, as well as lower honesty, consistency, and fairness of the system. Another effect of judicial efficiency is a reduction of banks’ lending spreads (Laeven and Majnoni, 2005).

For creditors, it is important to know how rules cover the respect for security of the loan and the ability to grab assets in case of loan default. So, differences in legal protections of investors are important to explain why firms are financed and owned differently in different countries. La Porta *et al.* (1998) examine legal rules covering protection of corporate shareholders and creditors, the origin of these rules, and the quality of their enforcement in 49 countries. They find that common-law countries have the strongest, and French civil law countries the weakest legal protections of investors, with German and Scandinavian civil law countries located in the middle. Concentration of ownership of shares in the largest public companies is negatively related to investor protections, consistent with the hypothesis that small, diversified shareholders are unlikely to be important in countries that fail to protect their rights.

Creditor rights are more complex than shareholder rights because there may be different types of creditors, with different interests, and protecting the rights of some creditors reduces the rights of others. On the other hand, there are two general creditor strategies of dealing with a defaulting firm: liquidation and reorganization, which require different effective rights. Consequently, La Porta *et al.* (1998) score creditor rights in both cases and add up the scores to create a creditor rights index, using five creditor rights variables.

Some researchers have emphasized that culture proxies are also helpful in understanding how investor rights are enforced across countries. Stulz and Williamson

(2003) show that a country's principal religion predicts the cross-sectional variation in creditor rights better than a country's natural openness to international trade, its language, its income per capita, or the origin of its legal system. Catholic countries protect the rights of creditors less than Protestant countries and a country's natural openness to international trade mitigates the influence of religion on creditor rights.

But Djankov *et al.* (2005), using data from 129 countries, show that religious variables are no longer significant when the legal origin is added. In their paper, the data make clear that credit market institutions have a pronounced legal origin effect, with common law countries having sharply higher creditor rights scores than French civil law countries. The latter, in contrast, have a much higher incidence of public credit registries than the former. The differences persist over long periods of time, so there is little convergence in creditor rights scores, or in information institutions among legal origins. These results also point to a beneficial role of public credit registries in poorer French legal origin countries. Both the creditor rights scores, and the incidence of private credit registries are higher in the richer countries. But creditor rights are particularly important for private credit in the richer countries, whereas credit registries matter in the poorer countries.

In sum, this section shows that the quality of legal protection helps to explain the property rights, which are influenced by the legal origin. Richer countries and common law countries have the bigger capital markets and the strongest legal protection, in contrast with the weakest protection showed by French civil law countries and poorer countries. The existence of public registries that permits the information sharing between lenders improves the system and mitigates the lesser legal protection.

The main consequence for our research interest is that worse creditor rights protection places banks in a better bargaining position. Larger lending spreads in countries where judicial systems are not so efficient is a good sign of it.

2.2 Information Sharing

Asymmetric information may prevent the efficient allocation in credit markets, therefore, information sharing is an important factor. Obviously, a good customer prefers a regime which allows banks to share information and a bad customer prefers no information sharing (Niemeyer, 2003). In the last decade, a growing stream of theoretical³ research on information sharing in credit markets has appeared.

Trying to fill the gap in banking literature about the identification of the factors that lead to endogenous communication between lenders, Pagano and Jappelli (1993) analyze the consumer credit market from an international and historical point of view, and present a model with adverse selection and contestable credit markets, where lenders' incentives to share information about borrowers are positively related to the mobility and heterogeneity of borrowers, to the size of the credit market, and to advances in information technology; such incentives are instead reduced by the fear of competition from potential entrants. Also, they found that information sharing increases the volume of lending when adverse selection is so severe that safe borrowers drop out of the market. So, the work makes clear that credit bureaus tend to diminish informational asymmetries between lenders and borrowers, and thus, the impact of adverse selection and moral hazard on lending decisions is reduced.

Another important remark of Pagano and Jappelli (1993) is that when banks supplies information about its own customers to a competitor, using credit bureaus, the competitor can compete more aggressively, so monopoly profits will thus be reduced. This effect reduces the expected gain from information sharing and could dissuade from sharing information. Only if lenders are well protected by barriers to entry, they should be more willing to share information.

In this line, Gehrig and Stenbacka (2000) show a model in which lenders are symmetrically informed initially. Also, they consider constellations in which banks will become informational monopolists at stage 2, allowing banks to compete for clients in period 1. In this situation the prospect of future rents intensifies competition in period 1.

³ Empirical works are few and mainly based on questionnaires with a cross-country perspective

Using the standard Hotelling framework they find that lenders' overall profits are highest if they can commit to share information. At the same time entrepreneurial incentives to reduce repayment probabilities are lowest under information sharing. Hence, the authors interpret information sharing in credit markets as a potentially collusive device.

In other words, information sharing agreements tend to increase the intensity of competition in future periods and, thus, reduce the value of informational rents in current competition. Their work emphasizes that a reduction in informational rents will also reduce the intensity of competition in the current period, thereby reducing competitive pressure in current credit markets.

Padilla and Pagano (1997) present a two-period model with imperfectly competitive banks and heterogeneous entrepreneurs that deals with the trade-off that determines the banks' willingness to share information. If banks have an informational monopoly about their clients, borrowers may curtail their effort level to maximize their expected utility for fear of being exploited via high interest rates in the future. Banks can correct this incentive problem by committing to share private information with other lenders. The fiercer competition triggered by information sharing lowers future interest rates and future profits of banks. But, provided banks retain an initial informational advantage, their current profits are raised by the borrowers' higher effort. The bank decision to share information affects credit market competition, interest rates, volume of lending, and social welfare.

Using a new, purpose-built data set on private credit bureaus and public credit registers, Jappelli and Pagano (2002) find that bank lending is higher and credit risk is lower in countries where lenders share information, regardless of the private or public nature of the information sharing mechanism⁴. They also find that public intervention is more likely where private arrangements have not arisen spontaneously and creditor rights are poorly protected.

⁴ Like Jappelli and Pagano (2002), Kallberg and Udell (2003) find evidence that formal information sharing contributes positively to the functioning of credit markets.

Returning to the 'disciplinary effect' of information, Padilla and Pagano (2000) study the different types of information shared. Using a simple two-period model of banking with moral hazard and adverse selection, they establish some results. First, information helps lenders to find bad risks and thereby reduce adverse selection (Pagano and Jappelli, 1993). Second, it can lower the informational rents that banks extract from borrowers and thereby increase entrepreneurs' incentives to perform (Padilla and Pagano, 1997). Finally, when borrowers know that default information is divulged, they have greater incentive to repay, so as to maintain a good reputation with the generality of lenders. More recently, Brown and Zehnder (2005) examine the impact of a public credit registry on the repayment behavior of borrowers. In their model, when there is a market where repeat transactions are possible, a credit registry is not necessary to sustain high market performance. In such an environment relationship, banking enforces repayment even when lenders cannot share information, so that there is little value added of a public credit registry.

