New laws and private credit

Nicolae Stef[1], Alexandre Pourchet[2] and Jean-Loup Soula[3]

Abstract This study assesses the *ex-post* financial impact of new laws on the private credit. Using a panel data set of 33 countries over the 2003-2016 period, we confirm that the number of new laws financially matters. An increase of the number of new laws enacted by the parliaments of developed countries significantly hampers the credit extension. The weak adaptability of debtors to severe legal changes may reduce their loan reimbursement capacity leading to a reduction of the domestic credit. In addition, banks tend to value more the legal changes over the legal stability only in the developed countries that have public institutions of moderate quality. Surprisingly, the growth of the private credit provided by banks does not benefit from the enactment of more new laws in the developing countries. Those banks probably anticipate the need of the developing countries to change the legal system through the adoption of new laws.

Keywords Private credit, New laws, Legislators, Development

JEL Classification G21 G28 K10

[1] CEREN, EA 7477, Burgundy School of Business - Université Bourgogne Franche-Comté, Burgundy School of Business, Department of Accounting, Finance & Law, 29 Rue Sambin, 21000 Dijon, France. E-mail: nicolae.stef@bsb-education.com (Corresponding author)
[2] CEREN, EA 7477, Burgundy School of Business - Université Bourgogne Franche-Comté, Burgundy School of Business, Department of Accounting, Finance & Law, 29 Rue Sambin, 21000 Dijon, France. E-mail: alexandre.pourchet@bsb-education.com
[3] EM Strasbourg Business School, LARGE, University of Strasbourg, France. E-mail: jlsoula@unistra.fr

1. Introduction

Lending is one of the main role fulfilled by a bank. The various crises that have developed throughout the world in recent years either economic or political, changed the way the banks do business and operate their lending activities. In this sense, a significant amount of attention has been devoted to the phenomenon of credit policy (Goodfriend, 2014). The banking policy of credit extension has usually been analyzed through the monetary policy (Orzechowsky, 2014) or through the impact of liquidity constraints (Webb, 2010). Moreover, the financial institutions are not able to liquidate loans without a significant cost whenever the withdrawals by depositors are too important. In the light of a bank run phenomenon (Diamond and Dybvig, 1983; Dimanond and Rajan, 2001), such threat can discipline the screening and the debtors' monitoring engaged by banks. Hence, the notions of debtors' risk and trust are essential determinants of the bank's credit policy. Consequently, the banks are obliged to assess the default risk of each debtor prior the decision to grant a new loan (Finlay, 2008).

In that context, the quality of the institutional framework is critical because the lending activities can be subject to higher transaction costs (Williamson, 1985, 2000; Teece, 1986; North, 1990) than most classical banking operations, mainly due to the asymmetric information between the lender and the borrower. Conventionally, economic shortcomings may emerge from the poor quality of public institutions. In the presence of a lower institutional quality, the average level of the firm's productivity and the amount of private investment can decrease (Jude and Levieuge, 2017). Moreover, it may also lead to more market uncertainty and an increase of the production costs (Cuervo-Cazurra, 2008). Conversely, high quality institutions can reduce the transactions costs (North, 1990, 1991) favoring the economic development and the extension of the private credit granted by the banking system. However, a world without uncertainty and lack of information is unrealistic, so for North (1990) all the transactions contain a risk premium that depends on the institutional quality. The property rights protection and the contract enforceability are some of the legal dimensions that can define the quality of institutions (Djankov et al., 2007). In sum, numerous studies show the importance of institutional variables, supporting the idea that an efficient legal framework can reduce the economic uncertainties.

A legal system evolves through the new laws enacted by the legislators. The intensity of legal changes affects the behavior of economic agents including banks or other financial institutions. In this study, we investigate how the new laws determine *ex-post* the credit policy of the banking system. Using a panel data set of 33 countries over the 2003-2016 period, we

examine which theoretical argument justifies that relationship. On the one hand, the *mechanism of natural selection* argues that the legislators tend to replace the inefficient laws with laws more adaptable to the current economic and social environment of the country. Therefore, the selection hypothesis posits that the new laws improve the legal system and thus contribute to the credit growth. On the other hand, the *mechanism of default risk* argues that the weak adaptability of debtors to severe legal changes should diminish their capacity of loan reimbursement leading to a contraction of the domestic credit.

