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## The effects of judicial efficiency on credit market development

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**Hoang Lan Ha**

# **The Effects of Judicial Efficiency on Credit Market Development**

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## **Abstract**

Judicial enforcement of contracts can have an effect on credit market performance because it influences the risk and costs of credit transactions. This paper documents this point by empirically investigating the relation between the efficiency of judicial systems and credit market development around the world. Data from a new database, the World Bank's Doing Business Database, are applied for the research. The efficiency of the judicial system is measured by its speed and simplicity. Regression results show that, apart from traditional variables such as the level of income or inflation rate, indicators of judicial enforcement were also statistically significant in explaining credit market development. Long litigation processes and complex procedures inversely correlated to indicators of credit market development. Countries with better judicial enforcement display more developed credit markets, represented by a larger size of the banking sector and a higher proportion of credit granted to the private sector.

*Key words:* enforcement, judicial efficiency, lending, credit market

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## 1. Introduction

Sound financial markets have long been recognized as essential to economic development. Not only do they help mobilize savings to finance investment and production, but they also contribute to economic efficiency through their role in selecting and monitoring investment projects.<sup>1</sup> The relation between financial markets and economic development has been supported by a recent large number of papers which established that financial development fosters growth both at the macroeconomic level and microeconomic level.<sup>2</sup> Developing financial markets, therefore, has been an important strategy for many developing countries. The outcome of financial sector reform, however, remains limited and financial markets in many developing countries have found little room to flourish. Traditionally, poor economic policies and market failures are usually blamed for the absence of well-developed financial markets. Recent research, however, has established that a country's financial development is related to its institutional characteristics and institutional failure is another explanation to the underdevelopment of the financial markets in developing countries.

Since the influential contribution of La Porta, Lopez-de-Silanes, Schleifer, and Vishny (henceforth LLSV) in 1997 and 1998, empirical studies focus not only on investigating legal rules and their enforcement as determinants of financial market development but also on finding out factors such as legal tradition and endowments which may explain the international variation in legal systems and thus the level of financial development.<sup>3</sup> Although much progress has been made in understanding the importance of institutional factors in explaining financial development, the empirical literature still has one shortcoming: it pays less attention to the discrete effects of legal institutions, which are important to the design of a legal framework for financial market development. This paper, therefore, will try to fill in this gap by investigating the effects of the judicial system, a formal contract enforcement mechanism, on the development of credit markets.

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<sup>1</sup> See Pagano (1993).

<sup>2</sup> See King and Levine (1993) and Levine (1997).

<sup>3</sup> See, for example, LLSV (1997, 1998), Levine (1998), Levine et al. (2000) and Beck et al. (2002a, 2002b) for empirical research on law as a determinant for financial development. Beck et al. (2002a, 2002b) also study different factors that influence the efficiency of the legal system around the world. Studies concerning the relation between property rights and finance include Claessens et al. (2002) and Johnson et al. (2002).

Several empirical studies have envisaged the impact of law enforcement on financial market development.<sup>4</sup> Using a sample of 49 countries, the works of LLSV in 1997 and 1998 show that countries with poor investor protection and low quality of law enforcement have smaller and narrower equity and debt markets. However, LLSV show that the quality of law enforcement and accounting standards has less significant impact on financial development than the quality of legal contents, suggesting that effective law enforcement is not a substitute for poor legal rights. Based on the investor indices developed by LLSV, Pistor and his research fellows (Pistor et al., 2000) analyse the legal changes of shareholders and creditor rights protection in transition economies and its impact on the propensity of firms to raise external finance. They also investigate the effectiveness of legal institutions and its impact on stock and credit market development. The regression analyses also confirm that financial market development benefited from improvements in law but indicate that legality (i.e. the effectiveness of legal institutions) has overall much higher explanatory power for the level of equity and credit market development in transition economies than the quality of law on the books. Such result is different from LLSV's studies which emphasize the role of law on the books. Pistor et al. (2000) explained that the difference was a reflection of the corporate governance problem in the transition countries as they are transforming their economies from centrally-planned to market-oriented ones. Reform of laws on the book would only have marginal effects on the availability of external finance unless there were parallel improvements in the effectiveness of legal institutions to support enforcement of the reforms. This suggests a more important role that legal institutions can play in developing countries where structural reforms are taking places.

Levine (1998) specifically investigates the connection between the legal environment and banking development. The legal environment for banking development<sup>5</sup> is defined to encompass the protection of creditor rights and the presence of law enforcement. The study indicates a close relationship between the legal system and banking development. Enforcement matters in that countries with better enforcement have better-developed banks than countries where enforcement is lax.

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<sup>4</sup> See, for example, LLSV (1997, 1998), Levine (1998) and Pistor et al. 2000.

<sup>5</sup> Bank development was measured by the value of loans made by commercial banks and other deposit taking banks to the private sector (Levine, 1998).



For empirical research, the assessment of the quality of law enforcement is troublesome since such quality is hard to quantify. So far, several indicators have been used by researchers as proxies for the quality of law enforcement. LLVS (1997, 1998) used estimates of "law and order" compiled by private rating agencies<sup>6</sup> through surveys that ask respondents about their perceptions of the matter. Several issues were selected: the effectiveness of the judicial system, the respect for rule of law, the level of corruption, and the risk of government repudiation of contracts. Pistor et al. (2000) used a survey-based data compiled by the European Bank for Reconstruction and Development to measure law enforcement in transition economies, which reports the percentage of firms in the sample agreeing that the legal system will protect their property rights and enforce their contract.

One problem of using perception data is that it may not adequately reflect the actual performance of institutions. For example, when answering the question, whether the judiciary is effective, respondents may rely on their experience with other parts of the government, but not on any direct experience with the courts. In part this could be overcome by better sampling procedures and design of questions. Another problem with the current measures of the effectiveness of law enforcement is that available measures are general and indirect, thus providing little implications for developing countries on how the legal system should be reformed to support development. For instant, if we want to know what makes the litigation process in resolving credit dispute inefficient, a look at the rule of law index may not be as appropriate as at the actual litigation process in this area.

This paper therefore will try to overcome this shortcoming by applying more direct measures of the quality of legal enforcement to the study of financial development. More specifically, the paper will link indicators of the efficiency of the judicial system as regards to the enforcement of commercial contracts to indicators of credit market development.

