BASEL II: HOW FAILURES IN THE LEGAL, JUDICIARY AND COLLATERAL SYSTEM AFFECT CAPITAL REQUIREMENTS

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Resumen

It is well known that the new capital regulatory framework under Basel II improves financial stability and soundness. However, some pre-conditions are required to implement successfully these recommendations. This document highlights the role played by the legal, judiciary and collateral (LJC) system in the implementation of Basel II in less developed countries.

We identify and measure the impact of inefficient LJC systems on Loss Given Default (LGD). Because LGD is a key risk component of the new framework to measure capital adequacy, this document explains how an inefficient judiciary system, a poor body of property and legal rights or a slow and costly collateral collection procedure may add an implicit charge in capital. In this sense, Basel II should play an additional role in promoting institutional reforms in developing countries to guarantee financial stability and soundness. By using data related to legal restrictions in doing businesses for a large set of countries, we find strong evidence that improving LJC systems reduces the LGD making the impact of implementation Basel II less challenging.

CLASIFICACION JEL: G21, G38, K40

CLAVE: Basilea II, law and finance, banking, loss given default.

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I. Introduction

The new framework to measure capital adequacy considers more risk-sensitive capital requirements. As a consequence, some attention has been put to the fact that banks operating in developing countries may be required to increase capital due to the poor economic and creditworthiness conditions. These suggestions have been confirmed in both the third and the fifth quantitative impact survey (QIS III and V) monitored by the Basel Committee of Banking Supervision in 2003 and 2005. The results of QIS III and V show that countries in Latin America and Eastern Europe may increase capital in between 30% to 70% if they adopt the internal ratings-based (IRB) approach.

Even though it is broadly acknowledged that Basel II improves capital regulation, supervision and market discipline, and despite its role in enhancing further risk management and financial stability, the implementation of Basel II challenges developing countries. Introducing the new capital framework requires a balance between the short-run cost (in terms of capital increase) and the long-run benefit (in terms of a sound and solid financial system.) The short run cost has been identified mainly through economic and creditworthiness conditions that seen to be intrinsic to developing countries. However, the legal and judiciary structure that safeguards agents’ property rights are also important factors whose costs may be reduced through structural reforms. In this sense, and taking the words of Mr Jaime Caruana, Former Governor of the Bank of Spain and Chairman of the Basel Committee on Banking Supervision: “reforms to judicial and legal system belong to the set of pre-conditions that need to be met to guarantee financial stability in the process of implementation of Basel II”.

This document focuses on how an inefficient legal, judiciary and collateral (LJC) system could affect banks’ capital requirements under Basel II. Inefficiencies in the LJC framework have a negative impact on the economic and credit performance of borrowers, having a direct impact on two risk components on the new capital requirement: i) The probability of default (PD) after a one-year horizon, and ii) The loss given default (LGD) as a percentage of exposure at default. Through these two channels, Basel II generates an implicit capital charge for failures in the LJC system that have to be addressed.

In this document we study the impact through the LGD channel. Taking the main insights of the literature on Law and Finance, we explain how LGD is affected directly, and how Basel II built a bridge between LJC failures and capital requirements. Most importantly, we use cross-country data to measure this impact after controlling for macroeconomic factors. We find that the collateral framework explains most of the variations of LGD, followed by the legal tradition and the judiciary system. Using this estimation, we construct a legal-driven LGD that we compare with capital changes due to the introduction of Basel II according to the results of QIS III and V, made by Basel Committee. Our finding is important because we show that legal-driven LGD is significantly related to capital changes. This suggests that improvements in LJC laws will reduce capital requirements under Basel II, improving financial stability.

Inefficiencies in the LJC system can be eliminated through institutional reforms. These reforms have been promoted by international organizations (The World Bank, The International Development Bank, among others) in order to reduce an acknowledged impact on credit access and interest rates. In the same direction, this document suggests that Basel II should contribute to promote the same kind of institutional reforms as a major pre-condition to implement the most advanced methods of capital adequacy and to assure financial soundness and stability. By restructuring the collateral law and reforming the judiciary system in developing countries, the cost of implementing Basel II will be largely reduced, thus generating a strong incentive to adopt the recommendations of the new capital accord.

In the first section of the document we analyze the economics of LGD and its determinants. Then, we review the law and finance literature in the second part. The third section, we merge both analysis and

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1 For a discussion see Powell (2004) and Bailey (2005).
2 Many countries in developing regions were not included in this survey.
4 One minus the loan recovery rate of the credit loss incurred if an obligor of the bank defaults.
then discuss the link between the judiciary and legal framework and LGD. We illustrate how bank capital under Basel I, due to its simplicity, was immune to inefficiencies in the law and legal institutions. Nevertheless, Basel I was also risk insensitive which generated potential regulatory arbitrage. The next section uses a data set of 116 countries to measure the impact of LJC system variables on LGD. We discuss our results and compare them with the impact on capital requirements obtained from QIS III and V. The last section concludes and offers a list of recommendations to facilitate the implementation of Basel II in order to improve financial stability.