The analysis of the financial relevance of the new laws is of major importance. Firstly, the assessment of the financial effects of the legal inflation, i.e. the adoption of an important amount of new laws, allows to understand if its impact on the banks' lending policy depends on the economic environment. In this sense, we differentiate the countries according to their development degree, either developed countries or developing countries. Secondly, banks can also adapt the lending offer according to the quality of the public institutions. Severe legal changes may be associated with some adverse financial effects in the presence of public institutions of high quality. Hence, our paper will examine for the first time how the lending policy of banks is determined by the trade-off between the legal stability and the quality of the institutional environment. Thirdly, this study also aims to reveal if the financial sector can benefit from large amounts of new laws. Consequently, lawmakers that seek financial development may use the legal inflation as a tool for protecting the financial sector.

The structure of the paper proceeds as follows. In the second section, we present the main legal determinants of the private credit as identified in the law and finance literature, but also our theoretical justifications for the relationship between the new laws and the private credit. The third section describes our sample and its variables. The fourth section presents our estimations, the robustness checks and the main caveats of our econometric approach. The last section discusses the results and the main conclusions of the paper.

2. Financial relevance of new laws

In this section, we first provide an overview of different studies that examined how the legal design and the legal changes affected the amount of private credit. In the second part, we shall provide some theoretical arguments that may explain the *ex-post* impact of new laws on the private credit.

2.1 Legal determinants of the private credit

Studies of the relationship between the law and the private credit developed following the seminal work of La Porta et al. (1997). Moreover, La Porta et al. (1998, 2008) constructed different measures aimed to capture the quality of the laws through the protection level of the interests of shareholders, creditors, and workers. By classifying the countries according to their legal origin, La Porta et al. (2008) argued that the English common law countries tend to be more market-friendly than the civil law countries: those legal systems provide higher levels of protection of shareholders and creditors and thus are associated with a higher level of private credit.

Other studies proposed different judicial variables as determinants of the private credit. For instance, other research integrated the ability of the different institutions to share valuable information about the debtor's credit history or the number of days required to enforce a contract. Empirical results indicate that stronger legal rights and better information sharing are associated with higher private credit. That effect of the legal environment is more significant for the developed countries than for the developing countries (Djankov et al. 2007, Nana, 2014). Djankov et al. (2007) further investigated the effect of legal reform. They find that reforms improving the creditors' rights and the information sharing are associated with the increase in private credit. However, they found no evidence of convergence of creditors' rights among the legal families. In addition, Nana (2014) found some contrary results to the previous literature (Djankov et al., 2007; Jappelli and Pagano, 2002) with no evidence of a substitution pattern between the legal system and the information sharing. Furthermore, Deakin et al. (2017) studied the effect of legal reforms on the amount of domestic credit by making a distinction between the creditor-friendliness and the debtor-friendliness of the reform. Their study points out that the reforms strengthening the creditors' control over the financial distressed firms have a positive and significant impact on the private credit, whereas the reforms increasing the secured creditors' rights over firms' assets have an opposite effect.

Finally, some studies underline the contrasting effect of producing new laws and granting new legal rights to creditors on the private credit provided by the banking system. In this sense, Haselmann et al. (2010) showed that the legal changes in countries whose banking systems are less developed increase the supply of credit as is the case of former socialist countries from Central and Eastern Europe. In addition, they confirmed that the variance of the lending volume of foreign banks is much higher than the credit supply variance of incumbent banks whenever the legal changes occur in the judicial system. Extending the rights of secured creditors may reduce the cultural and informational barriers to market entry for the foreign

banks. On a different note, Deaking et al. (2017) showed that the legal changes of the secured creditors' rights can significantly reduce the private credit in France, Germany, United Kingdom (U.K.), and Unites States (U.S.). One explanation of that result is that the new rights granted to the secured creditors may deter firms to provide collateral in their pursuit of obtaining financial funds.