Based on questionnaires directed to private credit bureaus and central banks, on direct interviews and on official sources, Jappelli and Pagano (2000) describe the operation of credit bureaus and public credit registers in Europe, extracting potential lessons for upgrading credit registers in other countries. They find a set of important issues. First, European privacy protection laws affect greatly the amount and type of information shared between lenders⁵. Second, credit bureaus tend to originate from local lenders. Third, there are powerful forces pushing towards consolidation of the credit bureaus industry. This process (which reflects a "natural monopoly") has been accelerated by technological factors and by the increasing international integration of capital markets.

On the whole, previous research has shown four important effects of information sharing. First, the existence of credit bureaus improves the banks' knowledge of applicants' characteristics, and allows better estimations of repayments probabilities, which, at least partially, solves the adverse selection problem reducing default rates.

⁵ The activities of credit bureaus are regulated almost everywhere to prevent violations of privacy. Jappelli and Pagano (2000) explain the implications of the Directive 95/46/EC of the European Parliament on 'the protection of individuals with regard to the processing of personal data and on the free movement of such data'. EU Directives creates a minimum common standard on privacy protection.

Second, credit bureaus may reduce the banks' appropriation of informational rents. The informational advantage confers to banks some market power over their customers, so several banks may be very profitable in a context of no information sharing.

Third, credit bureaus act as a mechanism that disciplines borrowers in order to maintain a good reputation with the generality of lenders. This effect reduces the moral hazard problem.

And finally, the degree of privacy protection has historically affected the development of credit bureaus. On the other hand, public intervention is more likely where creditor rights are poorly protected.

3 Creditor Rights, Information Sharing and Commercial Banks' Performance

Modern industrial organization theory proposes that industry structure itself results from firm behaviour and competitive interaction. However, some controversies exist about the influence of corporate and industry effects on competitive position. A relevant work of Schmalensee (1985) attributes positive industry-level profitability to the collusion or entry barriers.

More recently, Waring (1996) has shown that persistence of abnormal returns differs widely and systematically across industries. He finds support to informational impediments to imitation, expropriation by labour, switching costs, rivalry and economies of scale for explaining persistence in manufacturing industries. In a related work, McGahan and Porter (1997) revisit the influence of industry, business-specific, and corporate-parent influences on profitability for the US economy as a whole, as well as in broad economic sectors. They find that industry effects account for a smaller proportion of profit variance in manufacturing, but a larger proportion in lodging/entertainment, services, wholesale/retail trade, and transportation.

Returning to the banking industry, Mathisen and Buchs (2005) find evidences for a non-competitive market structure in the Ghanaian banking system⁶, which may be hampering financial intermediation. The structure, as well as the other market characteristics, constitutes an indirect barrier to entry thereby shielding the large profits in the Ghanaian banking system. They suggest that non-transparent fee structure of the banks help to shield the bank market structure from competition.

In financial firm services, profitability persistence may reflect the existence of impediments to competition and informational opacity, which generate market power. So, the existence of credit bureaus may reduce the banks' appropriation of informational rents.

Furthermore, creditors are more likely to finance credit-constrained firms when credit markets are concentrated because it is easier for these creditors to internalize the benefits of assisting the firms (Petersen and Rajan, 1995).

Without barriers of entry and asymmetric information, relatively high performance by a bank would be eliminated reasonably quickly as other financial firms enter in the market. Similarly, a firm with bad performance would be forced by competitive pressures to exit the industry.

From a legal point of view, jurisdictions with lower incremental fixed costs of introducing and administering new regulations should regulate more. This implies that regulation spreads from higher to lower population jurisdictions, and that jurisdictions that build up transferable regulatory capabilities should regulate more intensely (Mulligan and Shleifer, 2005). Therefore, we can expect more regulations in civil law countries, where the incremental fixed costs are lower⁷. Administrative and enforcement costs include enumerating the population subject to the draft, setting up offices, verifying qualifications for exemptions and policing the system itself to assure fairness and avoid corruption. From this point of view, regulation is an increasing return activity, so, as the country improves the development, we can expect the existence of

⁶ Ghanaian banks' pre-tax returns on assets and equity are among the highest in Sub-Saharan Africa

⁷ Mulligan and Shleifer (2005) argue that pervasive administrative state, introduced in France by its Revolution, lowered the fixed costs of incremental regulations.

public mechanisms to share information more efficiently with administrative and enforcement costs lowering and with a reduction of banks' profitability persistence.

In addition to the level of competitiveness and the information asymmetries, persistence may also reflect some sensitivity to regional or macroeconomic shocks⁸. Therefore, it is necessary to control for this effects.

While information sharing and macroeconomic shocks may affect banks' earnings, improvements in judicial efficiency also affect through increasing aggregate lending, by opening the credit market to borrowers with little collateral. However, the impact of judicial efficiency on the average interest rate is ambiguous. Interest rates can either increase or decrease depending on the competitive structure of banks and some other factors reported by Jappelli *et al.* (2005).

However, we expect more profitability persistence in countries without information sharing (credit bureaus may foster competition) and with weak creditor rights protection. As the countries establish credit bureaus and improve creditor rights, informational asymmetries tend to disappear and lenders can do their business safer, adding competitive pressures to the lending market.

In the next sections, we explore these predictions empirically.

4 Data

Our analysis is performed on data from a sample of commercial banks from 1996 to 2003. In this section we describe the empirical variables and the data.

A. Variable Definitions

We gather data on 103 countries and 796 banks from 1996 to 2003. Table 1 describes the variables used and their sources. We employ three firm level variables (FROE,

⁸ In the case of Ganna, Mathisen and Buchs (2005) suggest that this is one of the drivers of high profitability.

ROE, and logta) from BankScope Database and six country variables, from IMF and Shleifer's Databases.

Profitability is measured by the Return on Equity (Earnings After Taxes / Book Value of Equity) of the current year (ROE) and on the following year (computed as $FROE_t = ROE_{t+1}$).

To control for the bank's size we employ the logarithm of total assets (logta). Size may be an important determinant of profitability and previous studies (Demirgüç-Kunt et al., 2004; Allen and Gale, 2004; Goddard et al., 2004) indicates that may be a proxy of economies of scale or scope, efficiency gains, the adoption of entry-detering strategies, or the exercise of other forms of market power. All these advantages lead us to predict a positive sign for the relation with ROE.

The creditor rights index (cr) follows that constructed by La Porta *et al.* (1997, 1998) and Djankov *et al.* (2005) to 133 countries⁹. The creditor rights index measures four powers of secured lenders in bankruptcy. First, whether there are restrictions, such as creditor consent, when a debtor files for reorganization; second, whether secured creditors are able to seize their collateral after the petition for reorganization is approved (in other words, whether there is no 'automatic stay' or 'asset freeze' imposed by the court); third, whether secured creditors are paid first out of the proceeds of liquidating a bankrupt firm; finally, whether a manager is responsible for running the business during the reorganization. A value of one is added to the index when a country's laws and regulations provide each of these powers to secured lenders. The creditor rights index aggregates the scores and varies between 0 (poor creditor rights) and 4 (strong creditor rights).