This paper is perhaps most close to the study of Jappelli et al. (2002) who also studied the effects of the efficiency of courts on credit markets in Italy for the period of 1984 to 1995. They used two indicators of court efficiency (length of ordinary civil trials and number of civil suits pending per thousand inhabitants) and related them to measures of credit market performance (measured by outstanding loans, ratio of non-performing loans, loan concentration, etc.). This paper, however, differs from the work of Jappelli et

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<sup>6</sup> LLVS (1997, 1998) used data from the Business International Corp. and the International Country Risk.

al. in that it extends the framework of research to a cross-country study. In addition, it applies some new indicators measuring the efficiency of the judicial system in enforcing contracts and links them to indicators of credit market development.

The remainder of the paper is organized as follows: Section 2 presents the theoretical foundation highlighting the role of contract enforcement in improving information and reducing transaction costs in credit markets. Section 3 discusses the indicators and data used in analysing the effects of the judicial system on credit markets. Section 4 presents the results. Section 5 gives some policy implications and concluding remarks.

## **2. The role of judicial enforcement in credit markets**

Traditionally, neoclassical economics assumes that institutions for a market economy (including markets, contracts, firms, and systems of regulation) are in place and consequently transactions between buyers and sellers are costless and based on perfect information. A new school of economics, the new institutional economics (NIE), has shown deviations from this ideal and attempted to make institutions endogenous.<sup>7</sup> The key to this new approach is that information is incomplete, asymmetrically distributed and costly to acquire. The cost of transacting is accordingly positive, which consists of the costs of measuring the valuable attributes of what is being exchanged and the costs of protecting rights and policing and enforcing agreements.<sup>8</sup> With various devices provided for market interactions, institutions have evolved to reduce the uncertainty caused by information asymmetries and costliness of transactions. Institutions therefore can affect the performance of the economy by influencing the costs of exchange and production.

Two broad classes of institutions have been identified by the NIE: formal and informal.<sup>9</sup> Informal or private institutions are norms of conduct often enforced by business and social groups, the church, or the family, or by private entities established explicitly to enforce codes of conduct, such as credit bureaux. These informal institutions are in contrast to those provided by the state, i.e. formal institutions. Formal institutions tend to be embodied in constitutions, laws, the structure of state decision making and regulation enforced by judges, courts, police, bureaucracy and the like. Though informal institutions can be effective in resolving private disputes, whether they are sufficient to establish the

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<sup>7</sup> See, for example, Coase (1998) for a short review of the development of NIE.

<sup>8</sup> North (1990), p. 27.

<sup>9</sup> See Keefer and Shirley (2000), p. 96-98.

institutional basis for protecting property rights (and economic development in general) is questionable because of two reasons: First, informal institutions do a poor job of protecting against crime (expropriation by private actors) and expropriation by government officials. Second, informal institutions are often not available to all, or even to most, potential participants of the market.<sup>10</sup> Actually, most contractual arrangements are enforced through a mix of formal and informal institutions. However, the role of formal institutions in strengthening enforcement is of particular importance for contractual arrangements like credit contracts that require more coordination than markets can provide.

In credit markets, the problems of information asymmetries and transaction costs are prominent. Lenders generally do not have perfect information about the borrowers, for example on their creditworthiness, on the rate of return on investment projects, and the future need for liquidity. The costs of granting credits are positive and incurred not only in identifying potential borrowers, gathering and processing information, but also in arranging a credit contract, monitoring and enforcing it.<sup>11</sup> Theoretically, by arranging a credit contract, the lender and the borrower can set up a mechanism for self-enforcement.<sup>12</sup> Due to information asymmetries, however, three problems arise in tailoring a credit contract: (i) the contracting parties do not know the probable occurrences of all future events; (ii) the principal (the lender) does not know the utility function of the agent (the borrower); and (iii) the execution of the contract is subject to costs and uncertainty. Credit contract is therefore seen as incomplete whereby the contracting parties can not specify all terms *ex ante* but need a kind of third-party enforcement rather than self-enforcement.<sup>13</sup> Generally, lenders will not provide financing in the absence of a third party to effectively enforce contract because otherwise borrowers

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<sup>10</sup> See Keefer and Shirley (2000).

<sup>11</sup> It is also information asymmetries and transactions costs that give rise to the existence of financial intermediaries, since they have certain technologies (i.e. screening and monitoring) to mitigate these problems. Nevertheless, this does not mean that financial intermediaries possess perfect information. For example, banks may incur losses when they cannot distinguish good credit from high risk (less creditworthy) borrowers (adverse selection) or when an opportunistic borrower sets out to obtain a loan but with no intention to repay back (moral hazard) (see, for example, Stiglitz et al. (1981) and Diamond (1984)). The ability of financial intermediaries to reduce adverse selection and moral hazard therefore defines their efficiency.

<sup>12</sup> Self-enforcement here is understood as a set of clauses based on mutual consent among partners with no arbitrariness in their implementation, and, therefore, no need for intervention of a third party.

<sup>13</sup> For more on contracts and enforcement mechanisms, see Ménard (2000).

can act opportunistically and refuse to pay. This brings directly into the picture the importance of formal institutions that govern the enforcement of contracts and protection of property rights.

In reality, the legal system is an important institutional arrangement since it provides a third-party enforcement mechanism for securing contracts and property rights. The legal system consists of *laws on the book* which define rights and obligations of contract parties and *laws in action*, which is the enforcement of these rights and obligations in practice. With regard to credit markets, the legal system can influence credit markets' activities through both channels: it defines the rights of the lender over his property in the contents of the law, and provides mechanisms, for example the judicial system, to enforce them.<sup>14</sup> In a credit market with asymmetric information, when entering a credit transaction, the bank often gets the right to repossess collateral or to force a reorganization of the firm, when some conditions, such as the payment of interests or the adherence to particular covenants, are violated. Though such rights of the lender are specified in relevant legal codes (such as contract law, collateral law or bankruptcy law), the protection of lender's rights also depends on how laws are implemented in practice.

In many countries, the enforcement of laws and regulations are enforced in part by public institutions as courts. In credit relationships, the key function of courts is to force solvent borrowers to repay when they fail to do so spontaneously. Generally they constitute a measure of last resort for the lender as courts are only needed when payment is default. Judicial enforcement procedures therefore only play a minor role on day-to-day credit transaction. Nevertheless, the importance of courts and related institutions such as judicial administration and police (i.e. the judicial system) is prominent in credit market as they partly form the incentives on credit markets by influencing borrower's *ex post* willingness to pay and lender's *ex ante* willingness to extend credit.