II. Determinants of Lost Given Default (LGD)

Defining LGD is not always an easy task. As Resti and Sironi (2005) point out, the loss given default (LGD) plays an important role in the New Basel Accord, known as Basel II and implies a measurement of the banks’ recovery capacity to collect the resources allocated on a specific project made by borrowers. Therefore, the definition of LGD is related to the definition of default. In this sense, Schuermann (2004) mention that a financial investment can experiment a loss only if there has been previously a state of default. Therefore LGD is a state contingent variable with the event of default. For that reason, by defining default, which there is not a standard definition nowadays in the banking industry and academia, we can obtain different measurements of LGD.

However, by taking the right explanatory variables that influence the recovery rate parameter; this definition bias can be minimized. Gupton (2005) mentions that accurate calculation of LGD forecast are a pivotal factor for lending, investing and trading of financial instruments. LGD is also crucial for calculating credit losses and the economic capital need to cope with expected and unexpected losses. Inaccurate estimation of this variable is dangerous for banking business and the regulatory process to fulfill capital requirements to keep financial system soundness. Therefore, following BIS (2005), the definition and calculation of LGD must include all material discount effect, as well as material direct and indirect costs associated with collecting the exposure.

Peter (2006) provides an interesting definition of economic losses and LGD. He assumes that economic losses are the change in the value of the facility that banks faces due to the event of default. Following his analysis, we have:

\[
\text{Loss (tdf)} = \text{NPV}(\text{T}_{\text{df}}, p) - \text{NPV}(\text{t}_{\text{df}}, \text{np})
\]

Where \(\text{NPV}(\text{T}_{\text{df}}, p)\) describes the value of a performing facility at the time to default. The value of the performing facility is generally approached by the amount outstanding at the time of default plus any eventual further drawing after default that is represented in the total exposure at default (EAD). The residual value of the defaulted facility \(\text{NPV}(\text{t}_{\text{df}}, \text{np})\), can be expressed as the net present value of all recoveries from the exposure adjusted by all direct and indirect costs arising from the event of default. Therefore, the LGD of a facility follows the ratio of economic loss to exposure at default:

\[
\text{LGD} = \frac{\text{EAD}(\text{t}_{\text{df}}) - \text{NPV}(\text{REC}(t), t \geq t_{\text{df}}) + \text{NPV}(\text{Costs}(t), t \geq t_{\text{df}})}{\text{EAD}(t_{\text{df}})}
\]

With \(\text{NPV}(\cdot)\) as the net present value, \(\text{REC}(\cdot)\) and \(\text{Costs}(\cdot)\) are the recoveries and costs associated at time \(t\), respectively. Negative economic loss or LGD indirect gain can happen in real life, however this is not observed frequently and it is not an possible situation in less developed countries, from which, LGD estimates are required to be restricted between 0 and 1, as percentage of EAD.

To calculate the LGD, much attention has been put to the bank-related and macroeconomic determinants of LGD. Schuermann (2004) identifies four factors which drive significant differences in LGD: place in the capital structure, presence and quality of collateral, industry, and timing of the business cycle. Using micro level data, Schuermann finds that seniority and collateral are the most important determinants of debt recovery: It is critical to be first in line during the bankruptcy negotiations. Some studies found that
syndicated loan recoveries for senior secured debt average 70%, while senior unsecured debt average 52%. Experience of Swedish small business bankruptcies report that senior claims recovering 69% on average, while junior claims receive only 2%. Historical data from Moody’s shows that the mean recovery rate for senior secured instruments is 54.3%, for senior unsecured 38.7%, for senior subordinated 28.5%, for subordinated 34.7% and for junior subordinated instruments 14.4%. Industry is also a factor that affects recovery rates. In a study using American defaulted securities from 1982 to 1999, Acharya et al. (2003) found that defaulting companies whose industries have also suffered adverse economic shock face significantly lower recoveries. However, the data could not support two specific explanations, namely: 1) companies that operate in more concentrated industries should have lower recoveries due to the lack of an active market of bidders; and 2) Poor liquidity position of industry peers when a firm defaults should lower the recovery on its debt. Finally, there is a broad literature showing that the business cycle or the macroeconomic conditions has an impact on recovery rates. There is strong evidence that recoveries in recessions are lower than during expansions. By using Moody’s data, Schuermann (2004) found that the recovery mean during expansions was 41.4% and that these recovery rate values were more even than recovery rate values during recessions, whose mean was lower (32.1%).

III. The Law and Finance Perspective

There is important literature studying the impact of judiciary system efficiency on economic performance (Messick, 1999; Botero et al., 2001). A good judicial system contributes to safeguarding the rule of law and supports economic development by facilitating and promoting various interactions and transactions in economic and social domains. In addition, it has been shown that poor legal codes, contract enforcement mechanisms and information disclosure systems discourage financial development and hence economic performance. The recent Law and Finance theory (La Porta et al., 1998) establishes that different legal traditions differ in the degree they protect outside investors (bondholders and creditors) and private property owners, and the way they adapt to change in business. This view is supported by a large empirical literature that acknowledges that countries with a French legal tradition—in contrast with English common law and German civil law—tend to have weaker financial institutions, less transparent corporate financial statements, poorer property protection rights, weaker protection of the rights of shareholders and debt holders, and lower levels of stock market and bank development (Beck et al., 2001.)

