Creditor Protection, Information Sharing and the Development of the Credit Market in the Mercosul Countries

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ABSTRACT: This work analyses how the degree of creditor protection and the existence of credit information systems impact the development of the credit market of the countries which make up Mercosul. Using quantile regression to approach the problem empirically, the results obtained indicate that despite the effect being positive for all Mercosul countries, those with biggest development index in the credit market are more sensible to an increase both in the creditor rights and the implementation of a credit information system.

Keywords: Credit market, creditor protection, information sharing, quantile regression.

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1. INTRODUÇÃO

T his study analyses the relevance of the creditor protection and of the existence of a credit information system (hereafter referred to as "information sharing") in the development of the credit market in the countries which integrate MERCOSUL.

The credit market has a fundamental role in the life of the economic agents (companies and consumers), contributing to economy's smooth performance.

For the companies, it allows them a wider access to investments, adding value. Credit also has an important "consumption softening" function for consumers.

It works as a mechanism of consumption anticipation, according to the individual's needs, generating welfare improvements.

With a more astringent access to credit, its role in economy is not fulfilled. Such restrictions of the credit market hamper the development of economy as a whole.

The difficult access to credit hampers the possibility of investments in new projects for companies without enough cash flow for consolidation.
King and Levine (1993) and Beck et al (2000) point to the existence of a strong connection between financial development and economic growth.

In this way we can conclude that an improvement in creditor protection, through bankruptcy laws, and in the system of information on credit history can directly influence the financial development and, consequently, in the economic growth.

The development of the credit market has been studied through two important theories. The first, called power theory, says that what's relevant for the expansion of credit is the power given to creditors, that is, places where creditors have more powers to repossess their loans (through guarantee, liquidation of assets in court etc), would reduce the moral hazard problem and, thus, would be more prone to develop financing activities.[1]

The second approach, called "information theory", says that the relevant factor is the information that creditors have on the history of payment of the debts of potential debtors, which would allow to reduce the problem of adverse selection.[2]

Researches on the development of the credit market point to an important role of the legal systems as legal creditor protection, and credit agencies providing support and boosting the financial development.

La Porta et al. (1997, 1998) show that countries with legal systems which provide strong creditor protection have a financial market which is wider and more developed, than systems where the legal system offers a weak creditor protection.

This happens because, where there's strong creditor protection, investors have more ease to repossess the money lent, reducing the risk of debtor defaulting, fomenting loans and financings in the economy, and consequently promoting the development of the credit market.

According to Araujo and Funchal (2005), the improvement in the bankruptcy system in a country – which determines the level of creditor protection – brings direct consequences for the capital costs of companies and for the development of the credit market.

A law which allows more creditor protection increases the amount recovered by the creditors in case of bankruptcy (in expected value), decreasing loan risk, reducing the interest rates.

As a consequence, it allows that projects previously not-financed start being operationalized, increasing the credit volume and the investments in the economy.[3]

Considering the informational effect in the availability of credit, Jappelli and Pagano (2000) and Sapienza (2002) conclude that the presence of information history about payment of debts have a positive impact on the credit market.

Djankov et al. (2007), analyzing both factors, find that a stronger creditor protection and better credit information system are linked to more developed credit markets.

Moreover, they conclude that the private credit tends to increase as creditor protection increases and with the creation of credit information systems.

This article adds to this literature, addressing the different sensibilities in the credit markets of the Mercosul economies both in regards to changes in creditor protection and the creation of credit information systems.

To evaluate the impact of institutional changes in creditor protection and in information sharing for Mercosul countries, the empirical approach to be used is quantile regression, in a sampling which covers data from private credit institutions from 129 countries.

With this method it's possible to explain relations of the credit market development, in terms of creditor protection and information sharing for the different levels of credit market development which exist within Mercosul, estimating the specific effects of each country.

Quantile regression was chosen in detriment of the method of Ordinary Least Squares, more commonly used, because it allows us to analyze how each country chosen from the sample answers to the independent variables, instead of providing only one regression line for the average case, as in the method of the Ordinary Least Squares.

As a result, we find that both interest variables – creditor protection and information sharing – were statistically significant for all Mercosul countries.

Moreover, it was possible to find that for the Mercosul countries the sensibility of the credit market to both variables is as higher as the market gets more developed, but this is not a generalized truth.

Because for extremely high development levels, the sensibility to creditor protection and to information systems decreases.

Since all Mercosul countries already have credit information systems, the largest margin for gains would come from reformations that would aim to increase creditor protection.