The information sharing score (agreginfo) measures the tendency to share information between lenders. We construct this score, from 0 (no information sharing) to 2 (strongest information sharing), adding one (two) if the country has a Public Registry or a Private Bureau (both) in the current year. In other words, cr presents a value of 0 (no

⁹ Data available in the following webpage:
http://post.economics.harvard.edu/faculty/shleifer/Data/dataset_creditpaper_Nov_05.xls

information sharing), 1 (Public Registry or Private Bureau) or 2 (Public Registry and Private Bureau). We obtain this information from Shleifer's Database

The interest rate data (interest) are from the IMF's International Financial Statistics (line 60p) and measure the interest rate of bank's prime lending in the country (year average), expressed in nominal terms¹⁰, because firm level data are in nominal terms too.

To control for other country variables, we use the annual percent change of gross domestic product in constant prices (gdp), the logarithm of gross domestic product per capita in constant prices (loggdp) and the annual percent change of inflation (inf). All of these variables are from IMF World Economic Outlook.

B. Summary of the Data

Table 2 shows the summary statistics of the variables. To exclude spurious financial ratios, we deleted commercial banks with ROE in the two percent top and bottom. This leaves us with 5,099 commercial bank-year observations in the sample.

Sample period contains moments with high instability in the markets, such as Russian crisis in the late of 90's. For this reason, control variables are very disperse, showing important economy shocks that may affect banks' earnings.

Taken together, summary statistics present highly volatile bank profitability, with moderate levels of creditor rights across the world, but with an important presence of credit bureaus.

Table 3 reports the number of banks in each level of creditor rights score by year, showing a stable behavior in the protection throughout the countries. But profitability is very different from one country to another, as Table 4 shows. This table lists the average ROE, the standard deviation and the number of observations in each country. The most profitable cases are in Zambia with a ROE of 44.6%. This country presents a

¹⁰ This is the reason why in Table 2 a maximum value of interest rate of 146% is reached. In order to compensate distortions due to it, we include inflation as a control variable.

strong level of creditor rights, but, in contrast, it doesn't exist a credit bureau, so, banks in this country might be able to obtain strong monopolistic rents.

On the other side, we have those that evolve badly, located in Asia (Thailand and Japan). These are countries with medium levels of creditor rights and the existence of credit bureaus. It is probably that more competition exists here than in other countries without information sharing. Another possible explanation points to the macroeconomic shocks (in the sample period of time, Asia was affected by macroeconomic shocks that could have eroded bank's earnings).

As Table 5 shows, the more creditor rights exist, the more profitability the banks get. We have 330 cases in countries with the weakest creditor rights and an average ROE of 10.6 %, compared with 333 banks in countries with strongest creditor rights and an average ROE of 17.6%. These results are consistent year by year and reflect that banking business is safer and more profitable in those countries where more creditor protection exists.

In Table 6 we present data classified by the level of information sharing. As expected, the more information, the less profitability banks achieve. Year by year, banks in countries with no information sharing are more profitable, according to the existence of informational asymmetries as a source of monopolistic rents. The pool sample presents an average ROE of 14.7%, for the banks in countries without credit bureaus, 10.3 %, if a private or a public bureau exists, and 9.1%, if both types exist.

To summarize the main results of this section, Figure 1 shows that the highest profitability corresponds to banks in countries without information sharing (information is a barrier to the competition) and with the strongest creditor rights protection.

5 Cross-Country Credit Rights and Commercial Banks' Profitability

In this section, we present the cross-sectional results on the determinants of ROE in 103 countries. Our empirical test is based on a cross section analysis of commercial banks' future profitability of bank “*i*” in country “*c*” (measured in terms of following ROE) and assesses the sensitivity of such profitability to the current ROE (persistence) of bank “*i*” in country “*c*”, to the creditor's rights, to the bank size, to the information sharing of the country, and to a number of other country-specific variables. The dependent variable is represented by the following year's return on equity at the individual bank level.

In other words, we run the following regression:

$$ROE_{i,t+1} = \alpha_0 + \alpha_1 ROE_{i,t} + \alpha_2 cr_{ci,t} + \alpha_3 agreginfo_{ci,t} + \alpha_4 \log ta_{i,t} + \sum_{j=1}^4 \alpha_{4+j} Economy_{ci,t-1}^j + \varepsilon_{it}$$

In this expression, as α_1 comes near to the unit, ROE is more persistent. Economy control variables are:

- Economy growth: gross domestic product (annual change)
- Economy wealth: log gdp per capita
- Primary source of earnings (interest rates): lending rates
- Financial instability: inflation (annual rate)

From the previous expression, we could advance to a more general and standard expression for analysing ROE evolution in the long run:

$$ROE_{i,t+1} = (1 - \phi) ROE_p + \phi ROE_{i,t} + \varepsilon_{i,t}$$

Where ϕ is an estimate of profitability persistence, and ROE_p is a new variable which measures permanent profitability. According to economical reasoning, ROE_p should tend to zero supposed a competitive market. From Table 8, Panel A, we can extract:

	Pooled sample	cr = 0	cr = 1	cr = 2	cr = 3	cr = 4
ROE_p	0.2014 (i.e., 0.088/(1-0.563))	0.565	0.154	0.277	0.12	-0.093

Looking at the figure for the pooled sample, we can say that a permanent profitability exists, which would indicate that there are still economic rents, either due to the absence of a competitive market or due to the lack of a long run equilibrium. But the situation clearly varies for different levels of the creditor rights index. With a better creditor protection, permanent profitability is lower, though profitability persistence is even growing. In other words, in countries where creditor rights' score is worse permanent profitability reaches a higher proportion, while a better creditor rights' score makes profitability more dependant of previous year one.

If we only pay attention to profitability, a panel data model could be a better specification. But the introduction of the creditor's rights (cr) and information sharing (agreginfo) variables imposes several restrictions. Legal and political systems and policies on information sharing or creditors' protection vary very little across time because they depend on cultural factors and the legal origin of countries. Thus, in our sample, given the limited time period (less than a decade), these variables present scarce time-variation (i.e. less than five countries in the sample present a small variation in cr). In other words, laws vary a lot across countries, in part because of differences in legal origin, but very little on a long-term basis, in a specific country. However, firm-level data change year by year (i.e. ROE of bank "i"), so we run cross-sectional regressions by year, at a bank level, taking into account the country conditions.

As a first assessment of whether return on equity is higher and more persistent in countries with better creditor rights, we look at the correlation between variables. The correlation matrix is reported in Table 7. We find that the more creditor rights protection, the more current and future profitability. Higher levels of the following year's profitability are associated with lower levels of information shared, supporting the idea that credit bureaus add competition pressure to lenders, but contrary to our predictions, bigger size is not associated with higher profitability. Furthermore, the correlations show that macroeconomic instability, as proxied by inflation, is positive associated with current and future profitability, while gross domestic product per capita is negative associated with ROE, indicating that richer countries, with stable economies, have more competitive markets, with fewer business opportunities to lenders. The

correlations among these national characteristics suggest that it is important to control them in assessing the impact of current ROE on the next-period ROE.

After matching the available information for explanatory and dependent variables we end up with a sample size of 4340 bank-year for the estimation of the FROE regression. While some variables, such as *gdp*, are available for all sampled banks, others, such as ROE, have a smaller coverage. As a result of lower data availability, the number of banks for which we were able to obtain data for the explanatory and dependent variables was limited to a total of 3356 bank-year. Table 8 presents regressions of next period ROE on current ROE, size, creditor rights index, information sharing score and economy control variables.