As Beck et al. explain, the Law and Finance theory states that legal traditions were shaped by differences associated with the relative power of the monarch and property holders. For example, the English common law evolved to protect private property owners against the Crown. This facilitated the ability of private property owners to transact confidently. On the other hand, France and Germany did not have powerful Parliaments, and as a consequence, the codification of the French and German civil codes under Napoleon and Bismarck in the nineteenth century under solidified State dominance of the courts. Over time, State dominance produced legal traditions that focused more on the power of the State and the protection of the politically connected heads of firms, and less on the rights of individual investors. According to the Law and Finance view, these legal traditions spread throughout the world through conquest, colonization, and imitation, so many of the international differences in financial institutions today can be traced back to the prevailing influences of different legal traditions. A complementary theory is the dynamic Law and Finance view. This view states that legal traditions differ in terms of their abilities to adapt to changing conditions. The comparative law literature suggests that the common law is inherently dynamic, while the civil law, particularly the French civil code, was born with the utopian goals of creating a perfect, immutable legal code. Thus, in theory, there is a static nature to civil law.

A more specialized literature taking the same direction focuses on the impact of judiciary system efficiency on credit markets. In particular, inefficient judiciary systems could create an ex-ante perverse incentive in the firm’s manager who may display insufficient effort or just be unwilling to repay, thus increasing the

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5 Schuermann (2004.)
6 See Beck et al. (2001) for a review of this literature.
7 In particular the English common law, the French civil law, and the German civil law.
probability of strategic default. The probability of a strategic default increases when a borrower’s benefit of defaulting is greater than the perceived cost of sanctions associated with default. With poor judicial enforcement and legal systems that assign low protection to creditor’s rights, both the probability of default and the loan recovery are affected. The probability of default increases because poor court enforcement opens –with a probability proportional to the degree of court efficiency and corruption- a channel through which the borrower may avoid the cost of default. The loan recovery (LGD) falls due to i) lower protection of creditor’s rights, ii) lower effectiveness of enforcement, and iii) weaker institutional arrangements like property registries and bankruptcy procedures.

In concordance to the law and finance view, a growing literature has focus on the collateral framework, arguing that poor systems destroy the ex-post value of collateral, and consequently reducing LGD. The institutional problems related to poor collateral systems include: i) lack of clear and comprehensive legal provisions for non-possessory security interests, ii) priority provisions that disfavor secured creditors, iii) inadequate and costly registration procedures, and iv) over-dependence on unreliable court systems (Cadwell and Meagher, 1996.) In addition, Fleisig (1996) finds important flaws in the legal framework that govern the use of property as collateral or security for a loan, regardless of whether their legal systems are based on civil or common law. He identifies three obstacles that prevent the use of movable property as collateral in developing countries: The creation, the perfection and the enforcement of security interests. Creating security interests is difficult, expensive, and uncertain due to the restrictive and confusing rules governing public registries. The perfection of security interests is related to their publicity and priority. The law does not give a clear ranking of priority to lenders, and primitive registries limit publicity of security interests, making the practical determination of lender priority difficult or even impossible. This ineffectiveness makes valuable property worthless to lenders as collateral. In many transition countries, a lender has no idea how many times a borrower has used the same property as collateral. If the borrower defaults, only the bank that files a lien the fastest will be able to back up the loan, and the other banks will report an LGD of 100%. The enforcement of security interests is related to the repossession and sale of collateral. In developing countries, this process is slow and expensive. In Uruguay, this process requires six months to two years. In Peru, the repossession and sale of collateral lasts two years and seven months on average. In Bolivia, court-processed debt collection lasts an average of one year and ten months to be carried to the point of collection. Fleisig explains that in order to get around the difficulties of repossession and sale of collateral, some lenders simply seize and sell the collateral without the sanction of law. For large and valuable pieces of equipment, dealers in every developing country tell tales of armed dispatching men and bribing police to recover machinery at gunpoint. In other countries, lenders use a post-dated check to covert the civil offense of nonpayment into a criminal act. The postdated check will be demanded in the amount of the loan and interests on the date the credit is due. If the borrower cannot pay, the lender deposits the check in a bank and the check is returned unpaid with criminal consequences for the borrower as this is considered fraud. If the legal system implies that collection procedures take more than two years, even the slightest administrative and court costs involved in the enforcement proceedings are likely to consume much of the residual value of movable assets, increasing LGD.

IV. Basel II: The impact of legal institutions on capital requirements

Although the capital framework under Basel I promote banking soundness, it is not quite sensitive to risks. In that regard, regulation based on Basel I made capital’s bank immune to institutional factors that could

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8 Bolton and Scharfstein (1996) define strategic default as the case in which a firm defaults because managers want to divert cash to themselves.

