Scholars have alternately identified geography, international trade, and institutions as the main determinants of economic growth. The economic literature identifies the quality of institution, specifically the quality of the legal and financial system, as an essential factor in creating and enhancing economic growth. However, the link between the legal and financial system is still controversial. This paper outlines a specific group of events involving payroll debit loans in Brazil, and adds evidence of the relationship between the legal and the financial systems. The paper uses empirical evidence to study the rise of Brazilian payroll debit loans as an instance of variation in the institutional setting. First, I show that payroll debit loan regulation reduced the interest rates charged by the financial institutions and increased the amount of transactions as well as the sum of money. Second, I show that a judicial decision with no formal precedential effect nevertheless lead banks to restrict the amount of money of the payroll debit loan, thereby increasing its interest rates. These findings lead to the conclusion that the legal and the financial systems are strongly related.

I – INTRODUCTION

Over the past century, there has been an extensive debate surrounding the determinants of economic growth. Geography, international trade, and institutions have been pointed to as the main determinants of economic growth. Although an intricate net of causality ties these determinants together, the quality of institutions has been widely accepted as an essential factor in creating and enhancing economic growth.
enhancing economic growth. This paper builds upon the theory of institutions, particularly to the link between the legal and the financial systems.

The literature related to the legal and the financial systems attempts to solve three main problems: whether one of the different types of financial systems better explains economic growth; whether legal origin matters for economic growth; and whether legal origins affect the development of a financial system. This paper does not attempt to provide final answers to these problems, nor does it aim to demonstrate conclusively whether the relationship between a legal and a financial system affects economic growth. Rather, the aim of this paper is to make the modest claim of adding evidence to the growing body of literature linking the legal and the financial systems.

To demonstrate the link between the legal and the financial systems, I use a specific group of events that occurred in Brazil. These events provided variation on the path of some institutional settings, and I was able to empirically demonstrate these variations. These events are associated with the market of the payroll debit loans (“PDL”) in Brazil. PDLs are personal loans that allow workers to use their salary as collateral in order to take out the loan. Workers can make loans with principal and interest payments directly deducted from the future payroll check. In June 2004, a high-level federal court ruled that the payroll deduction were illegal.

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2 Dani Rodrik, Arvind Subramanian, and Francesco Trebbi, Institutions Rule: The Primacy of Institutions Over Geography and integration in Economic Development, 9 J. Econ. Growth 131 (2004) (The results in the work of Rodrik et al. indicates that the quality of institutions is more important to economic growth than geography and international trade.) [hereinafter Rodrik, Subramanian, Trebbi].

3 Asli Demirgüç-Kunt and Ross Levine, Financial Structure and Economic Growth a Cross-Country Comparison of Banks, Markets, and Development 81 (2001). (There are two main types of financial systems, bank-based and market-based. In bank-based financial systems, such as Germany and Japan, banks execute most of the financial functions. In market-based financial systems, such as England and the United States, securities markets are the main channel to get society’s savings to firms, to exert corporate control, and to facilitate risk management.)

4 Rafael La Porta, Florencio Lopez-de-Silanes, Andrei Shleifer, and Robert W. Vishny, Law and Finance, 106 J. Pol. Econ. 1113 (1998) (This literature developed the first and most discussed work related to whether legal origin matters for economic growth and whether it affects the development of the financial system.) [hereinafter La Porta et al.].

Using two types of personal loans as control groups, I evaluate whether the high-level federal court decision had a direct impact on the overall operation for PDLs. The data suggested that the judicial decision had an unfavorable effect on the overall operation of the PDLs. These events provide evidence of the legal and financial system link.

The remainder of this paper is structured as follows: Section II provides a short theoretical background on economic growth, institutions, and PDLs in Brazil; Section III describes and explains the data and method used to design the empirical findings; Section IV reviews and analyzes the results; and Section V gives some concluding remarks.