Poor legal enforcement by the judicial system may increase the opportunistic behaviour on the part of the borrower: anticipating that the creditors will be unable to recover their loans easily and cheaply via the courts, borrowers may tempt to default. Inefficient judicial system therefore may increase the risk of lending and *ex post* costs. Lenders may respond by reducing the availability of credit, increasing interest rates, or shifting their bulk of lending to the state sector where payment is guaranteed by the state. When the

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<sup>14</sup> See Fabbri (2001).

judicial system is efficient and predictable, however, it brings confidence to credit market participants by enhancing the predictability of exchange and reducing market uncertainty. This, in turn, facilitates parties to enter into credit transactions as it is easier for them to realize gains from their transactions. Hypothetically, then, credit markets should be more widespread and developed in countries with efficient judicial systems that enforce contracts effectively.

### **3. Measuring credit market development and judicial efficiency**

#### **3.1. Credit market development**

The development of the credit market can be measured in terms of its *size*, *structure* and *efficiency*. Respectively, three indicators will be used: the total assets of deposit money banks divided by GDP (BANKASSET), the total value of loans granted by deposit money banks to the private sector divided by GDP (PRIVATE), and the spread between interest rates for loans and interest rates for deposits (SPREAD). These indicators have been widely regarded as good proxies of financial market development in general. They were used in a large number of studies on finance and economic development, which showed that these indicators were related strongly to the level of per capita income, productivity and investment.<sup>15</sup> A larger size of the credit market and more credit granted by banks to the private sector indicate a higher level of development.<sup>16</sup> Meanwhile, a wider spread between lending and depositing interest rate indicates lower efficiency in channelling savings to investments, thus a lower level of credit market development.

The data for BANKASSET and PRIVATE are extracted from the Financial Structure Database (Beck et al., 2001). Data for SPREAD are from the International Monetary Fund's International Financial Statistics. All the data refer to the year end 1997.

#### **3.2. Efficiency of the judicial system**

To measure the efficiency of the judicial system in enforcing contracts, the research relies on three indicators and data maintained by the World Bank's Doing Business database.<sup>17</sup> The data are derived from questionnaires on contract enforcement answered by attorneys

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<sup>15</sup> See, for example, King and Levine (1993), Levine (1997, 1998), Demirguc-Kunt et al. (2001).

<sup>16</sup> Levine (1997) provides a theoretical foundation for these indicators.

<sup>17</sup> The database is available on line at: <http://rru.worldbank.org/DoingBusiness>.

and private law firms in 109 countries in January 2002.<sup>18</sup> The questionnaires gave detailed assumptions about a debt recovery case before local courts, which enabled the respondent law firms to describe the procedures explicitly and in full details. To the extent that we are interested in the ability of banks to use the judicial system to recover their loans, this data is highly relevant.

The first indicator is an estimate of the *duration of the process of dispute resolution* (DUR) by lawyers who completed the questionnaires. It measures the number of calendar days counted from the moment the plaintiff files the lawsuit in court, until the moment of actual payment. The length of the litigation process directly relates to the costs of enforcing credit contract incurred by the lender: a long trial increases the legal expenses and more importantly, during the trial, the lender is exposed to the risk of unexpected changes in the value of collateral. Therefore, a long duration of judicial process may indicate inefficiency of the judicial system and would have negative impacts on the development of the credit market (i.e. it is expected to negatively relate to PRIVATE and BANKASSET, and positively relate to SPREAD).

The second indicator of judicial efficiency is the *number of independent procedural actions* (PROC), where each action is defined as a step of the procedure, mandated by law or court regulation, which demands interaction between the parties or between them and the judges of the court officer. A large number of procedural actions can imply that the judicial system is weak and inefficient in that it needs many actions to prove the rights of creditor. PROC therefore is also estimated to have negative impact on credit market development.

The third indicator is an index of the *degree of formalism* (FORMA) in the procedures to resolve disputes (hence after the formalism index). The index, together with the first two indicators, was first developed by Djankov et al. (2002). It measures substantive and procedural statutory intervention in judicial cases, and is formed by adding seven different sub-indices, which included PROC.<sup>19</sup> Formalism is defined as the extent to which the

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<sup>18</sup> There is actually a time gap between the two sets of data: credit market data are for 1997 and judicial efficiency data are for early 2002. Nevertheless, since changes in legal systems are usually slow, the data for 2002 can still reflect well the level of judicial efficiency for the year 1997. The time gap is therefore not expected to cause major problem to the analysis.

<sup>19</sup> Please refer to Table 1 for more detailed description of the indicator. For the detailed description of the methodology for the formalism index, please see Djankov et al. (2002).

regulation causes dispute resolution to deviate from the theoretical model of an ideal court.<sup>20</sup> The index therefore measures how complex judicial litigation of simple commercial disputes is, and therefore how difficult it is for a lay person to pursue legal procedures by him/herself in defence of his/her interests. Higher formalism therefore is expected to negatively influence credit market development.<sup>21</sup>

To cross-check for validity of the data, the above indicators were related to two widely-used indicators of contract enforcement. The first is the "law and order" index from the International Country Risk guide, which measures the law and order tradition in a country. Higher value indicates stronger law and order tradition. The second indicator is "contract enforceability", developed by Knack and Keefer (1995), using data from the Business Environment Risk Intelligence. This indicator measures the relative degree to which contractual agreements are honoured and higher value indicates higher enforcement quality. Both of the indicators were extracted from the Financial Structure Database (Beck et al., 2001). Table 3 shows the correlations between our three indicators of judicial efficiency and the two indicators: "law and order" and "contract enforceability". The results show a rather high correlation but not perfect. The three indicators negatively correlate to "law and order" and "contract enforceability", and most indicators have more than 0.40 correlation (except for the correlation between "duration" and "law and order", which is only 0.22). This is taken as evidence that the three indicators based on the Doing Business Database track the quality of contract enforcement reasonably well. As mentioned above, this study does not use "law and order" and "contract enforceability" in its regression analysis because it focused on the role of the judicial enforcement of contracts and wants to use more direct measures of judicial efficiency.