9 In a series of surveys for Latin America conducted by Heywood W. Fleisig and Nuria de la Peña from the Center for the Economic Analysis of Law, Washington, it has been shown that problems in the framework for secured transactions destroy the value of collateral, limiting access to credit.

10 Arrieta y Luy (2004.)
11 Fleisig et al. (1997.)
12 Fleisig (1996.)
13 Fleisig, et al. (1997.)
14 Garro (1998.)
affect credit, market or operational risk. Following the Law and Finance, an inefficient judiciary system could create an ex-ante perverse incentive in the firm’s manager that may increase the probability of strategic default. With poor judicial enforcement, and with a weak legal system and collateral law, the loan recovery will be affected. More specifically, collateral value –and consequently, loan recovery rates- is reduced because of a system that i) delays the collection procedure after default, ii) imposes high administrative and court costs, iii) increases uncertainty in the final legal resolution, iv) opens doors to corruption, and v) creates implicit protection to defaulters.

Through these channels, creditors respond by reducing the availability of credit and increasing the interest rate. These two effects have been documented in the theoretical and empirical literature (Bianco, 2001; Beck et al., 2004; Meador, 1982.) In Figure 1 we confirm the effect of loan recovery (LGD) on credit and interest rates using a set of 69 countries\textsuperscript{15}. The impact on credit -measured as the ratio credit to GDP- is negative and strongly significant. The impact on real interest rate is negative, but not too strong, which is consistent with some literature (see Bianco, 2001.) It should be noted that this impact could be affected by endogeneity problems (i.e. interest rates and credit intermediation affect LGD.) Nevertheless, the correction of this problem does not belong to the scope of this document.

![Figure 1: Effect of LGD on Credit Access and Real Interest Rates](image)

Figure 1 is consistent with Basel I, where a poor judiciary system has only one channel to affect banks: credit quality. Under Basel I, capital is not affected directly because any deterioration of credit quality due to deficiencies in the judiciary, legal or collateral system is solved by reducing credit access or increasing interest rates in order to keep returns unaffected.

An important change embedded in Basel II, is that the new framework to measure capital adequacy\textsuperscript{16} considers more risk-sensitive capital requirements. In particular, the internal ratings-based (IRB) approach considers two key risk components in determining the capital requirement for a given exposure: probability of default (PD), and loss given default (LGD). Consequently, factors affecting banks’ risk are directly incorporated in additional capital requirements through higher PD or LGD. Therefore, we should expect that banks located in countries with inefficient judiciary systems must be implicitly charged with additional capital in order to cover for the effects of the judiciary on credit risk.

LGD in the Basel II framework is considered in both frameworks the standardized and IRB models. In the standardized approach, LGD is considered in the following ways: i) a more favorable treatment in some portfolios like mortgage and SME, ii) as an adjusted-value collateral through supervisory haircuts and iii) as counterparty risk weight. In the IRB approach there are also two ways for counting LGD. In the Foundation Approach, LGD enters in regulatory capital computation as one of the key parameters set by the regulator. As in BIS (2005), basic LGD is fixed at 45% for all senior and unsecured debt and at 75% for subordinated exposures. However, LGD is adjusted in any direction when replaced by a system of minimum and maximum thresholds based in the coverage ratio (value of collateral/exposure at default). In the advanced approach, LGD is estimated for banks as part of their facility rating system, using historical

\textsuperscript{15} For more details of the data used, refer to the data section of this document.

\textsuperscript{16} BIS, 2005.
recovery rates. LGD in this case must be a long run estimate, which accounts for any possible correlation with default and with the risk of downturn credit cycle. As BIS (2005) mention LGD should not be lower than “the long-run default weighted average loss rate given default calculated based on the average economic loss of all observed default”.

As we can see in Figure 2, changes in LGD would imply a parallel movement of the risk weight functions of IRB and therefore, a significant increase of the capital requirement, higher than the PD impact. In this sense, by increasing the recovery rate and improving all procedures for collecting collaterals, the impact of the new Basel II framework in less developed countries could be similar to those countries which IRB formulae has been calibrated. Then, higher LGD, as expected in less developed countries, implies that the most advanced methodologies to calculate economic capital would be unattractive for risk management.

![Figure 2: Risk Weight Function if LGD Changes](https://example.com/figure2.png)

In order to estimate the LGD factor, we have to model the recovery rate of a default borrower. We follow Dullman and Trap (2004) and Rosch and Scheule (2006) by using a logistic normal process of the LGD factor. Let define:

\[
LGDi = 1 - R(it)
\]

Where LGD is the loss given default rate (as percentage of EAD) and R(t) is the recovery rate for individual i at period t. Let also define the transformation variable Yt in a logistic process:

\[
YGd = \text{Log} \left( \frac{LGD_i}{1 - LGD_i} \right)
\]

Therefore, to estimate LGD we need to convert the previous equation and linearize it as follows:

\[
LGD_i = \frac{\exp(YGd)}{1 + \exp(YGd)}
\]

And:

\[
YGd = a + bX_i + dZ_i + v_i
\]

Where, a, b and c are parameters, X_i is the vector of borrower individual characteristics and Z_i is the vector of macroeconomic and institutional variables common to all individuals. The variable v_i is the usual error term.