II – BACKGROUND

A. ECONOMIC GROWTH

In a very simplified approach, one can understand economic growth as a quantitative expansion of the productive capacity of a country in a determined period. Economic growth is normally measured to be an increase in the wealth, or more accurately in the income, of a nation. To understand or to explain economic growth, one should be able to compute economic growth with some degree of accuracy. Economic growth can be calculated using the real gross domestic product (GDP) of a country as a reference. If there is an increase in the GDP, one can conclude that there was economic growth and suggests an improvement in the well-being of the people living in that country. GDP growth rates have been unequal among countries, and the disparity in income per capita between rich and poor countries has increased.

To understand these economic differences, academics have tried to identify the forces that boost countries’ economic growth and to develop theories about them. I summarize three of the most explored economic growth theories: (1) that geography as the main determinant of economic growth; (2) that international trade at the center of the

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story of economic growth; and (3) that the quality and development of institutions is the most important cause of economic growth variation among countries.9

1. Geography

Some academics defend the notion that a country’s economic growth rate is determined by its geographic location. Geography, the argument goes, can be a great advantage to economic growth or it can be a great impediment. The geography of a country determines factors like climate, endowment of natural resources, disease burden, transportation costs, and diffusion of knowledge and technology from more advanced areas of a country.10 Researchers, like Jeffrey Sachs, explain that geographical characteristics of some countries “are not favorable enough to attract investors under current technological conditions.”11 According to this theory, a country’s geographic location will determine its rate of economic growth or, in the worst case, will exert a strong influence in its economic growth rate.12

2. International Trade

The theory of international trade emphasizes the role of trade among countries as a driving force behind productivity change. The level of integration of a country in the world economy can cause economic growth or can impede it. Several scholars have noted that international trade has been the major determinant of whether economies grow.13 If a country presents low international

9 Rodrick, Subramanian, and Trebbi, supra note 1, at 132.

10 Id.


12 See, e.g., Frank B. Cross, Law and Economic Growth, 35 Tex. L. Rev. 1737 (2002). (Some researches explain that the presence of natural resource endowments is many times a negative factor for economic growth.)

trade rates, then it is lacking commercial integration with the world. This lack of integration is considered quite harmful to a country and plays an important role in determining the rate of a country’s economic growth. Generally, countries with low international trade have experienced low levels of economic growth.

3. Institutions

Institutional theory states that what matters are the rules of the game in a society, and the way these rules conduct people to a desirable economic behavior. Under this theory, a country that has efficient institutions should be able to achieve economic growth more easily than a country with inefficient institutions. But to which type of institutions are we referring? The concept of institutions has become almost without clarity. For the purpose of this paper, the legal system and the financial system are the two institutions to be discussed. The link between the legal and financial systems was introduced by La Porta, Lopez-de-Silanes, Shleifer, and Vishny ("LLSV"), and their work is responsible for a new academic field nowadays called "law and finance."

The law and finance theory stipulates that in countries where the legal system enforces private property laws properly, supports private contractual agreements, and protects investors’ legal rights, savers are more enthusiastic about financing firms and new investments, and consequently the financial markets are more developed. LLSV inspected why some countries are able to make policies of markets that are successful in generating and sustaining a background where people want to invest, while other countries are not. In attempting to solve this dilemma, LLSV relied on countries’ legal histories. LLSV collected data from all countries with a stock market and constructed a database. Next, they categorized each country’s legal origins. Then, they performed a mathematical analysis to try to demonstrate the relationship between legal origin and other factors. For example, LLSV tried to establish the link between the legal origin, actions of corruption, and indices of shareholders rights. Although the differences between French civil law, German civil law, Scandinavian countries’

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14 Rodrick, Subramanian, and Trebbi, supra note 1, at 132.