First, consider the pooled sample in Panel A. Current ROE explains a large amount of next period ROE (highly persistence). Also, some macroeconomic variables are important. More specifically, the existence of current high interests increases future profitability and, as the country becomes richer (in terms of gross domestic product per capita), future ROEs decline. It may reflect a more competitive environment in development countries that erode monopolistic rents. Furthermore, the existence of Credit Bureaus lowers future ROEs, although the creditor right index is not statistically significant.

To explore the impact of creditor rights protection more deeply, we run cross sectional regressions by each level of creditor rights index. In countries with little protection, high interest rates are associated with a decline in the next period profitability. By contrast, in countries with more creditor protection, interest rates make a positive contribution to profitability. This is consistent with the idea that little protection may increase default rates and the volatility of lenders earnings.

As for the profitability persistence, it is not clear how it changes in different contexts. For this reason, we make additional cross-sectional time series regressions, not reported here, and we find that the highest persistence of current ROE corresponds to banks in countries with the strongest creditor rights protection. This is consistent with the cross-sectional regressions reported in Table 8, Panel A: the coefficient of current ROE in countries with a creditor right value of 4 is the highest (0.65).

Now, consider the influence of credit bureaus. As shown in Panel B of Table 8, persistence of ROE increases from economies without credit bureaus to countries with a private or public one. However, when both exist, current ROE is less persistent. This may reflect that banks obtain big informative benefits in environments of strong informational asymmetries; but improvements in the availability of information add more competitive pressure and lower the informational rents of established banks, when those asymmetries are relaxed.

Furthermore, in countries without credit bureaus, better creditor rights tend to increase future bank profitability. This is consistent with banks operating in strong informational asymmetries but facing a safer market. Panel B also indicates that higher gross domestic product gives an impulse to the next period's return on equity, in countries with informative restrictions. However, in the presence of credit bureaus, richer countries tend to exhibit less commercial banks' profitability. This supports the idea that in richer countries, information tends to increase the competition pressure, whereas, in poorer countries, banks' earnings are affected by increases in wealth more than by increases in competition.

Figure 2 plots ROE persistence of all banks, grouped by the strength of creditor rights, showing that there is more persistence in the strongest. To make the interactions between creditor rights, information sharing and ROE persistence clear, Figure 3 displays the same as Figure 2, but clustering by information sharing score. This figure shows that the gap of ROE persistence in stronger and weaker creditor rights contexts is bigger in countries without information sharing than in countries with credit bureaus.

On the other hand, as we can see in Figure 4, banks in countries with strong creditor rights tend to show more stable (and positive) earnings, while banks' profitability takes more extreme values in countries with little creditor protection.

Figure 5 depicts those big differences in average profitability between strongest and weakest creditor rights, and between no credit bureaus and many credit bureaus.

Taken together, the evidence found suggests a causal relationship between creditor rights protection (legal system) and informational asymmetries to current and future

commercial bank profitability. In general, our results show that economy shocks and other conditions may change the degree of competition in the market.

6 Concluding Remarks

The quality of legal protection helps to explain the property rights, which are influenced by the legal origin. A richer common law country has the biggest capital markets and the strongest legal protection, but informational asymmetries must be considered to assess the effects over credit markets and profitability of lenders. In this context, credit bureaus improve the banks knowledge of the applicant's characteristics, solving the adverse selection problem and reducing moral hazard.

However, in countries without credit bureaus, the informational advantage confers banks some market power over their customers, therefore, several banks may be more profitable in this context of informative asymmetry.

This paper presents evidence on the effects of legal protection and informative barriers over banks' profitability. We study the effects of the creditor rights protection and the existence of credit bureaus in the level and persistence of commercial banks' profitability around the world, using firm-level data for more than a hundred of countries, during the period 1996-2003.

As hypothesized, our results show that the highest profitable banks come from countries without credit bureaus, but the evidence found is not so clear for the creditor rights protection. Lower levels of information sharing are associated with higher future profitability, supporting the idea that information sharing agreements tend to increase the intensity of competition. As for the creditor rights protection, the hypothesized worse bargaining power of banks when protection is stronger would mean a competition increase, but this effect seems to be compensated by the parallel effect on the capital and credit markets development. In fact, our result is consistent with the idea that countries with better investor protection develop bigger capital and credit markets, but it is necessary to control them by informational asymmetries. We present the cross-sectional results by creditor rights index and information sharing aggregate score. The

size of the coefficient for current ROE, profitability persistence's proxy varies widely across these groups. In general, banks from countries with the strongest creditor rights protection and without information sharing seem to show more persistence in profitability. At the same time, permanent profitability tends to disappear as creditor protection increases, making ROE more dependant of the previous year's value.

On the other hand, banks operating in countries with high interest rates tend to show high levels of profitability. However, as the country becomes richer, future ROEs decline, possibly because of competition increase. Also, these differences might reflect a significant variation in domestic government financial needs. In other words, banks may employ government securities as a source of large steady profits. In addition, large deficit financing through the issuance of treasury bills crowd out the private sector in capturing banks' investments and may also put pressure on interest rates, making access to bank lending even more difficult for the private sector.

Finally, we present evidence that profitability persistence tends to increase from countries without credit bureaus to countries that establish one. By contrast, persistence of profitability diminishes from countries with one credit bureau to countries with more credit bureaus. In other words, our results suggest that when a credit bureau is established, credit markets become bigger and more active, improving the banks' earnings. But after some time (and a certain degree of information), other financial firms enter the market and reduce the banks' appropriation of informational rents and the gains of a bigger market.

Nevertheless, it is important to note that variations in the persistence (and levels) of profitability could arise from sources other than competition. Although macroeconomic shocks were controlled for in this study, there could be estimation biases arising from: the inclusion of only commercial banks; the use of accounting rates of return; or the short length of the time series data.

In conclusion, despite the above limitations, these empirical results shed light on the persistence of profitability in different contexts of informational asymmetries and creditor rights protection.