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<sup>20</sup> In a theoretical model of ideal court, a dispute between two neighbours can be resolved by a third on fairness grounds, with little knowledge or use of law, no lawyers, no written submissions, no procedural constraints on how evidence, witnesses, and arguments are presented, and no appeal. In reality, most jurisdictions in the world heavily formalize procedures and employ professional lawyers and judges to resolve disputes. The reasons for regulating dispute resolution are similar to those for regulation in general: the sovereign may wish to control the outcome; and/or informal resolution may be unfair as it is vulnerable to subversion by the powerful. See Djankov et al. (2002).

<sup>21</sup> Djankov et al. (2002), in their regressions on the efficiency of courts, found in a sample of 109 countries that higher formalism is associated with less fairness and impartiality, less honesty, less consistency, and less confidence in the legal system.

### 3.3. Control variables

Certainly judicial efficiency is not the only factor that may determine the development of credit markets. Country's macroeconomic condition and market-specific characteristics are likely to affect the development of its credit market. Several indicators are therefore simultaneously used to control for the characteristics of the countries under study. Macroeconomic condition is represented by two indicators. The first is real GDP per capita (GDPPC), which measures for the general development level of the country.<sup>22</sup> Better-developed countries tend to have better-developed credit markets. The second indicator is inflation rate (INFLATION). Inflation can influence the level of credit market development as they reflect the degree of macroeconomic stability: if banks feel uncertain about market conditions reflected by high inflation rate, they would reduce their lending and/or increase interest rates to compensate for the high tax imposed by high inflation. These two indicators have long been used and ascertained as factors influencing financial market development.<sup>23</sup>

To control also for some specific characteristics of credit markets, two more indicators are used. The first is the banking freedom index<sup>24</sup> (FREEDOM), which is used as a proxy for the level of state regulation and intervention in the credit markets. Several studies have established the relationship between banking regulation and banking sector development both on theoretical and empirical ground.<sup>25</sup> Barth et al. (2001) suggested that tight regulation of banks did not positively relate to bank performance and stability. As pointed out by research on law and finance, the level that laws on the book can protect creditors correlated to the level of financial development. Therefore, a measure of the protection of creditor rights, the creditor rights index<sup>26</sup> (CREDITOR), will also be used to control for the impact of laws on the books on credit markets.

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<sup>22</sup> In the regressions, the logarithm of GDPPC is used in order to reduce the absolute size of the numbers in the data.

<sup>23</sup> See for example, Beck et al. (2001), Levine (1998), and Levine et al. (2000).

<sup>24</sup> The index was developed by the Heritage Foundation and used by Demirgüç-Kunt et al. (2003) in their study on the impact of banking regulation on bank margins.

<sup>25</sup> See for example, Kane (1997) and Llewellyn (1999) for a review of theoretical foundation of banking regulation and Barth et al. (2001) for empirical study.

<sup>26</sup> The index was developed by LLSV (1998) which included data for 49 countries. It was extended by the World Bank to include data for a total of 109 countries in their Doing Business Database.



Detailed descriptions of all indicators used and data sources in this study are provided in Table 1. Table 2 represents the countries included in the analysis grouped by developed and developing countries and the corresponding data of their judicial enforcement efficiency.

#### **4. Empirical evidence on the effects of judicial efficiency on credit market development**

As discussed in Section 2, by influencing the risk and costs of credit transactions, the efficiency of the judicial system in enforcing contracts may have an effect on the development of credit markets. This section uses the indicators and data as described in Section 3 and simple econometric techniques to empirically investigate this linkage. The basic empirical model may be written as:

$$CMD = \alpha + \beta*(Conditioning\ set) + \gamma*(Judicial\ efficiency) + \varepsilon$$

where *CMD* is credit market development, equals either BANKASSET, PRIVATE, or SPREAD. *Conditioning set* is a vector of variables that controls for macroeconomic condition (GDPPC and INFLATION) and characteristics of the financial market (CREDITOR and FREEDOM). *Judicial efficiency* is represented either by DUR, PROC, or FORMA.  $\varepsilon$  is an error term.

The estimation technique used is ordinary least square regression. Due to their importance, the estimation controls for GDPPC and INFLATION in all regressions. Meanwhile, CREDITOR or FREEDOM only enters some regressions in order to test for the robustness of the indicators of judicial efficiency. To correct for heteroskedasticity, all regressions were run with White heteroskedasticity-consistent technique.

Tables 5 to 7 report the results of the estimation. It should be noted first that, as expected, indicators of macroeconomic conditions, GDPPC and INFLATION, are statistically significant in all regressions and strongly explain variation in the development of credit markets in the data. This further confirms the fact the general level of economic development and price stability are of major factors influencing credit market growth. In the following sub-sections, the power of judicial efficiency indicators in explaining each indicator of credit market development will be analysed.

#### 4.1. Judicial efficiency and the size of credit markets

Table 5 represents the results of regressions with BANKASSET as dependent variable measuring the size of credit markets. The results in general support the hypothesis that the inefficiency of the judicial system (as represented by long duration of litigation processes, more procedural actions and high level of formalism) negatively correlates to the size of the credit market. The coefficients of all three indicators of judicial efficiency are statistically significant in regressions 5.1, 5.2, and 5.3 where GDP per capita and inflation rate are controlled for. Their significances, however, varied when CREDITOR or FREEDOM entered the regressions. For example, DUR became more significant in regression 5.4 and PROC became insignificantly different from zero in regression 5.5. And though remaining negatively correlated to bank size, the influence of DUR, PROC, and FORMA was reduced and became insignificant when the level of banking freedom was controlled for in regressions 5.7, 5.8 and 5.9.

CREDITOR correlated positively and robustly to the size of credit markets, confirming the role of laws on the book in facilitating bank lending. The coefficients of FREEDOM are also statistically significant in regression 5.7 and 5.8, indicating that the size of the banking sector can be larger in countries where banks have more freedom in doing business.

#### 4.2. Judicial efficiency and the structure of the credit markets

The results of the regressions which used the proportion of credit granted to the private sector (PRIVATE) as dependant variable are represented in Table 6. In general, the results are similar to those of Table 5. All indicators of judicial efficiency entered the regressions with expected signs. The coefficients of PROC, however, are not significantly different from zero all the regressions of Table 6 that it entered. Meanwhile, the coefficient of DUR remained statistically significant in all three regressions: 6.1, 6.4, and 6.7. The explanatory power of FORMA became insignificant only in regression 6.9. These results suggest that the inefficiency of the judicial system in enforcing contracts can be a factor that influences the banks' willingness to lend to the private sector. This somehow reflects the fact in many developing countries that when banks have less confidence in the judicial system in protecting private property rights, they may shift their lending to the state sector, whereby repayment is more or less guaranteed by the government.