15 Sachs 2003, supra note 10, at 38.

16 See Douglass C. North, Institutions, Institutional Change and Economic Performance; Political Economy of Institutions and Decisions (Cambridge U. Press, 1991). (This view of institutions is strictly related with the research of Douglass North. North stated that people tend to invest more and contribute for economic growth when they are able to recuperate the returns from their investments.)
law, and English common law had been studied by other legal academics, no one until LLSV had tried to establish the influence of the legal origin on the success or collapse of the financial system, or to establish a mathematical difference between the legal systems. In a nutshell, LLSV determined that civil law countries tend to be more corrupt and to defend shareholders and creditors less effectively than common law countries. Using the assumption that shareholder and creditor rights protection can boost economic growth or that corruption can reduce it, LLSV attempted to evaluate the link between these circumstances and the legal system of a particular country. According to their findings, countries that come from a French civil law tradition often do not offer a good legal environment to generate successful financial markets. On the other hand, countries with British common law tradition more frequently offer a good legal environment to financial markets. LLSV demonstrated that the legal origin could be linked to economic prosperity, and that in general the common law offers better conditions to the financial system than the civil law tradition offers.  

Further research in the field provided similar conclusions. Beck and Levine concluded that more modern legal traditions that emerged in Europe and had been spread internationally would explain the current differences in the protection of rights of investors, in the contractual environment, and therefore the differences in the development of the financial system in diverse countries. Pinheiro and Cabral and Cristini, Moya and Powell, who analyzed different provinces and states in Argentina and Brazil, concluded that differences in legal system efficiency affect the credit markets in these countries. They confirmed that provinces and states with weaker law enforcement showed a smaller number of loans with a high default rate. Studies conducted by the Brazilian Central Bank revealed that judicial insecurity increases administrative costs within financial institutions. Legal and credit risk analysis departments become costly

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17 La Porta et al., supra note 3 (There is strong evidence sustaining the research of LLSV, but the agreement is not absolute.)


operations, further reducing the guarantee of payment even in the face of existing collateral, pressuring the risk premium built into the spread.\textsuperscript{20}

The strength of the geography, international trade, and institutional theories of economic growth may never be untangled. Although there are many empirical proxies to measure each of these determinants of economic growth,\textsuperscript{21} there is also an intricate net of causality that ties these determinants. It is almost impossible to calculate a country’s integration without the influence of the performance of this country’s institutions on its ability to integrate or how this country’s geography facilitated its integration. The causality problem becomes more complicated if we include culture as determining factor that will shape a country’s institutions and integration.\textsuperscript{22} This problem was extensively discussed by Rodrik: “Problems of endogeneity and reverse causality plague any empirical researcher trying to make sense of the relationships among these causal factors.”\textsuperscript{23}

**B. PAYROLL DEBIT LOANS (“PDL”) IN BRAZIL**

As discussed above, the literature on the link between institutions and economic growth is robust. Trying to circumvent the barriers created by the legal and judicial deficiencies, the Brazilian government developed the institution of the PDL. The PDL case in Brazil serves as an illustration of the institutions theory.

\begin{flushright}
\textsuperscript{20} Fachada, Pedro, Luiz Fernando Figueiredo, and Eduardo Lundberg, Sistema Judicial E Mercado De Crédito No Brasil, in Banco Central do Brasil Notas Técnicas do Banco Central do Brasil 35, 35 (2003)(Spread is the difference between the rate offered to the borrower and the rate at which a bank borrows funds.)

\textsuperscript{21}Rodrick, Subramanian, and Trebbi, supra note 1, at 133 (“There are many reasonable measures of ‘geography,’ such as distance from the equator, percentage land mass located in the tropics, or average temperature. The intensity of an economy’s integration with the rest of the world can be measured by flows of trade or the height of the trade barriers. The quality of institutions can be measured with a range of perceptions-based indicators of property rights and the rule of law.”)

\textsuperscript{22}Tom Ginsburg, Does Law Matter for Economic Development? Evidence from East Asia, 34 Law & Soc’y Rev. 834 (2000). (“Some have asserted that theories based on the experience of Western countries may be inapplicable to societies with very different cultural traditions.”)