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Appendix

Table 1. Variable Description and Source

Variable	Description	Source
FROE	Return on Equity in the following year	BankScope
ROE	Return on Equity (from 1996 to 2003)	BankScope
logta	Bank's Total Assets (Logarithm)	BankScope
interest	Interest rate, banks prime lending, per cent per annum, period average (nominal terms)	International Financial Statistics Yearbook's 2004 and 2005, IMF line 60p
gdp	Gross domestic product, constant prices, annual percent change	IMF World Economic Outlook (September 2005 Edition)
inf	Inflation, annual percent change	IMF World Economic Outlook (September 2005 Edition)
loggdppc	Gross domestic product per capita (Logarithm), constant prices	IMF World Economic Outlook (September 2005 Edition)
agreginfo	Information Sharing Score (Public Registry or Private Bureau) Values of cr = 0 (no information sharing), 1 (public registry or private bureau), 2 (public registry and private bureau)	Shleifer's Database
cr	Creditor rights aggregate score	Shleifer's Database

Table 2. Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
FROE	4340	0.109	0.117	-0.446	0.491
ROE	5099	0.110	0.118	-0.446	0.491
logta	5324	14.452	2.189	7.601	20.648
interest	4479	0.138	0.119	0.018	1.468
gdp	5156	0.032	0.025	-0.105	0.135
inf	5156	0.043	0.095	-0.036	3.650
loggdppc	5156	12.060	2.267	6.993	15.218
agreginfo	5326	0.987	0.630	0	2
cr	5019	2.029	1.029	0	4

Table 3. Number of Banks in Each Level of Creditor Rights Score by Year

year	cr					Total
	0	1	2	3	4	
1996	31	99	149	135	44	458
1997	33	109	164	152	47	505
1998	35	113	184	220	46	598
1999	39	122	211	232	44	648
2000	47	216	223	158	45	689
2001	50	224	249	152	45	720
2002	51	220	262	150	44	727
2003	47	132	315	144	36	674
Total	333	1,235	1,757	1,343	351	5,019

Table 4. ROE average by Country

Country	Mean	Std. Dev.	Freq.	Country	Mean	Std. Dev.	Freq.
ARGENTINA	0.073	0.116	24	MALAYSIA	0.113	0.050	31
AUSTRALIA	0.134	0.038	71	MALTA	0.099	0.069	32
AUSTRIA	0.085	0.022	30	MAURITIUS	0.162	0.024	15
BAHRAIN	0.118	0.056	36	MEXICO	0.056	0.316	11
BANGLADESH	0.167	0.127	107	MOLDOVA REP. OF	0.206	0.100	36
BARBADOS	0.135	0.040	8	MONACO	0.186	0.040	8
BELGIUM	0.083	0.253	3	MOROCCO	0.102	0.044	38
BERMUDA	0.123	0.063	15	NAMIBIA	0.261	0.038	7
BOLIVIA	0.077	0.113	32	NEPAL	0.224	0.135	65
BOTSWANA	0.349	0.094	16	NETHERLANDS	0.153	0.028	8
BRAZIL	0.116	0.144	78	NICARAGUA	0.268	0.076	8
CANADA	0.133	0.036	72	NIGERIA	0.203	0.123	119
CHILE	0.132	0.107	44	NORWAY	-0.006	0.136	11
CHINA-PEOPLE'S REP.	0.159	0.100	37	OMAN	0.147	0.088	28
COLOMBIA	0.096	0.121	61	PAKISTAN	0.117	0.111	105
COSTA RICA	0.126	0.065	33	PANAMA	0.144	0.046	20
CROATIA	0.068	0.106	123	PARAGUAY	0.086	0.146	8
CYPRUS	0.065	0.114	24	PERU	0.094	0.101	53
CZECH REPUBLIC	0.138	0.114	6	PHILIPPINES	0.073	0.070	101
DENMARK	0.106	0.047	292	POLAND	0.077	0.123	86
ECUADOR	0.084	0.126	33	PORTUGAL	0.155	0.041	27
EGYPT	0.135	0.113	167	QATAR	0.163	0.054	31
EL SALVADOR	0.093	0.103	40	ROMANIA	0.148	0.056	7
ESTONIA	0.222	0.131	8	RUSSIAN FEDERATION	0.129	0.178	20
FINLAND	0.140	0.080	20	SAINT LUCIA	0.115	0.054	4
FRANCE	0.120	0.084	70	SAUDI ARABIA	0.172	0.065	56
GERMANY	0.058	0.108	96	SINGAPORE	0.095	0.023	16
GHANA	0.331	0.111	18	SLOVAKIA	0.133	0.167	18
GREECE	0.120	0.089	68	SLOVENIA	0.052	0.127	22
HONDURAS	0.129	0.093	81	SOUTH AFRICA	0.157	0.170	7
HONG KONG	0.115	0.077	56	SPAIN	0.147	0.035	111
HUNGARY	0.183	0.147	16	SRI LANKA	0.138	0.053	38
ICELAND	0.125	0.050	18	ST. KITTS AND NEVIS	0.105	0.055	8
INDIA	0.177	0.082	215	SUDAN	0.160	0.116	31
INDONESIA	0.104	0.128	129	SURINAME	0.197	0.106	16
IRAN	0.109	0.029	2	SWAZILAND	0.105	0.139	8
IRELAND	0.175	0.049	32	SWEDEN	0.165	0.039	16
ISRAEL	0.062	0.042	69	SWITZERLAND	0.086	0.055	43
ITALY	0.073	0.100	143	TAIWAN	0.006	0.127	138
JAMAICA	0.178	0.125	23	THAILAND	-0.012	0.188	43
JAPAN	-0.008	0.094	489	TRINIDAD AND TOBAGO	0.223	0.043	24
JORDAN	0.078	0.080	69	TUNISIA	0.114	0.047	73
KAZAKHSTAN	0.154	0.108	66	TURKEY	0.150	0.160	41
KENYA	0.172	0.175	51	UKRAINE	0.083	0.099	8
KOREA REP. OF	0.044	0.127	50	UNITED ARAB EMIRATES	0.154	0.036	39
KUWAIT	0.140	0.066	48	UNITED KINGDOM	0.108	0.154	31
LATVIA	0.062	0.050	5	USA	0.104	0.076	67
LEBANON	0.169	0.067	41	UZBEKISTAN	0.035	0.017	3
LIECHTENSTEIN	0.072	0.081	2	VENEZUELA	0.220	0.144	68
LITHUANIA	0.043	0.155	23	ZAMBIA	0.446	0.038	2
LUXEMBOURG	0.162	0.028	12	ZIMBABWE	0.273	0.093	7
MALAWI	0.333	0.066	14	Total	0.110	0.118	5099

Table 5. Means, Standard Deviations and Frequencies of ROE by Year and Creditor Rights Score

		cr					
year		0	1	2	3	4	Total
1996	Mean	0.124	0.134	0.151	0.113	0.196	0.138
	Std. Dev.	0.120	0.096	0.111	0.077	0.108	0.101
	Freq.	30	93	137	130	41	431
1997	Mean	0.116	0.127	0.148	0.095	0.182	0.129
	Std. Dev.	0.102	0.095	0.126	0.106	0.138	0.116
	Freq.	33	105	157	145	46	486
1998	Mean	0.088	0.107	0.126	0.066	0.165	0.102
	Std. Dev.	0.115	0.100	0.122	0.127	0.109	0.122
	Freq.	35	108	171	197	44	555
1999	Mean	0.092	0.115	0.135	0.074	0.137	0.106
	Std. Dev.	0.128	0.111	0.112	0.107	0.159	0.118
	Freq.	38	114	191	226	42	611
2000	Mean	0.076	0.068	0.119	0.103	0.189	0.101
	Std. Dev.	0.141	0.109	0.129	0.111	0.123	0.123
	Freq.	47	208	213	156	43	667
2001	Mean	0.099	0.047	0.111	0.094	0.175	0.091
	Std. Dev.	0.094	0.122	0.139	0.105	0.132	0.129
	Freq.	50	213	239	145	44	691
2002	Mean	0.122	0.049	0.101	0.105	0.152	0.090
	Std. Dev.	0.080	0.124	0.140	0.091	0.119	0.125
	Freq.	51	212	253	142	40	698
2003	Mean	0.136	0.121	0.110	0.137	0.156	0.122
	Std. Dev.	0.082	0.110	0.106	0.101	0.101	0.105
	Freq.	46	130	311	140	33	660
Total	Mean	0.106	0.085	0.121	0.095	0.170	0.108
	Std. Dev.	0.109	0.117	0.125	0.107	0.126	0.119
	Freq.	330	1183	1672	1281	333	4799

Note: Total Averages, and the interaction between "creditors' right index" and "information sharing" produces statistically significant results.