Like Frye (2000) mention, this kind of transformation has the advantage of being bounded between 0 and 1. We can extend the analysis to include multifactor models, as Rosch and Scheule do, in order to include not only macroeconomic factors, but also other systemic factors like structural and institutional variables like government regulation and the LJC systems. Note that if we have homogeneous borrowers, then the transformed LGD function is given by the average of individual LGDs. In an aggregate model, the average of individual LGDs become a constant:

\[
YGd = c + dZ_k + v_k
\]
In the next section we use these aggregate model to analyze a cross-section of \( k \) countries with different legal traditions, macroeconomic conditions, institutional arrangements and banking development, and evaluate how this variables could challenge the application of Basel II in less developed countries.

V. Data and Estimation

For the empirical section of this document, we estimate the previous model using a set of 116 countries. The data for our proxy of LGD and for legal, judiciary and collateral characteristics comes from the Doing Business in 2006 database\(^{17} \). The Doing Business data is based on research of laws and regulations, with input and verification from more than 3,000 local government officials, lawyers, business consultants, and other professionals who routinely administer or advise on legal and regulatory requirements. The data was collected by January 2005 and in most cases refer to each country’s most populous city. Since there is not a source for loan recoveries, we use the recovery rate through bankruptcy proceedings as a proxy. In particular, LGD is defined as \( 1 \) minus the recovery rate\(^{18} \). We think this is a good proxy for LGD because there is a strong relationship between the efficiency of collateral and bankruptcy systems. Because countries with poor collateral laws usually have poor bankruptcy codes, one should expect a strong and positive relationship between recovery rates from a defaulted secured loan and a bankruptcy proceeding. Table A1 in the appendix lists the countries used in this document, and our proxy for LGD.

A second source of data is related to the country’s legal origin that comes from Djankov et al. (2002.) Countries are classified according to their legal origin: English common law, French civil law, Socialist civil law, Other civil law (German and Scandinavian civil law), and other (Muslim, mixed systems, etc.) Finally, macroeconomic variables were obtained from the International Financial Statistics (IMF) and the World Development Indicators (World Bank). The list and description of all variables are reported in Table A2 in the Appendix.

In order to identify the importance of factors related to judiciary and collateral system, legal origin, and macroeconomic variables, we estimate the following linear regression based in the model detailed in the previous section:

\[
LGD_k = \text{legal origin}_k + \text{collateral}_k + \text{judiciary}_k + \text{macroeconomics}_k + \nu_k
\]

The results are reported in Table 1. The legal origin explains up to 18% of LGD (Column 1.) The incremental \( R^2 \) in explaining LGD from collateral system variables is around 40% (Column 2.) The judicial system variables explain about 5% of the residual variation in LGD (holding the legal origin and the collateral system constant). Finally, macroeconomic variables explain about 3% of the residual variation in LGD (holding all other factors constant.)

<table>
<thead>
<tr>
<th>Table 1: Determinants of LGD</th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>82.845*</td>
<td>58.431*</td>
<td>61.113*</td>
<td>58.288*</td>
</tr>
<tr>
<td>(15.627)</td>
<td>(7.010)</td>
<td>(6.311)</td>
<td>(6.122)</td>
<td></td>
</tr>
<tr>
<td>Legal origin dummies</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>English legal system (Common Law)</td>
<td>-31.553*</td>
<td>-10.072***</td>
<td>-5.584</td>
<td>-8.812</td>
</tr>
<tr>
<td>(4.475)</td>
<td>(-1.751)</td>
<td>(-0.990)</td>
<td>(-1.583)</td>
<td></td>
</tr>
<tr>
<td>Other legal systems (Civil Law)</td>
<td>-26.090*</td>
<td>-11.207***</td>
<td>-11.656**</td>
<td>-15.581*</td>
</tr>
<tr>
<td>(3.480)</td>
<td>(-1.909)</td>
<td>(-2.071)</td>
<td>(-2.764)</td>
<td></td>
</tr>
<tr>
<td>French legal system (Civil Law)</td>
<td>-16.007**</td>
<td>-9.946***</td>
<td>-10.905**</td>
<td>-11.261**</td>
</tr>
<tr>
<td>(-2.396)</td>
<td>(-1.938)</td>
<td>(-2.235)</td>
<td>(-2.351)</td>
<td></td>
</tr>
</tbody>
</table>

\(^{17}\) www.doingbusiness.org

\(^{18}\) Fraction or cents on the dollar that claimants (creditors, tax authorities, and employees) recover through bankruptcy proceedings or similar settlements when a default occurs.
Column 1 is important because it shows that legal origin matters. The omitted dummy includes other forms of legal traditions that imply higher LGD than English common law, French civil law, Scandinavian and German civil law, and socialist civil law. Our result is consistent with empirical literature using legal origin as variables to explain development, credit access, etc. In a related document (Djankov et al., 2002) the authors used information collected from Lex Mundi member law firms in 109 countries, and found that almost 40% of their formalism index related to the collection of a bounced check was explained by countries' legal origin. Their estimation also found that common law countries have a better performance than civil law countries, and within those, French civil law countries perform worst followed by socialist, Scandinavian and German civil law countries. Although their formalism index for the check collection is not a measure of recovery rate, it affects LGD directly.