\textsuperscript{23}Rodrick, Subramanian, and Trebbi, supra note 1, at 132.
\end{flushright}
Due to one of the highest interest rates in the world the Brazilian government has set out to stimulate the Brazilian credit market and to reduce interest rates, especially for personal loans. To do so, the Brazilian federal government implemented diverse measures in the second half of 2003. The most significant measure was the Medida Provisoria 130 (“MP”) of September 17, 2003, which regulated PDL in Brazil.\(^{24}\) The MP 130 was transformed into Law 10.820, on December 17, 2003, and benefited all workers conducted by the Consolidação das Leis Trabalhistas (CLT).\(^{25}\) This new regulation allowed workers to use their salary as collateral to get a loan. In short, a worker suffers discounting in her salary to pay her debt to the bank. Although the debt belongs to the employee, the employer holds back part of the corresponding wage to pay the due loan and transfers the value to the bank. The principal and interest payments can be directly deducted from the workers’ future payroll check.

The government’s goal was to extend to workers credit access in a more favorable condition, especially with reduction of the interest rates charged by the financial institutions. The direct deduction of the loans from future borrowers’ payroll check reduces significantly the risk of insolvency in these loans, which is a determining factor for the reduction of the bank spread. With the reduction of the bank spread, the interest rates in PDL were consequentially reduced and the amount of transactions enhanced.

Shortly after the implementation of PDL, a worker in the state of Rio Grande do Sul sued a bank, trying to break the PDL contract he had with the bank. The worker had taken a loan in the value of R$1.105 (approximately U$502) and had authorized the deduction from his salary in the value of R$58.66 (approximately U$26.66) to cover amortization and interest expenses. The monthly nominal interest rate was 3.8%. The worker sued the bank claiming that his salary was essential for his subsistence and could not be pawned.

In June 2004, the Superior Tribunal de Justiça (STJ), which is a high-level federal court,\(^{26}\) decided the Rio Grande do Sul worker case. The STJ ruled that the payroll deduction was illegal. The court’s reason for ruling the payroll deduction to be illegal was that wages are essential for subsistence and therefore cannot be pawned. One of the judges of the STJ, in a press interview, explained

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\(^{24}\) Medida Provisória (MP) is a executive decree. It needs to be approved or reject by the legislature before the end of a determined period.

\(^{25}\) Consolidação das Leis Trabalhistas (CLT) is the code that guides all legal workers in Brazil.

\(^{26}\) STJ is in between the Supremo Tribunal Federal (STF – corresponding to the American Supreme Court) and the Tribunais Federais de Justiça (TFJ – corresponding to the American Federal Circuit Courts.)
that the deduction from salary, based on PDL contracts, can be suspended when legally evaluated from the salary viewpoint. He also declared that banks perhaps need to seek for other forms of guarantees instead of workers’ salary.\textsuperscript{27}

Although the judicial decision had no formal precedential effect, because of the civil-law context, the decision signaled to the banks that courts would examine these loans in the future and possibly not enforce them.\textsuperscript{28} Shortly after the ruling, studies showed that market and financial experts suspected that the decision of the federal court would become precedential, and consequently turn ineffective the use of future income as collateral.

\section*{III – DATA AND METHOD}

\subsection*{A. DATA}

I built a data set of PDL, Consumer Overdraft Facility Loans, Other Loans, and the Interest rate Selic (Treasury Bond). I used data from the Brazilian Central Bank, more specifically from the sector of Economy and Finance – Press Releases of the month of August of 2006.\textsuperscript{29} For all types of loans I have monthly total amount of the operation and monthly average interest rates over a period starting on January 2004 and ending on June 2005. I included in my data set two other variables besides the ones collected from the Brazilian Central Bank. First, I included the variable Time Trend that was created to take account of possible economic growth effects in my data. Second, I included a dummy variable to measure the effects of the June 2004 judicial decision that ruled PDL illegal. Although the judicial decision occurred in June of 2004, I am measuring its effects beginning in August of 2004. August was the appropriate date for two reasons. First, the court ruled at the very end of June (28\textsuperscript{th}), but the press release