Again, CREDITOR entered the regressions with statistically significant coefficients. FREEDOM could also strongly explain the variation in the level of private sector credit among countries included in the data. This, however, is not a surprising result because in countries where the government can intervene in banks' decision of credit allocation and/or where the state-owned banks are dominant, the state sector often receives more credit than the private sector.

#### 4.3. Judicial efficiency and credit market efficiency

Table 7 represents the impacts of judicial efficiency and other variables on the gap between the lending interest rate and deposit interest rate (SPREAD). A positive link between judicial inefficiency and interest rate spread is anticipated on the ground that when judicial contract enforcement is weak, credit transactions are seen to be more risky and banks would increase their spread to cover the risk they have to bear. The data, however, did not support this hypothesis: all indicators of judicial efficiency, though entering some regressions with expected signs, were not statistically significant in explaining the variation in interest rate spread among countries. In the data, SPREAD was more determined by macroeconomic factors such as inflation rate and the level of income. The coefficients of creditor rights and banking freedom did not statistically differ from zero either. Furthermore, the nine regressions in Table 7 had relatively lower *R-squared* and *Durbin-Watson* statistics than those in Table 5 and 6, suggesting that the estimation model may suffer from specification errors and that the inclusion of judicial efficiency indicators in the regression might be not relevant.

The fact that the efficiency of the judicial contract enforcement did not correlate to the efficiency of the credit markets as shown by the data can be explained by two reasons. First, as suggested by the theory of credit rationing<sup>27</sup>, banks are risk averse and thus would ration credit when lending is seen to be risky. Therefore, though weak judicial contract enforcement can increase the risk of lending, banks may not react by increasing their lending interest rate but cutting down the availability of credit. Second, the spread between lending and deposit interest rate is in fact determined by many other factors rather than the nature of the risk on the markets. One of them can be government's monetary policies, whereby interest rate is often used as one of the policy instrument. Besides, the nature of competition in the banking sector, the productivity of banks, the

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<sup>27</sup> See Jaffee et al. (1976) and Stiglitz et al. (1981).

demand and supply of funds, taxes, etc. are among factors that also have impacts on interest rates. An analysis of other determinants of the interest rate spread on credit markets, however, is beyond the scope of this paper.

#### 4.4. Summary of estimation results

Among the indicators of judicial efficiency, the duration of the litigation process has the strongest significance in explaining variation in the size and structure of credit markets. The impact of DUR on the proportion of credit granted to the private sector is statistically significant in all regressions. Its correlation to the size of the banking sector's assets became insignificant only when banking freedom is controlled for. The results highlight the costs of a long litigation process as underlined by the theoretical framework of Section 2. In addition, with no possible problem of specification or heteroskedasticity reported, regressions with DUR were relatively more certain than some others. The speed of trials, therefore, can be a good indicator for the efficiency of the judicial system and an appropriate determinant of credit market development.

FORMA are statistically significant in explaining the size and structure of credit markets in regressions without FREEDOM. In general, the results are in line with those of Djankov et al. (2002) that formalism in contract enforcement seems to be not a part of an efficient legal framework, especially for financial markets. Nevertheless, the estimation results of FORMA's influence on the level of credit granted to the private sector can be ambiguous since possible specification problem was reported by the RESET test for regressions 6.3 and 6.6. Further research, therefore, is necessary before a clearer conclusion can be made on the effect of formalism on the structure of credit markets. Finally, the number of procedures required for a litigation process, PROC, though included in the formalism index, was alone not as strong as FORMA in explaining differences in credit market development.

This regression analysis should not be interpreted without caution. One caveat to the interpretation is that the estimation is static, thus failing to explore the dynamic impacts that the judicial system may have on the credit markets. With regressions based on panel data, the results can be more informative and the quality of the estimated coefficients can be improved. Panel data would also control for non-normality problem that may be distorting current estimates. Unfortunately, this can not be done due to the lack of time series data on judicial efficiency.

To summarize, according to the estimates, the efficiency of the judicial system in enforcing contracts significantly correlates to the level of credit market development. Though different indicators of contract enforcement efficiency were used, the overall research results are consistent with the findings of LLSV (1997, 1998), Pistor et al. (2000), Beck et al. (2002b), and Jappelli et al. (2002), which also confirm the role of laws in financial market development. With a larger sample of countries than those of LLSV (1998) and Pistor et al. (2000), this study further highlights the importance of law enforcement and indicates that the efficiency of judicial enforcement correlates to the level of credit market development. The results remained strong when the quality of creditor protection provided by the laws (i.e. the quality of laws on the books) is controlled for. The impacts of the judicial efficiency indicators, however, reduced when banking freedom was controlled for, indicating that the level of freedom that banks have in doing their business is a factor that can strongly explain differences in the development of credit markets over the world. This also implies a high cost that intervention in the banking sector can impose on the development of the credit markets.

## **5. Conclusions**

This paper discusses the importance of legal enforcement of contracts in credit markets by investigating the relation between the efficiency of the judicial system and credit market development. It argues in Section 2 that judicial enforcement of contracts, by influencing the risk and costs of lending, can have an effect on the development of credit markets. Empirical results confirm that, together with indicators of general economic condition and credit market characteristics, indicators of judicial efficiency are also significant in explaining the development of credit markets around the world. Countries with better judicial enforcement display more developed credit markets, represented by a larger size of the banking sector and a higher proportion of credit granted to the private sector.

By examining the role of the judicial system in credit markets, the research goes further in finding determinants of an efficient legal structure for financial market development. It suggests that a long litigation process is damaging to credit market development because it can impose high cost on credit transactions. More procedural actions required in the litigation process, which reflects the judicial system's inefficiency, can deter the expansion of the credit market. Finally, formalism in judicial enforcement might not be a part of the efficient design of the institutional infrastructure for credit market development. In fact,

the level of formalism is also high in some rich economies as shown in Table 2. Nevertheless, as pointed out by the World Bank (2001) and Djankov et al. (2002), these countries still can have more efficient systems due to the presence of complementary institutions (e.g. rules affecting judges' incentives and promoting transparency), capacity and high level of human capital to counteract the negative impacts of complexity in litigation. These factors are often missing in developing countries. In addition, as noted above, further research is necessary in order to have a clearer conclusion about formalism and its relations with private enterprises' access to credit.