The rest of the article is split in the following way: section 2 describes the data base used and the research methodology; section 3 describes the results; and finally section 4 will present the conclusions of this study.

2. DATA USED AND EMPIRICAL METHODOLOGY

In this article, we used data from 129 countries. Table 1 carefully describes all variables used and their sources.

Our dependent variable – credit market – is defined by the proportion of private credit in the economy regarding GDP.

Private credit data were obtained from FMI's International Financial Statistics, lines 22d and 42d, which measures the credit volume of the private sector provided by commercial banks and other financial institutions.

The GDP variable was extracted from line 99b.

Creditor protection was measured in terms of the countries' bankruptcy laws. As a creditor protection measure, we'll use the index built by La Porta, Lopez-de-Silanes, Shleifer

and Vishny (1997) and computed by Banco Mundial (Doing Business 2004) which sums up the creditor right in a bankruptcy process. The index of creditor rights of La Porta et al (1997) is composed by the sum of the following sub-indexes:

- Equal to one if creditors with warranties are paid first and zero otherwise;
- Equal to one if the manager doesn't stay in the company in case of reorganization and zero otherwise;
- Equal to one if there's no "automatic stay" imposed by the courts (that is, if insured creditors can enjoy their warranties after the appeal for reorganization being approved) and zero otherwise;
- Equal to one if there are restrictions to the debtor choosing the reorganization alone, with consent of the creditors, and zero otherwise.

So, the creditor protection index equals zero when protection is minimal and equals four when it's at its maximum.

The information sharing variable is a dummy, and indicates the presence or absence of public records or private agencies in the country. The variable equals 1 if there are credit records in the country and zero otherwise.

A public record or private agencies collect the permanent information from credit takers in the financial systems and make them available to the financial institutions.

Besides the abovementioned variables, we also used a set of variables to control the individual characteristics of each country in the sample, as follows: GDP growth per capita; inflation; contract enforcement, measured in days; legal origin; and religion.

First, we use the per capita GDP growth, since economies with bigger growth tend to have bigger demand for credit.

Secondly, we used the number of days to implement a contract as a proxy for justice's efficiency, since in theory, debt contracts have more validity in more efficient legal systems.

Thirdly, we control by inflation, since inflation can devaluate the stock of debts whir aren't indexed to inflation indicators.

Finally, we use legal origin and per religion to control specific characteristics of each country, such as formation of the legal code and culture.

Please notice that, despite all Mercosul countries having credit information records, in most of them the level of creditor protection is low. Thus, the biggest margin for economic gains would come from reformations in the bankruptcy laws, which would tend to change the level of creditor protection.

Since the main objective of this work is to analyze how the factors creditor protection and information sharing relate with the different development levels of the credit market in the Mercosul countries, we will use the method known as quantile regression.

The quantile regression technique, introduced by Koenker and Bassett (1978), allows us to estimate all the conditional distribution of the dependant variable (credit market), through the distribution quantiles.

We can obtain a regression for each quantile of concern, obtaining a more complete mapping of the impact of creditor protection and information sharing about the development of the credit market, while the method of Ordinary Least Squares gives us only the average. Thus, quantile regression gives us more complete information about the distribution of private credit/GDP conditioned to creditor protection and information sharing.