\begin{center}
\begin{footnotesize}
\begin{tabular}{l}
\textsuperscript{27} See Gazeta Mercantil, July 16, 2004. \\textsuperscript{28} Each legal case decided in courts in Brazil is case specific, and does not become precedent. However, there is a “tradition” that lower courts will not deviate too far from a decision of a higher court. Such court behavior is not regulated in the Brazilian constitution or any other document. It is uncommon, but not rare, to have a lower court ruling in opposition of higher court. \textsuperscript{29} See the Official Web Page of the Central Bank of Brazil, http://www.bcb.gov.br/htms/infecon/notas.asp?idioma=p&id=ecoimphist.
\end{tabular}
\end{footnotesize}
\end{center}
announcing the decision did not occur until July.\textsuperscript{30} Second, in a civil legal system, such as in Brazil, the precedential effects of a judicial decision are not immediate, and it will take longer for the market to adjust to it.

B. METHOD

To provide empirical evidence that the June 2004 judicial decision had direct impact on the PDL overall operation, I developed the following exercise. Over a period of time that contains the June 2004 judicial decision I compared the development of three products, PDL, Overdraft Facility Loans, and Other Loans.\textsuperscript{31} I tested if the June 2004 judicial decision had an effect on the amount of the PDL, and if the June 2004 judicial decision had effect on the price (interest rate) of the PDL. If I detected a difference in the development of the amount or price over the period, all other things held constant, then I inferred that the June 2004 decision had an effect on the PDLs.

One possibility that may have changed the outcome was that some economic event could have occurred and destabilized the Brazilian financial markets during the period of my analysis. Due to these presumed events, the amount and price of the PDL could have changed their path regarding the June 2004 judicial decision. In order to solve this problem, I also tested if the June 2004 judicial decision had effect on the Overdraft Facility Loans and Other Loans, and I evaluated their paths. Because the court decision made it less likely that lenders would be able to enforce their security interest in a borrower’s wages, I hypothesize that the decision had a negative effect on the amount of PDL outstanding but a positive effect on the price (interest rate) at which the banks would offer PDLs.


\textsuperscript{31}The approach that I will use is in some ways similar to that in Costa & Mello. Moreover, others loans mean all personal loans that are not classified as Payroll Loans or Overdraft Facility Loans. Usually loans used to acquisition of inexpensive merchandise.
IV – RESULTS AND ANALYSIS

I will start by showing and analyzing the effect the June 2004 judicial decision had on the amount of the PDL, and I will do this in three steps.

Table 1: OLS Regressions on the Impact of the Judicial Decision of June of 2004 on the Total Payroll Debit Loans (Amount).

<table>
<thead>
<tr>
<th>Dependent Variables</th>
<th>(1)Total PDL</th>
<th>(2)Total Overdraft Facility Loans</th>
<th>(3)Total Other Loans</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total PDL</td>
<td>3.48**</td>
<td>4.18**</td>
<td>4.21**</td>
</tr>
<tr>
<td>Total consumer overdraft facility loans</td>
<td>4.21**</td>
<td>0.55</td>
<td>-4.18**</td>
</tr>
<tr>
<td>Total others loans</td>
<td>1.75</td>
<td>0.76</td>
<td></td>
</tr>
<tr>
<td>Time trend</td>
<td>1.75</td>
<td>0.55</td>
<td>0.76</td>
</tr>
<tr>
<td>Judicial decision of June 28 of 2004</td>
<td>-2.63*</td>
<td>1.1</td>
<td>1.67</td>
</tr>
<tr>
<td>Constant</td>
<td>-3.47**</td>
<td>9.93**</td>
<td>8.47**</td>
</tr>
<tr>
<td>Observations</td>
<td>18</td>
<td>18</td>
<td>18</td>
</tr>
<tr>
<td>Adjusted R²</td>
<td>0.98</td>
<td>0.86</td>
<td>0.98</td>
</tr>
</tbody>
</table>