Table 6. Means, Standard Deviations and Frequencies of ROE by Year and Information Sharing Score

		agreginfo			
year		0	1	2	Total
1996	Mean	0.158	0.137	0.112	0.139
	Std. Dev.	0.112	0.102	0.073	0.102
	Freq.	138	248	76	462
1997	Mean	0.155	0.123	0.109	0.130
	Std. Dev.	0.113	0.121	0.094	0.115
	Freq.	159	267	95	521
1998	Mean	0.130	0.101	0.086	0.104
	Std. Dev.	0.105	0.127	0.111	0.120
	Freq.	117	366	107	590
1999	Mean	0.141	0.104	0.098	0.109
	Std. Dev.	0.123	0.122	0.087	0.116
	Freq.	120	392	136	648
2000	Mean	0.141	0.100	0.084	0.104
	Std. Dev.	0.110	0.124	0.113	0.121
	Freq.	119	445	144	708
2001	Mean	0.137	0.089	0.065	0.093
	Std. Dev.	0.094	0.130	0.130	0.127
	Freq.	131	455	145	731
2002	Mean	0.147	0.082	0.073	0.092
	Std. Dev.	0.103	0.121	0.137	0.124
	Freq.	130	466	143	739
2003	Mean	0.165	0.114	0.118	0.123
	Std. Dev.	0.082	0.099	0.123	0.103
	Freq.	113	441	146	700
Total	Mean	0.147	0.103	0.091	0.110
	Std. Dev.	0.106	0.120	0.114	0.118
	Freq.	1027	3080	992	5099

Table 7. Correlation Matrix: Pairwise Correlation Coefficients Between the Variables

	FROE	ROE	logta	interest	gdp	inf	loggdppc	agreginfo	cr
FROE	1								
ROE	0.6100*	1							
logta	-0.1488*	-0.1352*	1						
interest	0.1953*	0.2187*	-0.3389*	1					
gdp	0.1109*	0.1350*	-0.0562*	0.1278*	1				
inf	0.1215*	0.1220*	-0.0365*	0.2722*	-0.0389*	1			
loggdppc	-0.0881*	-0.0936*	0.1426*	-0.1825*	-0.3257*	-0.1027*	1		
agreginfo	-0.1554*	-0.1493*	0.2271*	0.0251	0.0036	-0.1439*	-0.1346*	1	
cr	0.0798*	0.0892*	-0.0858*	-0.0385*	0.0086	0.1116*	-0.0669*	-0.1130*	1

* Significant at 5%

Table 8. Following ROE Regressions

Panel A. Regressions by Creditor Rights Index

	pooled sample FROE	cr=0 FROE	cr=1 FROE	cr=2 FROE	cr=3 FROE	cr=4 FROE
ROE	0.563 (23.44)**	0.63 (8.55)**	0.351 (6.24)**	0.563 (14.38)**	0.45 (9.35)**	0.656 (7.50)**
logta	-0.001 (1.37)	-0.005 (2.41)*	0.002 (1.69)	-0.002 (0.94)	0.003 (2.22)*	0.003 (0.76)
interest	0.047 (2.43)*	-0.176 (2.83)**	0.042 (1.33)	-0.074 (2.18)*	0.219 (3.99)**	0.031 (0.25)
gdp	0.069 (0.95)	0.137 (0.38)	-0.184 (1.29)	-0.115 (0.7)	0.238 (2.00)*	-0.453 (2.71)**
inf	0.041 (1.3)	-0.446 (1.42)	0.329 (4.87)**	0.045 (0.77)	-0.139 (2.47)*	0.031 (0.31)
loggdppc	-0.002 (3.03)**	-0.005 (1.39)	-0.008 (4.42)**	-0.001 (0.43)	-0.007 (3.47)**	0.005 (1.33)
agreginfo	-0.01 (3.36)**	0.006 (0.61)	-0.003 (0.25)	-0.017 (3.79)**	-0.013 (2.24)*	-0.013 (0.84)
cr	0.002 (1.31)					
Constant	0.088 (5.46)**	0.209 (3.51)**	0.1 (2.90)**	0.121 (3.59)**	0.066 (2.75)**	-0.032 (0.34)
Observations	3356	212	875	1078	916	275
R-squared	0.39	0.52	0.32	0.39	0.35	0.50

Robust t statistics in parentheses

* significant at 5%; ** significant at 1%

Panel B. Regressions by Information Sharing Score

Information Sharing

	POOLED	agreginfo = 0	agreginfo = 1	agreginfo = 2
ROE	0,563 (23.44)**	0,496 (6.99)**	0,554 (18.91)**	0,477 (7.89)**
logta	-0,001 (1,37)	0,004 (1,93)	-0,001 (1,17)	0,002 (1,3)
interest	0,047 (2.43)*	0,08 (1,24)	0,096 (2.82)**	-0,066 (1,93)
gdp	0,069 (0,95)	0,029 (0,19)	-0,017 (0,18)	0,081 (0,42)
inf	0,041 (1,3)	0,083 (2.37)*	-0,035 (0,7)	0,128 (0,74)
loggdppc	-0,002 (3.03)**	0,01 (4.22)**	-0,005 (4.79)**	-0,007 (3.18)**
agreginfo	-0,01 (3.36)**			
cr	0,002 (1,31)	0,012 (2.74)**	0,004 (1,96)	-0,024 (4.47)**
Constant	0,088 (5.46)**	-0,162 (3.64)**	0,106 (5.43)**	0,153 (3.81)**
Observations	3356	557	2246	553
R-squared	0,39	0,41	0,41	0,27