Table 1: Description of Variables

Variable	Description
Creditor protection	An index which aggregates the creditor rights, following La Porta and others (1998). The score is attributed when each one of the following creditor rights are defined by laws: first, there are restrictions, creditor consent or minimal dividends, for a debtor to make the reorganization. Second, if insured creditors can use their warranties after the appeal for reorganization is approved, that is, there is no "automatic stay" or "asset freeze." Third, creditors are firstly paid in liquidation processes of a bankrupt company, opposed to the other creditors such as the Government and the employees. Finally, if the administrator, and not the manager, is responsible for the management of the business during reorganization. The index varies from 0 (low creditor rights) to 4 (strong creditor rights). Source: World Bank - Doing Business 2004
Public record	The variable equals 1 if there are public credit records in the country; on the contrary, 0. A public record is defined as a database belonging to the public authorities (usually the Central Bank or the Banking Supervisory Authority), which collect the permanent information of the credit takers in the financial systems and make them available for the financial institutions. Source: Djankov et al. (2007)
Private Agency	A variable equals 1 if there are private credit agencies in the country, case contrary, 0. A private agency is defined as a private commercial company or a non-governmental organization which keeps a permanent database of lenders in the financial system, and its main role is to facilitate the exchange of information between banks and financial institutions. Reports from private credit companies, which collect information from public sources but not from banks and financial institutions, operate in many other countries, but were not considered here. Source: Djankov et al. (2007)
Information sharing	A variable equals 1 if there are both public records and private agencies operating in the country; case contrary, 0. Source: Djankov et al. (2007)
Private credit/GDP	Credit index from deposit in financial institutions for the private sector (IFS lines 22d and 42d) regarding GDP (IFS line 99b). Average from 1999 to 2003. Source: IMF International Financial Statistics September 2004.
GDP Growth per capita	Annual growth average of the gross domestic product per capita. Average from 1979 to 2003. Source: World Development Indicators 2004.
Inflation	Annual Inflation in percentage, GDP deflator. Average from 1999 to 2003. Source: World Development Indicators 2004.
Contract enforcement days	The number of days to perform the payment which is being litigated in the courts (in logs). Data is based in Djankov's methodology and others' (2003), but describes the number of calendar days to make effective a contract with debit in the amount of 50% of the country's per capita GDP. Source: Djankov et al. (2007)
Legal Origin	A dummy variable which identifies the legal origin of the company's laws or of the commercial code from each country. The five origins are English, French, German, Nordic and Socialist. Source: Djankov et al. (2007)
Religion	A dummy variable which identifies the religion practiced by the biggest proportion of the population. There are nine religions: Atheist, Buddhist, Catholic, Hindu, Indigenous, Judaism, Muslim, Orthodox and Protestant Christianity. Source: Djankov et al. (2007).

Table 2 describes the values of the relevant variables to be analyzed via quantile regression per Mercosul country: creditor protection, information sharing, private credit/GDP, growth of per capita GDP, contract enforcement days, inflation, legal origin and religion, of all countries which will be analyzed.

Table 2: Data

	Argentina	Brazil	Paraguay	Uruguay
Private Credit/GDP	0.19	0.35	0.24	0.53
Creditor protection	1	1	1	3
Information Sharing	1	1	1	1
Growth Per capita GDP	-0,284	0,87	0,72	0,75
Incdays	6,25	6,34	5,65	6,43
Inflation	7,83	9,33	10,17	10,01
Legal origin	French	French	French	French
Religion	Catholic	Catholic	Catholic	Catholic

The use of Quantile Regressions presents some other advantages in relation to the OLS model:

- It makes possible to characterize the entire conditional distribution of a response variable from a set of regressors;
- Provides more robust estimates even with the presence of outliers;
- Can be used when the distribution is not Gaussian;
- Uses the totality of data to estimate the angular coefficient of the quantiles.

Based on the proposed methodology, it is assumed that y_i (i = 1,..., n), is a sample of observations of private credit/GDP, and that X_i is a K x 1 vector which is constituted by the independent variables. The model of quantile regression can, then, be defined as follows:

$$y_i = X_i^{'}\beta_\theta + u_{\theta i}$$

$$Q_\theta(y_i : X_i) = X_i^{'}\beta_\theta, \theta \in (0,1)$$

where Q_θ (yi : Xi) represents the quantile Θ of the dependant variable private credit/GDP, given the regressor vector.

The quantile regression Θ can be defined as the solution to the following problem:

$$\min_\beta \frac{1}{n}\left[\sum_{i:y_i \geq X_i^{'}\beta} \theta\left|y_i - X_i^{'}\beta_\theta\right| + \sum_{i:y_i \leq X_i^{'}\beta} (1-\theta)\left|y_i - X_i^{'}\beta_\theta\right|\right] = \min_\beta \frac{1}{n}\sum_{i=1}^{n} \rho_\theta(u_{\theta i})$$

where $\rho_\theta(.)$ is known as the check function.

Intuitively, we can analyze the coefficient estimated via quantile equation in the same way that the OLS coefficient, no longer as an average effect, but as a specific sensibility to the quantile of the dependant variable. Thus, the coefficient can be interpreted through the partial derivate of the conditional quantile in relation to each specific regressor. In other words, we can say that this is a marginal change in the -nth conditional quantile due to a change in the regressor.

3. RESULTS

Table 3 shows the estimates obtained by the method of Ordinary Least Squares (OLS) and by Quantile regression (QR) in the quantiles of the dependant variable corresponding to the countries belonging to Mercosul: Brazil, Argentina, Paraguay e Uruguay; and, also, in the mean. The dependant variable is the proportion of private credit/GDP of the countries.