*—significant at 5% level; **—significant at 1% level

Note: Table 1 presents ordinary least squares regressions with three different dependent variables. Total amount (in Millions of Reais) of PDL, Consumer Overdraft Facility Loans, and Other Loans. All the data used to construct these three variables are from the Central Bank of Brazil, more specifically from the sector of Economy and Finance – Press Releases of the month of August of 2006. For all types of loans, the dependent variable is the total amount outstanding over a period starting on January 2004 and ending on June 2005. For regression 1 the dependent variable is Total PDL, that is a type of personal loan with payroll deduction. Total Consumer Overdraft Facility Loans and Total Other Loans, both personal loans without payroll deduction, are used as control variables. For regression 2 the dependent variable is Total Consumer Overdraft Facility Loans. Total PDL and Total Others Loans are used as control variables. For regression 3 the dependent variable is Total Other Loans. Total PDL and Total Consumer Overdraft Facility Loans are used as control variables. Once the dependent variable is replaced in the regression it will take the place of an independent variable and will serve as control. For each of the three regressions a Time Trend variable was created to compensate economic growth, and a dummy variable was created to control for the effects of the Judicial Decision of June 28 of 2004.
First, I ran ordinary least-squares regression using the Total PDL as the dependent variable. The results are presented in Table 1, column (1). The adjusted $R^2$ indicates that 98% of the variation of the dependent variable is explained by the four independent variables. Statistical results indicate that the variables Judicial Decision of June 2004, Total Consumer Overdraft Facility Loans and Total Other Loans are statistically significant, while Time Trend is not. The Judicial Decision of June 2004 coefficient that is negative and statistically significant suggests that the amount of PDL decreased after the Judicial Decision.

I am aware that in the first regression that I report the (statistically significant) constant term is a negative number—namely, -3.47. I do not know how to interpret a negative constant term in this regression because I do not understand what it would mean to have a negative number of payroll deposit loans. To correct for that problem, I ought to rerun these regressions using an econometric method called “Tobit” or a “censored regression model.” That general class of model, developed by the Nobel Laureate James Tobin, deals with processes or events in which the dependent variable is constrained so that it takes on, say, positive values for some observations and zero for others. An example would be the number of hours that a sample of people worked in the past month. Some will report positive numbers, while others will report that they did not work at all. Another example might be to ask a sample of people how much they spent on new car purchases in the last year. Some may report sums between $10,000 and $80,000, while others will report 0.

In both of the examples, as in my example of payroll deposit loans, it would not make sense for the dependent variable to take negative values. So, the dependent variable has to be constrained to take on some positive values and zero (0) in all other instances:

$$Y_i = Y_i^* = \beta X_i + u_i \quad \text{if} \quad Y_i^* > 0$$

$$= 0, otherwise$$

One then defines a likelihood function and generates maximum likelihood estimates of the coefficients. Using OLS, as I did, where one should have used Tobit or censored regression can result in biased parameter. In view of the fact that I have a limited number of observations, I intend to perform these censored regressions in the near future, after I have gathered additional data. Till then, however, I am simply reporting the OLS estimates—in the understanding that the parameter estimates may be biased.

Second, I ran ordinary least-squares regression using the Total Consumer Overdraft Facility Loans as the dependent variable. The results are presented in Table 1, Column 2. The adjusted $R^2$ indicates that 86% of the variation of the dependent variable is explained by the four independent variables. Statistical results indicate that the variables Total PDL and Total Others Loans are
statistically significant, while Judicial Decision of June 2004 and Time Trend are not. The Judicial Decision of June 2004 coefficient that is not statistically significant suggests that the amount of Total Consumer Overdraft Facility was not affected for the Judicial Decision of June 2004.

Third, I ran ordinary least-squares regression using the Total Other Loans as the dependent variable. The results are presented in Table 1, Column 3. The adjusted $R^2$ indicates that 98% of the variation of the dependent variable is explained by the four independent variables. Statistical results indicate that the variables Total PDL and Total Consumer Overdraft Facility are statistically significant, while Judicial Decision of June 2004 and Time Trend are not. The Judicial Decision of June 2004 coefficient that is not statistically significant suggests that the amount of Total Other Loans was not affected for the Judicial Decision of June 2004.