Three variables are related to the collateral system performance: getting credit, closing a business, and registering property. All are significant and have the expected sign. The negative coefficient for the variable getting credit suggests that when collateral and bankruptcy laws facilitate lending, LGD is reduced. According to the World Bank, stronger legal rights and more information sharing are associated with deeper credit markets and lower default rates, that is, more credits are extended when legal rights are stronger and quality credit information is available.

The positive coefficient for closing a business shows that as the time to close a business (in years) increases, LGD also increases. According to the World Bank (2006), bottlenecks in bankruptcy are often associated with inefficient judiciary institutions. As well, countries with inefficient judiciary institutions are

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19 In particular Muslim, customary and a mix of civil and common laws.
20 The index measures substantive and procedural statutory intervention in judicial cases at lower-level civil trial courts.
better off without sophisticated bankruptcy systems, because laws could, in practice, exacerbate legal uncertainty and delays in developing countries.

The positive coefficient for registering property suggests that as the cost to register property (as a percentage of property value) increases, LGD also increases. Adequate and efficient property registration reduces transaction costs.

Controlling for collateral system variables (column 2) slightly affects the impact of legal origin on LGD, since the impact of common law is reduced below the levels of other civil laws (German and Scandinavian.) However, the statistic significance of all legal origin system are reduced, and in the case of socialist civil law countries it becomes non-significant. This implies that some deficiencies in legal tradition system are partially captured in the collateral system. This fact becomes stronger when we include judiciary system variables (column 3.) In this case, the order of the impact of the legal origin change and the statistical significance is eliminated for the England common law and the French civil law. This effect is reasonable because most of the characteristics of the legal tradition are already captured by the judiciary system variables.

The two variables describing the judiciary system are significant and have the right sign. The positive coefficient for enforcing contracts suggests that more days to resolve a dispute may increase LGD in case of a default. Efficient contract enforcement encourages businesses to engage with new borrowers or customers. Courts are the formal institution that should enforce contracts, therefore when they are inefficient and corrupt businesses will rely on other mechanisms that generate higher costs or will adopt conservative business practices.

The negative coefficient for the protecting investors’ variable suggests that as there is more protection for the minority shareholders against misuse of corporate assets, LGD will be lower. If the rights of investors are not protected, investment projects will be fewer and less profitable.

It is important to notice that after including judiciary system variables, the impact of collateral system variables is reduced. In particular, the coefficient for registering properties becomes statistically non-significant. By comparing the effects in column 2 and 3, we can argue that the judiciary and collateral systems are related, and that some effects of the collateral system are captured by in the judiciary system.

Finally, column 4 reports the full regression including two macroeconomic factors: Inflation and GDP growth. Inflation is positive and significant because it creates instability and destroys collateral value, increasing LGD. GDP growth, however, is non-significant and with the wrong sign. Macroeconomic factors do not change the statistical significance of the other variables, but reduces the magnitude of the collateral and judiciary system impact on LGD. According to our full regression, the LJC system together with the macroeconomic variables explains up to 65.8% of variations of LGD across countries.

VI. Discussion of Results

Our estimation shows that inefficiencies in the collateral system have a large impact on LGD. Additionally, the judiciary system and the country’s legal tradition affect loan recovery. Therefore, through their impact on LGD, countries with poor collateral and judiciary systems are prompted to be more affected to the new changes in capital requirement proposed by Basel II. To verify this channel, we calculate an estimated LGD driven by the collateral, judiciary and legal system only. This legal-driven LGD subsumes all the failures in the LJC frameworks that have some effect on LGD. Because we do not have access to detailed results of QIS III and V, we grouped countries according to the OWC report. In Figure 3 we compare

21 The results of the third quantitative impact survey (QIS III) collects the impact of Basel II on capital requirements for more than 350 banks in 43 countries, and the results of QIS V collects other important number of banks worldwide.

22 We did not have access to this report. The data, however, was obtained from a speech of the BBVA for the IDB seminar on Basel II in March 2004.
the impact of the new framework to measure capital adequacy -IRB foundation and IRB advanced- and the estimated LGD driven by collateral, judiciary and legal system variables.

There is a strong correlation between legal-driven LGD and change in capital requirement according to QIS III, and the same is shown under QIS V. Developed regions (North America and Europe, excluding Eastern Europe) have a low impact on capital requirements and low levels of legal-driven LGD, with the exception of Italy. On the other hand, developing regions that completed QIS III or V (Latin America and Eastern Europe) have a larger LGD that is associated to larger impacts on capital requirements. Although QIS III does not include countries in other regions, our estimates projected that African countries would be largely affected, almost at the same level as Latin American economies. Asia and other developing regions would be also considerably affected, as it can be deduced from Figure 3.