The results reported in Table 3 indicate that for every country studied, an increase in creditor protection impacts positively the credit market, and, besides that, countries with

higher indexes of development of credit market – measured by the proportion private credit/GDP – are even more sensitive to an increase in creditor protection.[4]

Note that reforms which change the level of creditor protection in countries such as Brazil or Uruguay, which are above the median in level of credit market development, the effect of gain of one point generates in both economies an increase of 0,13 in the proportion private credit/GDP.

In relative terms this means that an expansion of 37% and 24% (0,13 of 0,35 and 0,13 of 0,53) of the credit market, respectively. For Argentina, however, despite the positive impact, the magnitude in absolute terms is smaller than in the other countries.

Table 3: Results by OLS and QR. Dependant Variable: Private Credit /GDP

| Independent Variable	OLS	QR 0.39 (Argentina)	QR 0.45 (Paraguai)	QR 0.5 (Median)	QR 0.59 (Brazil)	QR 0.69 (Uruguay)
Creditor protection	**0.08***	**0.08***	**0.12***	**0.12***	**0.13***	**0.13***
	(0.007)	(0.000)	(0.000)	(0.000)	(0.000)	(0.002)
Information Sharing	**0.28***	**0.17**	**0.27***	**0.28***	**0.28***	**0.34***
	(0.000)	(0.038)	(0.000)	(0.000)	(0.000)	(0.003)
Per capita GDP Growth	**0.02**	**0.01**	**0.01**	**0.01**	**0.01**	**0.04**
	(0.305)	(0.373)	(0.415)	(0.473)	(0.221)	(0.025)
Inadev	**-0.21***	**-0.20***	**-0.20***	**-0.20***	**-0.26***	**-0.28***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Inflation	**-0.00**	**-0.00**	**-0.00***	**-0.00***	**-0.00**	**-0.00**
	(0.330)	(0.260)	(0.053)	(0.071)	(0.104)	(0.373)
English Legal origin	**0.13**	**0.024**	**0.11**	**0.12**	**0.13**	**-0.03**
	(0.165)	(0.869)	(0.396)	(0.329)	(0.304)	(0.847)
French Legal origin	**-0.00**	**0.07**	**0.07**	**0.08**	**0.09**	**-0.08**
	(0.972)	(0.623)	(0.564)	(0.537)	(0.476)	(0.658)
German Legal origin	**0.08**	**0.094**	**0.02**	**0.07**	**0.16**	**0.02**
	(0.501)	(0.559)	(0.890)	(0.621)	(0.262)	(0.910)
Scandinavian Legal origin	**0.25**	**0.27**	**0.24**	**0.37***	**0.31**	**0.03**
	(0.112)	(0.205)	(0.198)	(0.057)	(0.126)	(0.900)
Buddhist	**0.05**	**-0.01**	**0.05**	**0.07**	**0.01**	**-0.14**
	(0.713)	(0.917)	(0.458)	(0.488)	(0.929)	(0.412)
Catholic	**0.16***	**0.10**	**0.10**	**0.10**	**0.07**	**0.08**
	(0.082)	(0.221)	(0.181)	(0.165)	(0.369)	(0.529)
Muslim	**0.00**	**-0.06**	**-0.05**	**-0.04**	**-0.06**	**-0.01**
	(0.568)	(0.423)	(0.458)	(0.570)	(0.469)	(0.933)
Orthodox	**-0.06**	**-0.17**	**-0.12**	**-0.11**	**0.02**	**-0.08**
	(0.557)	(0.196)	(0.337)	(0.391)	(0.861)	(0.602)

Note: coefficients in bold and p-value between parentheses. The constant of each regression wasn't reported. ***significant at the 1% level; **significant at the 5% level; *significant at the 10% level.

Thus, it's possible to conclude that in Mercosul, the same increase in creditor protection affords higher credit market expansion in the countries which already present higher credit market development. The intuition for this result is connected to gains in scale which might exist in economies with bigger credit markets, having more creditors benefited and, therefore, in absolute terms a more accentuated expansion of the market.

Note that if we made an analysis based in the OLS method, this result particular to each economy wouldn't be possible. We would have the same estimate of the impact of

changes in creditor protection in the credit market for all countries, underestimating it for Paraguay, Brazil and Uruguay. This means that the incentive for reforms which protect the creditor would be lessened due to a simplification in the estimation method, without considering the particularities of each country.