Although most of the studies focused on the financial effects of the creditors' legal protection, the legal changes of the commercial code or the bankruptcy law cannot solely explain the evolution of the judicial system. Hence, we shall examine for the first time the financial relevance of the number of new laws that are more suitable for the assessment of the legal system evolution.

2.2 *Ex-post* impact of new laws on private credit

Two major mechanisms may explain how the enactment of new laws by national parliaments can affect the extension of the private credit. According to the natural selection view, rules that are not adapted to improve the quality of the laws tend to be replaced with more efficient rules (Fried 1980; Goodman 1980; Cooter and Kornhauser 1980). Such self-improvement mechanism prevails in the common law systems in which the legal culture encourages judges to create legal precedents that act as new laws (Watson, 1983). On a similar note, Gennaioli and Shleifer (2007) developed the Cardozo theorem. According to that theorem, the legal evolution allows to correct judicial deficiencies even when the judge-made legal rules are the results of some personal interests. Thus, it may be possible that the new laws enacted by the national parliaments are also subject to a natural selection mechanism. By acting in the best interest of the citizens, legislators may replace the inefficient laws with newly created laws. If the new laws are perceived as a signal of judicial improvement, the banks may be more confident in the economic growth perspective of the national economy. *Consequently, the domestic credit should increase following the adoption of more new laws.*

The second one deals with the mechanism of default risk. Debtors either physical persons or firms may have difficulties in adapting their financial strategies to an important amount of new laws, i.e. severe changes of the legal environment. For instance, Stef (2018) showed that the number of corporate bankruptcies tends to significantly increase following the adoption of more legal firing restrictions. The adaptation of firms to an intense legal change may be costly if firms have to employ legal advisors. Those difficulties of adapting to new laws may diminish their debt repayment capacity. Consequently, banks may be exposed to a high

risk of low debt recovery in case of debtor's default. *Thus, the banks' incentives to extend the credit supply should diminish following the enactment of more new laws.*

3. Data

3.1 Variables

Data on private credit were gathered from the International Monetary Fund and the World Bank. The C*redit by banks* variable corresponds to the value of domestic credit provided by banks to the private sector in % of the gross domestic product (*GDP*). Alternatively, the *Credit by financial sector* variable includes the amount of credit provided to the private sector by other financial intermediaries such as monetary authorities and other financial corporations.

Our legal variable *New laws* consists of the annual number of new laws or acts passed by the national parliaments of 33 developed and developing countries from 2003 to 2016. Data on the number of new laws were either provided by specialists of the national ministry of justice or were manually collected from the relevant source of the country as detailed in the appendix. We classified a country as a developed country if its average value of *GDP* per capita was higher than the median value of the sample. Otherwise, the country was classified as a developing country. Table 2 shows that the group of the developing countries (21 countries) passed on average 30 more new laws per year compared to the group of the developed countries (12 countries) over the period. The gap between developing and developed countries tends to be relatively stable over the period despite its reduction that started in 2012.

Furthermore, we include three types of control variables. Macroeconomic control variables consist of the *GDP per capita*, the *Growth rate*, the *Inflation*, and the *Population density* at the country level that are retrieved from the World Bank. Legal rights and credit information sharing control variables contain the *Private bureau*, the *Public registry*, and the *Rule of law* and come either from Doing Business or the World Bank. Finally, the banking industry control variables include *Bank costs* as banks' overhead costs to total assets at the country level, *Provisions* as the median value of provisions to non-performing loans ratio at the country level, and *Regulatory capital* as the median value of regulatory capital to risk-weighted assets ratio at the country level. Detailed definitions of those variables and their sources are presented in table 1.

{Table 1 near here}

{Table 2 near here}

3.2 Summary statistics

Table 3 provides some summary statistics of our panel data set composed of 33 countries for the 2003-2016 period. The descriptive statistics of our variables are presented for the full sample, for the group of the developed countries and for the group of the developing countries. Table 3 shows that the amount of private credit provided by banks represents on average 38.4% of the *GDP* of the developing countries that is almost one third of the average percentage recorded in the case of the developed countries. A similar ratio between the two groups can also be noticed in the case of *Credit by financial sector*.