The study provides several policy implications for developing countries. First, it confirms that a well-functioning institutional infrastructure is necessary for economic development. More specifically, it shows that an efficient judicial system is important to the development of financial markets. Second, by using more direct measures of judicial efficiency, the paper could provide more solid insights for the reform of the judicial system in developing countries. The regression results imply that the speed of the litigation process for contract dispute resolution should be fast enough in order to reduce the costs of enforcement and thus the costs of lending. Simplification of legal procedures can lead to more efficient outcomes as it can increase transparency and accountability of the litigation process. Judicial reform therefore should take into account measures to simplify legal procedures (e.g. small-claims courts, more oral hearing, etc.) and measures to enhance the incentive structure for judges. Last but not least, as suggested by the estimation results, the problem of judicial efficiency should not be seen as the only factor affecting the development of credit markets. The level of development and price stability remain major factors influencing credit market development. In addition, weak protection of creditor rights by the laws and harsh intervention on the banking sector are among other factors that impose high costs on credit market development.

Finally, the findings of this paper should be seen as a first attempt to empirically identify the role of the judicial system in the development of credit markets around the world. As mentioned in the previous section, the quality of the findings can be improved and further insights can be obtained when time-series data on judicial enforcement of contracts are available.

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## TABLES

Table 1: Descriptions of indicators and data sources

Indicator	Description and Source
<i>Efficiency of the judicial system in enforcing contracts</i>	
Number of procedures (PROC)	<p>Indicates the number of independent procedural actions, where each action is defined as a step of the procedure, mandated by law or court regulation, which demands interaction between the parties or between them and the judge or court officer.</p> <p>Source: World Bank's Doing Business Database (2003)</p>
Duration of dispute resolution process (DUR)	<p>Indicates an estimation of the number of calendar days counted from the moment the plaintiff files the lawsuit in court, until the moment of actual payment. This measure includes both the days where actions take place and waiting periods between actions.</p> <p>Source: World Bank's Doing Business Database (2003)</p>
Formalism index (FORMA)	<p>An index of the degree of formalism in the procedures to resolve disputes, and is formed of seven sub-indices:</p> <ol style="list-style-type: none"> <li>(1) <i>Profession vs. laymen</i>: measures whether the resolution of the case provided would rely mostly in the intervention of professional judges and attorneys, as apposed to the intervention of other types of adjudicators and lay people;</li> <li>(2) <i>Written or oral</i>: measures the written or oral nature of the actions involved in the procedure, from the filing of the complaint, until the actual enforcement;</li> <li>(3) <i>Legal justification</i>: measures the level of legal justification required in the process of dispute resolution;</li> <li>(4) <i>Statutory regulation of evidence</i>: measures the level of statutory control or intervention of the administration, admissibility, evaluation and recording of evidence;</li> <li>(5) <i>Control of superior review</i>: measures the level of control or intervention of the appellate court's review of the first instance judgement;</li> <li>(6) <i>Other statutory interventions</i>: measures the formalities required to engage someone into the procedure or to hold him/her accountable for the judgement;</li> <li>(7) <i>Independent procedural actions</i>: measures the number of independent procedural actions involved in pursuing a claim through the court, covering the filing and service of a complain, trial and judgment, and enforcement.</li> </ol> <p>For each sub index, higher values indicate more formalism in the contract enforcement process. The index range from 0 to 7, where 7 means a higher level of control or intervention in the judicial process.</p> <p>Source: World Bank's Doing Business Database (2003)</p>

### *Credit market development*

Private credit (PRIVATE) Claims on private sector by deposit money banks as share of GDP for the year 1997 (data for 1996 is used when data for 1997 is not available).

Source: Financial Structure Database (Beck et al., 2001).

Bank asset (BANKASSET) Claims of deposit money banks on non-financial domestic sectors as share of GDP for the year 1997 (data for 1996 is used when data for 1997 is not available).

Source: Financial Structure Database (Beck et al., 2001).

Spread (SPREAD) The difference between lending interest rate and deposit interest rate for the country for the year 1997.

Source: International Financial Statistics (IMF).

### *Control variables*

Real GDP per capita (GDPPC) Indicates the country's general level of development in 1997 (in USD constant at 1995's value)

Source: World Development Indicators (World Bank, 2002).

Inflation (INFLATION) Inflation rate, calculated as log difference of CPI.

Source: Financial Structure Database (Beck et al., 2001) and Transition report update 2001 (EBRD, 2001) for data on transition economies.

Creditor rights (CREDITOR) An index aggregating different creditor rights. The index is formed by adding 1 if: (1) the country imposes restrictions, such as creditors' consent, to file for reorganization; (2) secured creditors are able to gain possession of their security once the reorganization petition has been approved (no automatic stay); (3) secured creditors are ranked first in the distribution of the proceeds that result from the disposition of assets of a bankrupt firm; and (4) the debtor does not retain the administration of its property pending the resolution of the reorganization. The index ranges from 0 to 4.

Source: World Bank's Doing Business Database (2003)

Banking freedom (FREEDOM) An index indicates the relative openness of the banking and financial system, averaged over the period 1995-99: specifically whether the foreign banks and financial services firms are able to operate freely, how difficult it is to open domestic banks and other financial services firms, how heavily regulated the financial system is, the presence of state-owned banks, whether the government influences allocation of credit, and whether banks are free to provide customers with insurance and invest in securities (and vice-versa). The index ranges in value from 1 (very low) to 5 (very high).