Graph 1 illustrates sensitivity of the credit market to a change in the level of creditor protection for all the distribution quantiles. The horizontal axis are the quantiles of the credit market: the closest to one it is, the more developed is the market. The vertical axis represents sensitivity (β for each quantile) of the credit market to a variation in creditor protection.
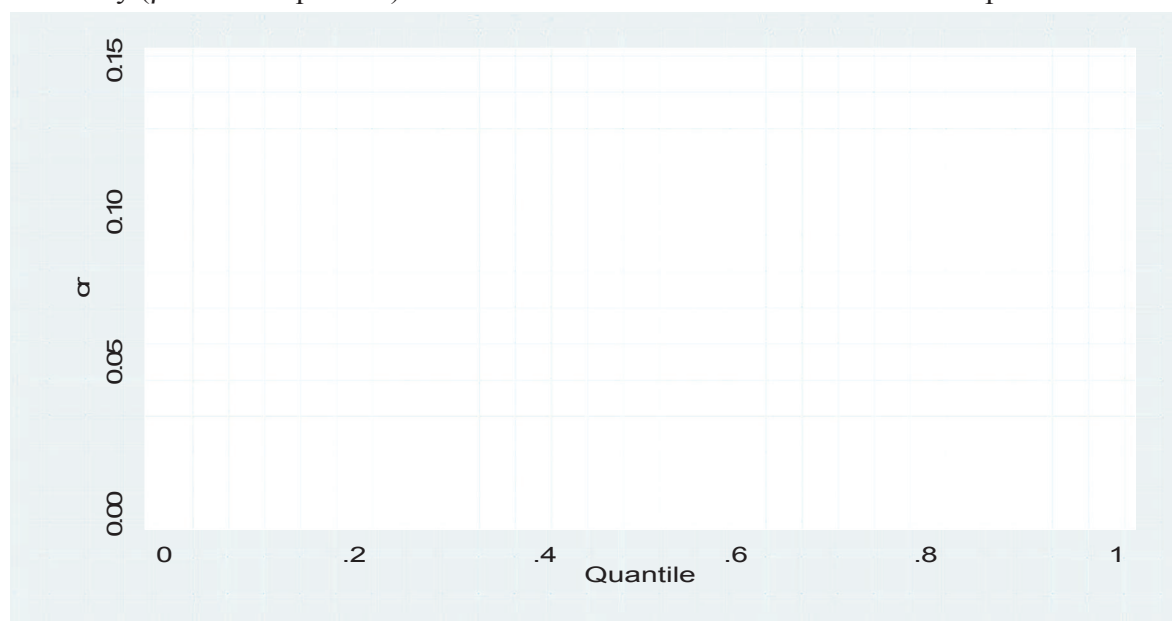
Graph 1: Creditor rights and proportion of private credit/GDP

Note that sensitivity is positive for all the quantiles and growing with credit market development for almost the entire distribution, probably due to gain in scale, as discussed previously. However, countries which present extremely developed credit market –private credit/GDP proportion above approximately 0.83 – start having decreasing sensitivity to the increase in creditor protection.

In this case, the increase in creditor protection would exert an effect of increase of the credit market at lower rates, as the market would become more developed. This can be explained by the fact that the development of the credit market is related to high levels of creditor protection. So, the gain in the margin of an increase in creditor protection which is already at a high level would be less relevant for the economy.

Analyzing the explanatory variable, information sharing, an important characteristic that we can deduce from the results of Table 3, is that the existence of the credit information system has a positive impact, economically and statistically significant in the expansion of credit market for all the quantiles studied. Note that its effect varies from 0,17 (for Argentina) to 0,34 (for Uruguay).

However, at the same time in which the variable information sharing generates a strong impact in the size of the credit market, we can conclude that, comparatively to creditor protection, it becomes less relevant for the Mercosul countries in general. This happens because all countries already have credit information systems, and, therefore, it wouldn't be   a

policy instrument which would bring gains, different from creditor protection, where all the Mercosul countries have room for reforms, and can increase it significantly.

Graph 2 illustrates the sensitivity of the credit market to the introduction of an information system for all the distribution quantiles.

The horizontal axis are the credit market quantiles. The vertical axis represents the sensitivity (β for each quantile) of the credit market to the introduction of the information system.