Although the Judicial Decision was not statistically significant to Consumer Overdraft and to Others Loans, its positive coefficient suggested that the amount of both types of loans increased after the decision. This result would help to confirm the hypothesis that the decision led to a reduction in the amount of PDLs outstanding. Therefore, a person that did not have access to the PDL (which was a cheaper loan) had to migrate to different types of loans that were available that time. This migration could help to explain the increase in the total amount outstanding of Consumer Overdraft loans and Other Loans.

My second and third OLS regression helped to reinforce the results of my first OLS regression. Both regression results reinforced that the judicial decision of June of 2004 had effect over the Total PDL besides any economic event that could have occurred in the country in that period. If the Judicial Decision of 2004 were statically significant to Total Overdraft Facility and Total Other Loans, one could argue that something else had occurred and changed the path of all modalities of loans in Brazil. However, it was not the case. In both OLS regression the Judicial Decision of 2004 was not statistically significant to Total Overdraft Facility and Total Other Loans.
Table 2 evaluates the effect of the June 2004 judicial decision on the price of the PDL and uses a similar technique as Table 1.

Table 2: OLS Regressions on the Impact of the Judicial Decision of June of 2004 on the Price of Payroll Debit Loans (Interest rate).

<table>
<thead>
<tr>
<th>Dependent Variables</th>
<th>Interest Rate PDL</th>
<th>Int. Rate Consumer Overdraft Facility Loans</th>
<th>Int. Rate Other Loans</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interest rate PDL</td>
<td></td>
<td>0.9</td>
<td>2.72*</td>
</tr>
<tr>
<td>Interest rate consumer overdraft facility loans</td>
<td>0.9</td>
<td></td>
<td>0.35</td>
</tr>
<tr>
<td>Interest rate others loans</td>
<td>2.72*</td>
<td>0.35</td>
<td></td>
</tr>
<tr>
<td>Time trend</td>
<td>-4.12**</td>
<td>-0.14</td>
<td>1.03</td>
</tr>
<tr>
<td>Interest rate selic - treasury bond</td>
<td>1.07</td>
<td>3.94**</td>
<td>-1.07</td>
</tr>
<tr>
<td>Judicial Decision of June 28 of 2004</td>
<td>2.35*</td>
<td>-0.3</td>
<td>-0.18</td>
</tr>
<tr>
<td>Constant</td>
<td>0.64</td>
<td>6.55**</td>
<td>-1.03</td>
</tr>
<tr>
<td>Observations</td>
<td>18</td>
<td>18</td>
<td>18</td>
</tr>
</tbody>
</table>

*-significant at 5% level; **-significant at 1% level

Note: Table 2 presents ordinary least squares regressions with three different dependent variables. The monthly average (%) of Interest Rate PDL, Interest Rate Consumer Overdraft Facility, and Interest Rate Other Loans. All the data used to construct these three variables are from the Central Bank of Brazil, more specifically from the sector of Economy and Finance – Press Releases of the month of August of 2006. For all types of loans, the dependent variable is the average interest rates of the operation over a period starting on January 2004 and ending on June 2005. For regression 1 the dependent variable is Interest Rate PDL, that is a type of personal loan with payroll deduction. Interest Rate Consumer Overdraft Facility Loans and Interest Rate Other Loans, both personal loans without payroll deduction, are used as control variables. For regression 2 the dependent variable is interest rate Consumer Overdraft Facility Loans. Interest Rate PDL and interest rate Others Loans are used as control variables. For regression 3 the dependent variable is Interest Rate Other Loans. Interest Rate PDL and Interest Rate Consumer Overdraft Facility Loans are used as control variables. Once the dependent variable is replaced in the regression it will take the place of an independent variable and will serve as control. For each of the three regressions I included the variable Interest Rate Selic (Treasury Bond) as a control variable. The data for this variable is also from the Central Bank of Brazil. It was included to control for the risk free government operations. I also include the variable Time Trend variable that was created to compensate economic growth, and a dummy variable that was created to control for the effects of the Judicial Decision of June 28 of 2004.
First, I ran ordinary least-squares regression using the Interest Rate PDL as the dependent variable. The results are presented in Table 2, Column 1. The adjusted R⁻² indicates that 85% of the variation of the dependent variable is explained by the five independent variables. Statistical results indicate that the variables judicial decision of June 2004, Interest Rate Others Loans and Time Trend are statistically significant, while Interest Rate Consumer Overdraft Facility Loans, Interest Rate Selic (Treasury Bonds) are not. The Judicial Decision of June 2004 coefficient that is positive and statistically significant suggests that the price (the interest rate) of PDL increased after the Judicial Decision, which was what I expected.