Source: Demirgüç-Kunt et al. (2003) (originally from the Heritage Foundation's Index of Economic Freedom); available at [www.worldbank.org/research/interest/confs/042003/data.htm](http://www.worldbank.org/research/interest/confs/042003/data.htm)

**Table 2: Judicial enforcement efficiency by individual countries**

<b>Country</b>	<b>Number of Procedures</b>	<b>Duration (days)</b>	<b>Formalism Index</b>
Australia	11	319	1.8
Austria	20	434	3.51
Belgium	16	120	2.72
Canada	17	421	2.09
Denmark	14	83	2.55
Finland	19	240	3.14
France	10	181	3.23
Germany	14	154	3.51
Greece	15	315	3.98
Ireland	19	131	2.62
Italy	16	645	4.04
Japan	16	60	2.97
Netherlands	21	39	3.06
New Zealand	12	60	1.57
Norway	12	87	2.95
Portugal	22	420	3.92
Spain	20	147	5.24
Sweden	21	190	2.98
Switzerland	14	223	3.13
United Kingdom	12	101	2.58
United States	12	54	2.61
<i>Mean OECD countries</i>	<i>15.86</i>	<i>210.67</i>	<i>3.06</i>
Argentina	32	300	5.39
Bangladesh	15	270	3.23
Bolivia	44	464	5.96
Botswana	20	77	4.07
Brazil	16	180	3.06
Bulgaria	26	410	4.57
Chile	21	200	4.56
Colombia	37	527	4.11
Costa Rica	21	370	5.48
Cote d'Ivoire	18	150	3.65
Croatia	20	330	3.61
Czech Republic	16	270	4.06
Dominican Republic	19	215	4.05
Ecuador	33	333	4.92
Egypt, Arab Rep.	17	202	3.79
Ghana	21	90	2.64
Guatemala	19	220	5.68
Honduras	32	225	4.89
Hong Kong, China	13	61	0.73
Hungary	17	365	3.42
India	22	106	3.34
Indonesia	29	225	3.9

Israel	19	315	3.3
Jamaica	11	202	2.34
Jordan	32	147	3.52
Kenya	25	255	3.09
Korea, Rep.	23	75	3.36
Latvia	19	189	3.93
Malawi	12	108	2.95
Malaysia	22	90	2.34
Mexico	47	283	4.71
Morocco	17	192	4.71
Nigeria	25	241	3.09
Pakistan	30	365	3.76
Panama	44	197	5.84
Peru	35	381	5.6
Philippines	28	164	5
Poland	18	1,000	4.15
Romania	28	225	4.42
Russian Federation	16	160	3.39
Singapore	20	46	2.49
Slovenia	22	1,003	4.26
South Africa	11	84	1.68
Sri Lanka	17	440	3.78
Thailand	19	210	3.14
Tunisia	14	7	4.05
Turkey	18	105	2.52
Ukraine	20	224	3.66
Uruguay	38	360	4.05
Venezuela	41	360	6.01
Zambia	16	188	2.13
Zimbabwe	13	197	3.1
<i>Mean non-OECD countries</i>	<i>23.23</i>	<i>257.75</i>	<i>3.84</i>
<b>Mean all countries</b>	<b>21.46</b>	<b>249.04</b>	<b>3.64</b>

Source: World Bank's Doing Business Database (<http://rru.worldbank.org/DoingBusiness>).

**Table 3: Correlations of judicial efficiency data and contract enforcement data**

	<b>Duration (DUR)</b>	<b>Procedures (PROC)</b>	<b>Formalism (FORMA)</b>
<b>Law and order*</b>	-0.222	-0.419	-0.409
<b>Contract enforceability*</b>	-0.404	-0.644	-0.603

\* Source: Financial Structure Database (Beck et al., 2001).

**Table 4: Correlation matrix of independent variables**

	<b>GDPPC</b>	<b>INFLATION</b>	<b>DUR</b>	<b>PROC</b>	<b>FORMA</b>	<b>FREEDOM</b>	<b>CREDITOR</b>
<b>GDPPC</b>	1.000						
<b>INFLATION</b>	-0.281	1.000					
<b>DUR</b>	-0.175	0.252	1.000				
<b>PROC</b>	-0.395	0.120	0.169	1.000			
<b>FORMA</b>	-0.359	0.172	0.351	0.703	1.000		
<b>FREEDOM</b>	0.346	-0.130	-0.061	-0.149	-0.189	1.000	
<b>CREDITOR</b>	0.034	-0.187	0.031	-0.115	-0.163	0.427	1.000

**Table 5: Judicial efficiency in enforcing contracts and the size of credit markets**

Independent variable is BANKASSET. Estimation method is cross-sectional Ordinary Least Square with White heteroskedasticity-consistent standard errors and covariance. T-statistics are in parentheses: \*, \*\*, and \*\*\* refer to significance values of 10%, 5% and 1% respectively.

Regression Number	5.1	5.2	5.3	5.4	5.5	5.6	5.7	5.8	5.9
Constant	-0.74516 (-4.17)	-0.61769 (-3.22)	-0.45605 (-2.14)	-0.84099 (-4.54)	-0.75227 (-3.65)	-0.62406 (-2.79)	-0.84274 (-3.89)	-0.76213 (-3.29)	-0.74241 (-2.48)
Log(GDPPC)	0.17161 (7.10)***	0.16255 (6.98)***	0.15875 (6.81)***	0.16863 (7.02)***	0.161174 (6.97)***	0.15955 (6.84)***	0.14554 (6.15)***	0.13969 (5.91)***	0.14154 (5.28)***
Inflation	-0.00088 (-2.16)**	-0.00096 (-2.19)**	-0.00092 (-2.20)**	-0.00082 (-2.30)**	-0.00092 (-2.26)**	-0.00090 (-2.26)**	-0.00186 (-5.65)***	-0.00195 (-5.79)***	-0.00192 (-3.15)***
Creditor				0.06862 (2.40)**	0.06251 (2.08)**	0.05488 (1.85)*			
Freedom							0.08553 (2.09)**	0.08625 (2.09)**	0.08335 (1.52)
Dur	-0.00036 (-2.61)**			-0.00039 (-3.20)***			-0.00017 (-1.17)		
Proc		-0.00643 (-1.69)*			-0.00532 (-1.52)			-0.00341 (-0.91)	
Forma			-0.07397 (-2.24)**			-0.05778 (-1.88)*			-0.02705 (-0.45)
R-squared (adjusted)	0.49	0.48	0.50	0.53	0.51	0.52	0.51	0.51	0.51
Observations	73	73	73	72	72	72	61	61	61
Durbin-Watson statistic	2.11	2.14	2.15	2.10	2.12	2.11	2.21	2.25	2.25

Tests for regressions number 5.1 to 5.9: (at 5 percent level of significance)

- Using the White test, non-heteroskedasticity hypothesis could not be rejected in all regressions except in regression 5.3.
- RESET F-statistics (with 4 fitted terms) reported no possible problem of specification except in regression 5.5.
- Chow break point tests reported no possible structural change between OECD and non-OECD countries except in regression 5.9.
- No problem of non-normality was reported by the Jarque-Bera statistics.