As we can observe by the results of the previous section, countries failures in their judicial, legal and collateral systems will have a large impact on capital requirements under Basel II. As Poggi, et al. (2005) points out, the implementation cost could be high enough to eliminate incentives to move on to more risk-sensitive techniques in developing countries which results in regulators asking for i) delays in the implementation of Basel II, ii) changes in key parameters or assumptions in order to smooth up the stylized facts from developing countries and to restore the right incentives to migrate to more advanced methods, or even worse, iii) blockage to the new framework pushed by interest groups. Our study shows that improving efficient legal and collateral systems will reduce the cost of implementing Basel II and could help to convince governments about the benefits of adopting Basel II recommendations, without significant changes in the framework proposed.

Our estimation identifies that the collateral system is the most important factor determining LGD. As a consequence, developing countries -generally characterized by inefficient collateral frameworks- are encouraged to promote institutional reforms as an important pre-condition to implement the more advanced approach of Basel II. Within the reforms that are relevant to reduce the sensitivity of bank capital to collateral framework, we consider that those that focus on registries and enforcement are the most important. Reforms that make registry records and restructure public to permit competition, or allow private registries to compete with public ones are going to reduce the administrative restrictions and registering costs, and increase their publicity. Additionally, reforms oriented to unify public registries and set coherent rules about priority in collateral seize are going to reduce uncertainty and preserve collateral value.

Regarding enforcement, Governments should implement legal reforms that made the repossession and sale of collateral faster and cheaper. Two strategies exist for solving this problem: First, permitting private non judicial enforcement of loan contracts. Second, improve the administration of justice. The first strategy implies to change the law to permit private parties to contract for non judicial repossession and

23 Italy is broadly recognized as a country with serious problems in its judiciary system.

24 Fleisig (1996)
sale, preferably, without government intervention. The second strategy considers the case of court-administered collections, and implies to create specialized courts, and improve the selection and training of judges. It also considers the introduction of oral arguments, improvement of equipment, and modernization of systems for case load management, and sanctions against judges for improper conduct.²⁵

VII. Conclusions

Maintaining financial stability in the banking business is an important goal for banking supervisors all over the world. In this sense, Basel II, as FED Governor Schmidt (2005) mention, is “a means to promote broad stability and enhance safety and soundness of financial institutions.”²⁶ But the implementation of Basel II has to be accompanied by some necessary pre-conditions in order to achieve this goal. In this paper, we have reviewed one of the most important pre-conditions: the efficiency in the legal, judiciary and collateral collection systems, with which some developing countries face significant difficulties.

We have shown that an inefficient judiciary system accompanied by long lasting procedures for collateral recoveries have a significant effect on LGD, which is translated in higher capital requirements under Basel II. Through this mechanism, this paper discuss one of the factors explaining why developing countries will probably be more affected in terms of capital by the implementation of the most advanced methods of capital adequacy according to Basel II. Current literature has paid more attention to impact on capital requirements associated to economic and creditworthiness conditions in developing countries through higher borrowers’ PD (see for example Powell, 2004, and Bailey, 2005). However, legal and judiciary factors affecting LGD have been generally omitted, even though they seem to be more important as it has been shown before. The importance relies on while higher LGD implies the IRB curve to shift up in the same proportion of the shock, higher PD only implies a movement along the curve with limited less than proportional impact. Also, when the PD is too high, capital requirement is reduced because all the impact is recognized through provisioning rather than capital, which is not the case of the LGD impact.

In this paper, we encourage the improvement of collateral collection procedures as a main policy to pursue a proper implementation of Basel II recommendations. Also, developing countries would restore the incentive for migrating to more advanced methodologies if a series of reforms were implemented in order to enhance the judiciary system. Among these reforms, we recommend the reduction of the time spent in the collection process of the collateral, by permitting private non judicial enforcement of loan contracts, and by improving the administration of justice through specialized courts and by training specialized judges in financial issues. These policies can contribute not only to reduce interest rates, but also to promote more financial intermediation by allowing access to the credit markets to those economic agents previously rationed.

Because the advanced IRB approach internalizes the social cost of poor collateral systems, emerging countries should be encouraged to implement institutional reforms with a twofold objective: Firstly, to improve financial system stability and soundness, and secondly, to smooth the potential impact on more risk-sensitive capital requirements introduced by Basel II. Supervisors are encouraged to promote the adoption of internal rating based models by banks, because they are a reliable measurement of banking risk.

In summary, a reduction of the inefficiencies of the collateral system, together with the implementation of Basel II, will help create better incentives to use more sound and risk-sensitive capital regulation, and assure a more stable financial system, which is the goal of financial supervision organizations worldwide.