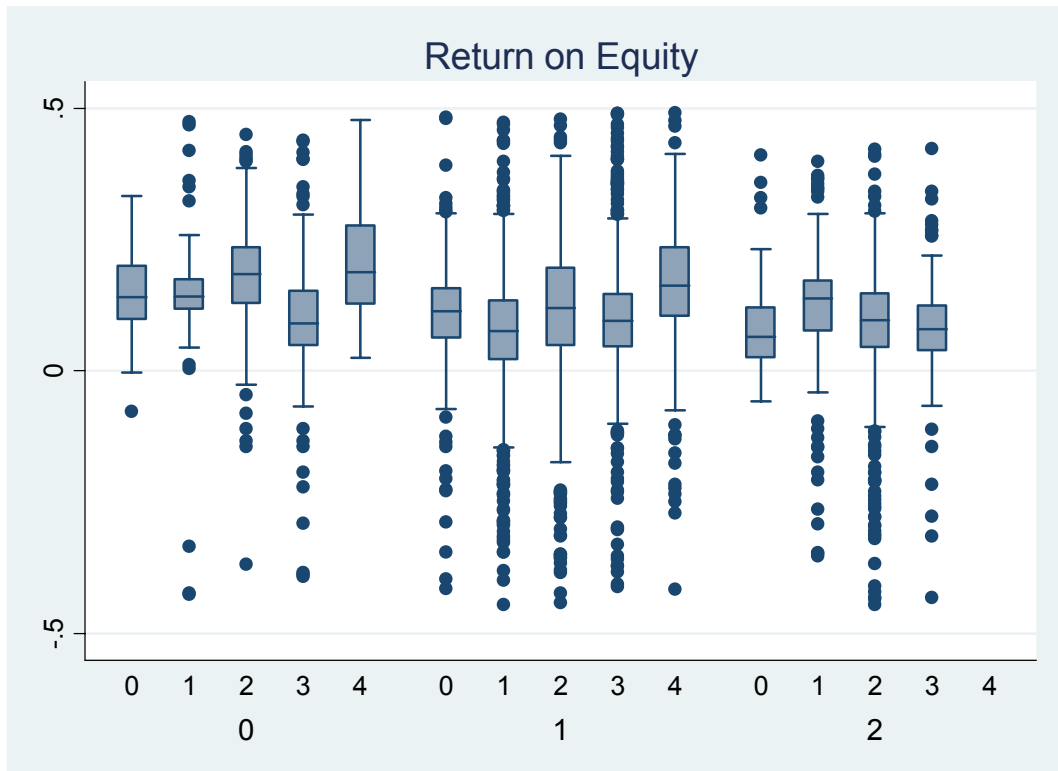
We obtained individual bank data for the estimation of these models from the BankScope Database collected from 1996 to 2003. Data for Credit Right Score and Information Sharing Score are from Shleifer Database.

Dependent Variable: FROE

Robust t statistics in parentheses

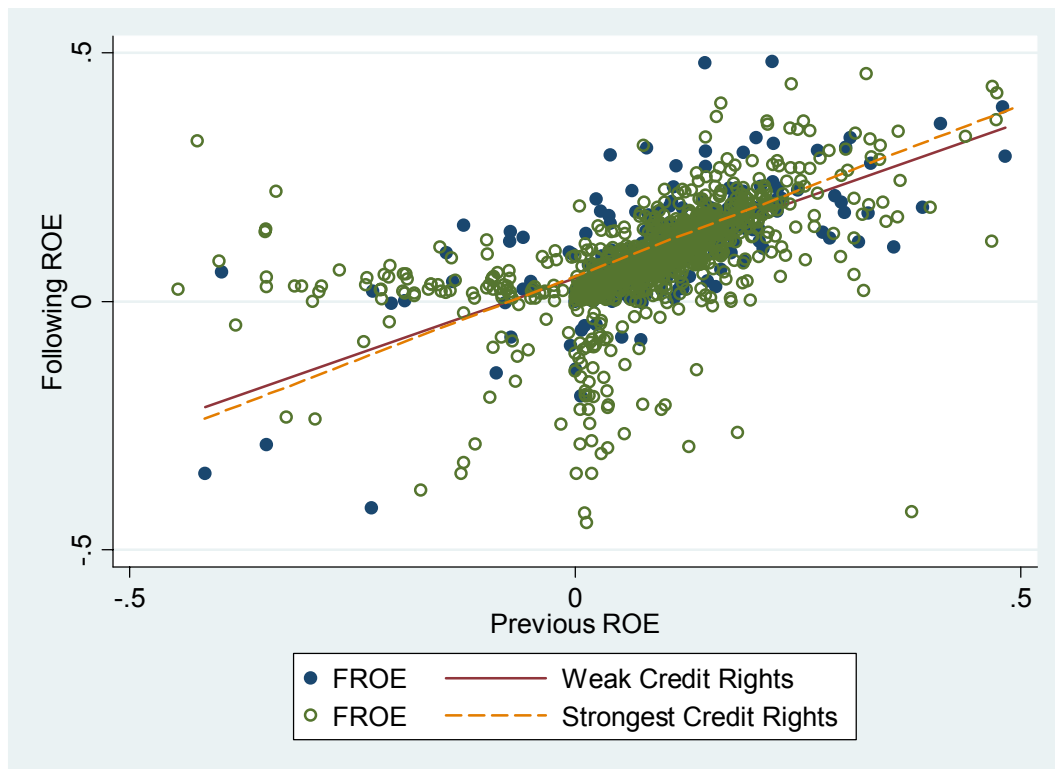
* significant at 5%; ** significant at 1%

Figure 1. Graph Box. Return on Equity by Credit Rights Score –from 0 (Weak) to 4 (Strong)– and Information Sharing Score –from 0 (Weak) to 2 (Strong)–



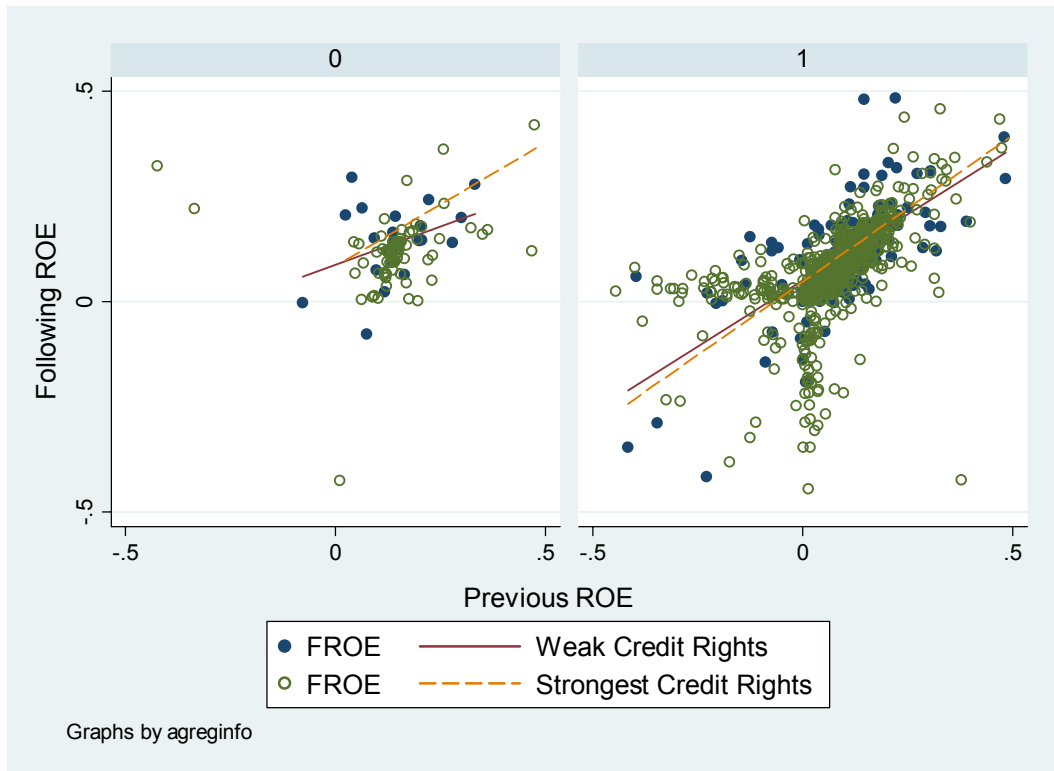
The X-Axis shows two levels. The first one (from 0 to 4) represents Creditor Rights Aggregate Score, and the second one (from 0 to 2) the Information Sharing Score (Note: No cases found with cr: 4 and agreginfo: 2)