**Table 6: Judicial efficiency in enforcing contracts and the structure of credit markets**

Independent variable is PRIVATE. Estimation method is cross-sectional Ordinary Least Square with White heteroskedasticity-consistent standard errors and covariance. T-statistics are in parentheses. \*, \*\*, and \*\*\* refer to significance values of 10%, 5% and 1% respectively.

Regression Number	6.1	6.2	6.3	6.4	6.5	6.6	6.7	6.8	6.9
Constant	-0.64123 (-4.06)	-0.62062 (-3.75)	-0.36050 (-1.88)	-0.73750 (-4.55)	-0.76101 (-4.24)	-0.51910 (-2.60)	-0.74946 (-3.85)	-0.78415 (-3.78)	-0.65120 (-2.81)
Log(GDPPC)	0.14833 (6.85)***	0.14359 (6.99)***	0.13533 (6.65)***	0.14559 (6.77)***	0.14300 (6.99)***	0.13611 (6.65)***	0.11736 (5.73)***	0.11560 (5.76)***	0.11269 (5.50)***
Inflation	-0.00078 (-2.36)**	-0.00088 (-2.28)**	-0.00084 (-2.35)**	-0.00073 (-2.53)**	-0.00084 (-2.35)**	-0.00082 (-2.42)**	-0.00161 (-6.53)***	-0.00179 (-5.81)***	-0.00173 (-6.33)***
Creditor				0.06644 (2.43)**	0.06317 (2.09)**	0.05181 (1.77)*			
Freedom							0.09886 (2.55)**	0.10128 (2.48)**	0.09710 (2.35)**
Dur	-0.00043 (-3.58)***			-0.00046 (-4.33)***			0.00025 (-2.15)**		
Proc		-0.00391 (-1.06)			-0.00277 (-0.84)			-0.00061 (-0.18)	
Forma			-0.07636 (-2.31)**			-0.06515 (-2.02)**			-0.03029 (-1.13)
R-squared (adjusted)	0.49	0.45	0.49	0.53	0.48	0.51	0.51	0.49	0.50
Observations	73	73	73	72	72	72	61	61	61
Durbin-Watson statistic	2.08	2.08	2.08	2.10	2.09	2.05	2.16	2.17	2.17

Tests for regressions number 6.1 to 6.9: (at 5 percent level of significance)

- Using the White test, non-heteroskedasticity hypothesis could not be rejected in all regressions.
- RESET F-statistics (with 4 fitted terms) reported possible problem of specification in regressions 6.3, 6.5, 6.6, and 6.8.
- Chow break point tests reported no possible structural change between OECD and non-OECD countries.
- Non-normality was encountered in regressions 6.1, 6.2, 6.3, 6.7, 6.8, and 6.9 using the Jarque-Bera statistics.

**Table 7: Judicial efficiency in enforcing contracts and the efficiency of credit markets**

Independent variable is SPREAD. Estimation method is cross-sectional Ordinary Least Square with White heteroskedasticity-consistent standard errors and covariance. T-statistics are in parentheses. \*, \*\*, and \*\*\* refer to significance values of 10%, 5% and 1% respectively.

Regression Number	7.1	7.2	7.3	7.4	7.5	7.6	7.7	7.8	7.9
Constant	24.09759 (5.57)	17.47754 (2.35)	2.03586 (4.05)	22.28468 (4.03)	12.91128 (1.17)	16.88098 (2.05)	21.46529 (5.03)	19.19179 (3.26)	20.63072 (3.462)
Log(GDPPC)	-2.04085 (-4.22)***	-1.73954 (-3.11)***	-1.89561 (-4.23)***	-1.93811 (-3.73)***	-1.50136 (-2.30)**	-1.74793 (-3.53)***	-1.49144 (2.72)***	-1.42079 (-3.20)***	-1.48845 (-3.17)***
Inflation	0.03747 (2.98)***	0.03793 (3.12)***	0.03744 (3.02)***	0.03813 (3.13)***	0.03949 (3.34)***	0.03816 (3.17)***	0.05937 (1.69)*	0.05656 (1.73)*	0.05697 (1.69)*
Creditor				0.04044 (0.39)	0.78666 (0.62)	0.65763 (0.55)			
Freedom							-0.73435 (-0.89)	-0.69333 (-0.88)	-0.69272 (-0.82)
Dur	0.00317 (0.55)			0.00341 (0.53)			-0.00326 (-0.59)		
Proc		0.229032 (1.13)			0.26669 (1.14)			0.03917 (0.24)	
Forma			0.92358 (0.94)			1.15497 -0.92			-0.01693 (-0.01)
R-squared (adjusted)	0.21	0.24	0.22	0.19	0.23	0.20	0.26	0.26	0.26
Observations	62	62	62	60	60	60	52	52	52
Durbin-Watson statistic	1.74	1.75	1.79	1.16	1.16	1.19	2.00	1.91	1.94

Tests for regressions number 7.1 to 7.9: (at 5 percent level of significance)

- Using the White test, non-heteroskedasticity hypothesis was rejected in regressions 7.7, 7.8, and 7.9.
- RESET F-statistics (with 4 fitted terms) reported possible problem of specification in regressions 7.4, 7.7, 7.8, and 7.9.
- Chow break point tests reported no possible structural change between OECD and non-OECD countries.
- Non-normality was encountered in all regressions using the Jarque-Bera statistics.

Judicial enforcement of contracts can have an effect on credit market performance because it influences the risk and costs of credit transactions. This paper documents this point by empirically investigating the relation between the efficiency of judicial systems and credit market development around the world. Data from a new database, the World Bank's Doing Business Database, are applied for the research. The efficiency of the judicial system is measured by its speed and simplicity. Regression results show that, apart from traditional variables such as the level of income or inflation rate, indicators of judicial enforcement were also statistically significant in explaining credit market development. Long litigation processes and complex procedures inversely correlated to indicators of credit market development. Countries with better judicial enforcement display more developed credit markets, represented by a larger size of the banking sector and a higher proportion of credit granted to the private sector.

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