Second, I ran ordinary least-squares regression using the Interest Rate Overdraft Facility Loans as the dependent variable. The results are presented in Table 2, column (2). The adjusted R⁻² indicates that 91% of the variation of the dependent variable is explained by the five independent variables. Statistical results indicate that the variable Interest Rate Selic-Treasury Bond is statistically significant, while Judicial Decision of June 2004, Time Trend, Interest Rate PDL and Interest Rate Other Loans are not. The Judicial Decision of June 2004 coefficient that is not statistically significant suggests that the price of the Consumer Overdraft Facility was not affected for the Judicial Decision of June 2004.

Third, I ran ordinary least-squares regression using the Interest Rate Other Loans as the dependent variable. The results are presented in Table 2, Column 3. The adjusted R⁻² indicates that 53% of the variation of the dependent variable is explained by the five independent variables. Statistical results indicate that the variable Interest Rate PDL is statistically significant, while Judicial Decision of June 2004, Time Trend, Interest Rate Consumer Overdraft Facility Loans and Interest Rate Selic-Treasury Bond are not. The judicial decision of June 2004 coefficient that is not statistically significant suggests that the price of Other Loans was not affected for the Judicial Decision of June 2004.

My second and third OLS regressions helped to reinforce the results of my first OLS regression. Both regression results reinforced my prediction that the Judicial Decision of June of 2004 had effects over the price of PDL besides any economic event that could have occurred in the country in that period. If the Judicial Decision of 2004 were statically significant to Interest Rate Overdraft Facility and Interest Rate Other Loans, one could argue that something else had occurred and changed the path of the price of all modalities of loans in Brazil. However, it was not the case; in both OLS regression the judicial decision of 2004 was not statistically significant to the Interest Rate Overdraft Facility nor the Interest Rate Other Loans.

Although the Judicial Decision of June 2004 was not statically significant to Interest Rate Overdraft Facility Loans and Interest Rate Other Loans its negative sign may indicate that the overall interest rate in Brazil was decreasing.
Such a situation also reinforces the negative effect of the Judicial Decision of June 2004 over Interest Rate PDL.

**V – CONCLUSION**

The results in the regression analysis suggest that the June 2004 court ruling had a negative effect on the Brazilian market performance of PDL. Data suggest that after the judicial decision of June 2004, banks restricted the amount of money available for PDL and increased its interest rates. These results are far from obvious. However, together these results provide significant empirical evidence of the link between the legal and the financial systems. The empirical results support and refine the theoretical literature in the field of law and economic growth.

The results highlighted that the rules of the game in a society are important to shape peoples’ behavior. Initially, the Brazilian government created a new rule (i.e., the PDL program). However, the strategy in making new rules to flourish depends on the effectiveness of monitoring and punishing the players of the game. The judicial decision of June 2004 showed that the Brazilian judiciary was inefficient in punishing some players. In a civil law country, we would not expect that a lower court’s decision could have important effect on market performance; however, the results demonstrate that economic actors monitor the judicial system very closely, even though court decisions in a civil law country do not have formal precedential effect. Therefore, judicial performance has a direct association with the behavior of economic actors. These findings suggest improvements in the quality of courts’ decision-making process may be one of the ways to make the link between legal and financial infrastructure work better for countries like Brazil.