²⁵ Fleisig (1997)
²⁶ Remarks by Governor Susan Schmidt at the Central Bank of Turkey internacional Conference on Financial Stability and Implications of Basel II, May. 17, 2005
### Table A1: List of Selected Countries and LGD

<table>
<thead>
<tr>
<th>Country</th>
<th>LGD</th>
<th>Country</th>
<th>LGD</th>
<th>Country</th>
<th>LGD</th>
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<tr>
<td>Albania</td>
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<td>Paraguay</td>
<td>86.6</td>
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<td>India</td>
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<td>80.7</td>
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<td>Mauritius</td>
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<td>Pakistan</td>
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</table>

- **Sample: 116**
- **Mean: 64.39**
- **Median: 69.50**
- **Standard deviation: 26.26**
Table A2: Description of variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>Description</th>
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<tr>
<td><strong>Legal Origin Dummies</strong></td>
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</tr>
<tr>
<td>English legal system</td>
<td>This variable is equal to one if the country's legal system is based on English Common Law, and zero otherwise.</td>
</tr>
<tr>
<td>French legal system</td>
<td>This variable is equal to one if the country's legal system is based on French Civil Law, and zero otherwise.</td>
</tr>
<tr>
<td>Socialist legal system</td>
<td>This variable is equal to one if the country's legal system is based on Socialist Civil Law, and zero otherwise.</td>
</tr>
<tr>
<td>Other legal systems</td>
<td>This variable is equal to one if the country's legal system is based on German Civil Law or Scandinavian Civil Law, and zero otherwise.</td>
</tr>
<tr>
<td><strong>Collateral System</strong></td>
<td></td>
</tr>
<tr>
<td>Closing a business</td>
<td>This variable analyzes the weaknesses in the bankruptcy law and the main procedural and administrative bottlenecks in the bankruptcy process. It indicates the average time, in years, to complete a procedure.</td>
</tr>
<tr>
<td>Getting credit</td>
<td>This variable is a Legal Rights Index, which measures the degree to which collateral and bankruptcy laws facilitate lending. This index measures ten powers of borrowers and creditors in collateral and bankruptcy laws, including whether:- general rather than specific descriptions of assets and debt are permitted in collateral agreements (expanding the scope of assets and debt covered); any legal or natural person may grant or take security over business credits; a unified registry including charges over movable property operates; security provides priority both in and outside bankruptcy; parties may agree on enforcement procedures by contract; creditors may both seize and sell collateral out of court, no automatic stay or “asset freeze” applies upon bankruptcy, and the bankrupt debtor does not retain control of the firm. A minimum score of 0 represents weak legal rights and the maximum score of 10 represents strong legal rights.</td>
</tr>
<tr>
<td>Registering property</td>
<td>This variable measures the ease of registering property, assuming a standardized case of an entrepreneur (part of a limited liability company) who wants to purchase land and building in the largest business city. It indicates the costs, such as fees, transfer taxes, stamp duties, and any other payment to the property registry, notaries, public agencies or lawyers. The cost is expressed as a percentage of the property value, calculated assuming a property value of 50 times income per capita.</td>
</tr>
<tr>
<td><strong>Judiciary System</strong></td>
<td></td>
</tr>
<tr>
<td>Enforcing contracts</td>
<td>This topic looks at the efficiency of contract enforcement by following the evolution of a payment dispute and tracking the time, cost, and number of procedures involved from the moment the plaintiff files the lawsuit until actual payment. The variable used is the associated time in calendar days to resolve the dispute, it is measured as the number of days counted from the moment the plaintiff files the lawsuit in court, until the moment of settlement or, when appropriate, payment (includes both the days where actions take place and waiting periods between actions).</td>
</tr>
<tr>
<td>Protecting</td>
<td>This topic measures the strength of minority shareholder protections against misuse of minority shareholder rights.</td>
</tr>
</tbody>
</table>
investors of corporate assets by directors for their personal gain. The variable used is a Transparency of transactions index (Extent of disclosure), that varies from 0 to 10 with higher values indicating more protections or higher disclosure. This index comprises approval procedures, immediate disclosure to the public and shareholders of proposed transactions, disclosure in periodic filings and reports, and availability of external review of transactions before they take place.

Macroeconomic factors

<table>
<thead>
<tr>
<th>Variable</th>
<th>Description</th>
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<tr>
<td>Inflation</td>
<td>This variable is calculated as the annual change in the consumer price index. The average annual inflation for 4 years is used (2000-2004).</td>
</tr>
<tr>
<td>GDP growth</td>
<td>This variable is calculated as the real annual growth in gross domestic product. The average annual growth rate for 4 years is used (2000-2004).</td>
</tr>
</tbody>
</table>

IX. References


Djankov, Simeon, Rafael La Porta, Florencio Lopez-de-Silanes, and Andrei Shleifer (2002.) “Courts”, mimeo.


La Porta, Rafael; Lopez-de-Silanes, Florencio; Shleifer, Andrei; and Vishny, Robert W. "Law and Finance," Journal of Political Economy, 1998, 106(6), pp. 1113-1155