Figure 2. Scatter Plot. ROE of the Weak Creditor Rights Cases (cr = 0) and the Strongest (cr = 4)



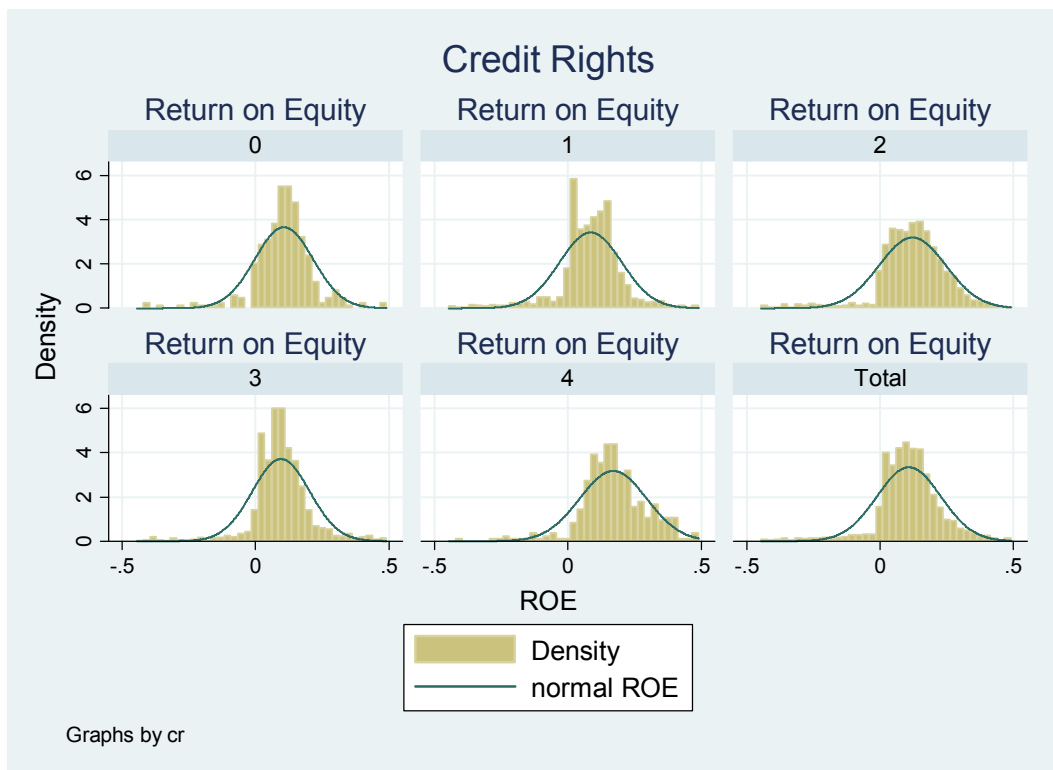
Banks in countries with strongest creditor rights tend to show more earnings persistence than Banks in countries with the weakest creditor rights.

Figure 3. Scatterplot. ROE of the Weak Credit Rights Cases (cr = 0) and the Strongest (cr = 4), Separated in Groups by Information Sharing Score (0 and 1)



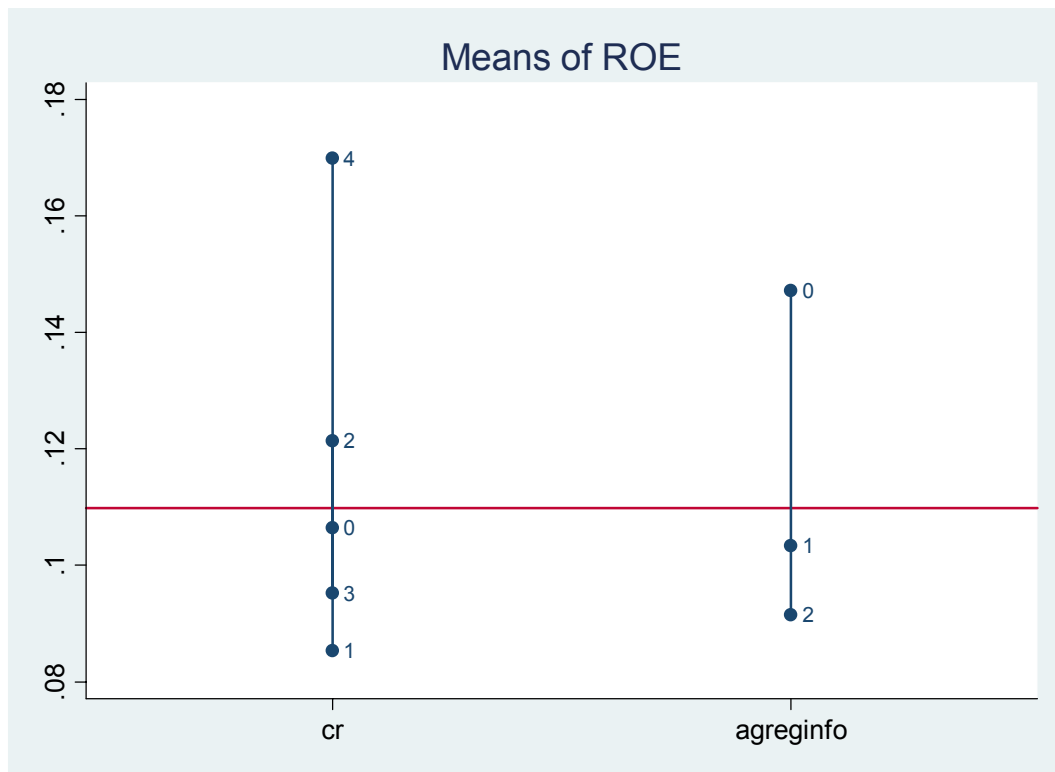
Note: No cases found with cr: 4 and agreginfo: 2
 Making groups by information sharing score shows a bigger gap in profitability persistence between banks from countries with strongest creditor rights to banks in countries with the weakest creditor rights.

Figure 4. ROE's Histograms by Creditor Rights Score



Banks in countries with strong creditor rights tend to show more stable (and positive) earnings. In countries with little creditor protection banks' profitability shows more extreme values

Figure 5. Means of ROE by Creditor Rights and Sharing Information Scores



The Y-Axis shows Average Return on Equity (ROE) and the X-Axis shows the Creditor Rights Index and the Information Sharing Aggregate Score. The highest profitability corresponds to the group of banks in countries with the strongest creditor rights protection and countries without credit bureaus.

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