Note that, just like creditor protection, sensitivity is positive for all the quantiles, and growing with the credit market development for almost the entire distribution, probably also due to the gain in scale.
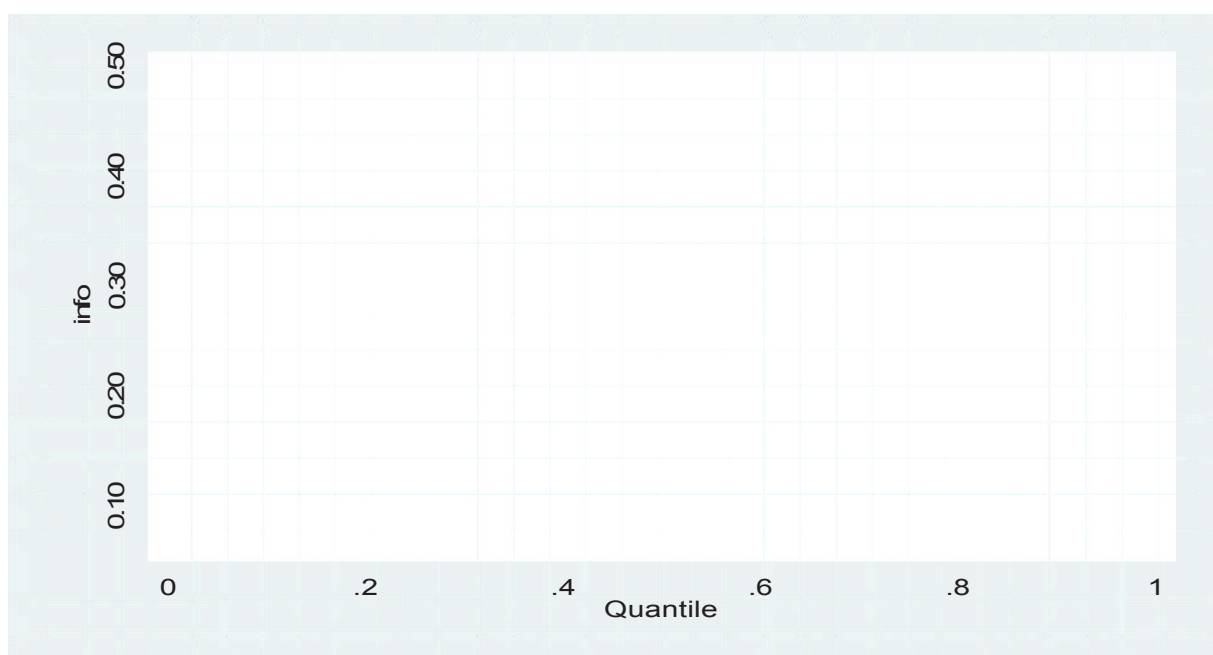
Graph 2: Information sharing and proportion of private credit/GDP

Regarding the control variables, they're all in accordance with the theoretical predictions, despite inflation and growth of per capita GDP not being significant for most cases. An important observation that must be made is that regarding the variable related to enforcement of contract.

This presented high significance for all Mercosul countries, with high economic significance, pointing that more efficiency in the legal system tends to foster expansion in the credit market.

Therefore, in summary, all Mercosul countries can expand their credit markets with bigger creditor protection and with the existence of a credit information system.

These gains tend to be bigger, in absolute terms, for the countries which have a more developed credit market, due to gains in scale. Besides that, since all Mercosul countries already have credit information systems, the gains would come from reformations which would increase creditor protection.

6. CONCLUSION

This article tried to analyze the relevance of creditor protection and the existence of a credit information system (presence of public records and of credit institutions) in the development of the credit market in the countries which make up MERCOSUL.

Using quantile regression as its empirical approach, we conclude that an increase in creditor protection and the implementation of information systems have positive impact in the credit market of all countries, regardless of the development level of this market. Besides that, Mercosul countries with higher indexes of credit market development are even more sensible to an increase in creditor protection and to the implementation of an information system. The intuition for this result is connected to gains in scale which might exist in economies with bigger credit markets, having more creditors benefitted and thus, in absolute terms, a sharper market expansion.

However, despite the information system proportioning a strong impact in the size of the credit market, we can conclude that, comparatively to creditor protection, the latter becomes less important for the Mercosul countries in general. That's because all the countries already possess credit information systems, and, therefore, it wouldn't be a policy tool which would bring gains, different from creditor protection where all Mercosul countries have room for reformation, being capable of increasing it significantly.

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[4] All regressions were also implemented using standard-errors robust to heteroskedasticity. The significance of the coefficient regarding creditor protection and information sharing changed only marginally, and did not influence the conclusions.