In terms of legal dynamics, we observe that the developed countries tend to enact or promulgate more new laws than the developing countries (an average of 135 new laws per year for the developed countries against 105 new laws per year for the developing countries). The median values of those groups confirm that the two groups have different legal inflations. More than half of the developing countries enact on average more than 89 new laws per year compared to 50 new laws per year in the case of the other group of countries.

Table 3 also statistically describes the number of calendar days required to enforce a contract. An average period of 449 days is required to enforce a contract in the developed countries compared to 684 days in the developing countries. That difference suggests that the two groups have different institutional environments that is confirmed by the statistics of *Rule of law*. Not surprisingly, the developing countries have on average more efficient institutions than the developed countries. Finally, some descriptive statistics are also provided for the banking industry. We shall note that the banks from the developed countries present lower costs than banks from the developing countries. Those costs represent on average 1.39% of the total assets for the developed countries against 3.94% for the developing countries, showing a more rigorous management and control by banks in the developed countries. That safer management is also confirmed by the level of provisions. For the group of the developed countries, the amount of provisions represents on average 58.4% of the nonperforming loans compared to 87.48% for the developing countries. The economic environment of the last group seems to be associated with a higher level of risk that is also statistically confirmed by the level of regulatory capital. Those capital requirements are higher in the developing countries than in the environment of the developed countries. The *t*-statistics of the *t*-test of means between the two groups are also provided by table 3. With the exception of the distribution of public registries (*Private registry*), the two subsamples are statistically different in terms of financial development, legal dynamics, institutional environment and banking characteristics. The use of

the development criterion seems to be justified by the significant differences between our groups.

<center>{Table 3 near here}</center>

Furthermore, table 4 shows the correlation matrix of our variables. Several elements can be pointed out from that table. Firstly, the number of new laws seems to be negatively correlated with the supply of credit provided by the banks but also by the financial sector that includes leasing companies, money lenders, insurance corporations, pension funds and foreign exchange companies. Secondly, our data provide the first clues that the financial industry is sensitive to the quality of the institutions. *Rule of law* is positively correlated with the bank's credit offer either measured by *Credit by banks* or by *Credit by financial sector*. Thirdly, the credit supply is negatively correlated with our three variables describing the structure of the banking system such as bank costs, provisions and regulatory capital. The banking costs should significantly reduce the credit supply of the banks and the financial sector. Hence, the cost-efficiency is a key factor that should be included in the analysis of the private credit. In addition, we can notice that *Regulatory capital* has the lowest correlation coefficient in absolute value among the three banking variables. The lending policy seems to be less sensitive to those regulations albeit banks have to conserve capital, i.e. capital conservation buffer, to cope with the debtors' risk.

<center>{Table 4 near here}</center>

4. Estimations

This section presents our estimations of the *ex-post* impact of the number of new laws on the amount of private credit provided by the banks. Furthermore, we include some robustness tests dealing mainly with the quality of public institutions and the financial characteristics of the banking system. The last part of this section describes the main caveats of our empirical approach.

4.1 New laws and the private credit provided by banks

We shall examine that relationship using the following regression model:

$$Credit\ by\ banks_{i,t} = \phi New\ laws_{i,t-1} + \beta Control\ variables_{i,t-1} + \lambda_i + \varphi_t + \mu_{i,t} \qquad (1)$$

where i is the index of the country that ranges from 1 to 33, t is the index of the year that ranges from 2003 to 2016, λ_i and φ_t capture the unobserved country effects and time effects whereas $\mu_{i,t}$ is the error term. Our dependent variable will be *Credit by banks*. The vector *Control variables* includes a set of variables that allow to control for the economic environment (the

logarithm of *GDP per capita*, *Growth rate* and *Inflation*), for the geographic distribution of the population (*Population density*), for the financial transparence of the debtors (*Private bureau* and *Public registry*) and for the enforcement of credit contracts (logarithm of *Contract enforcement*). That vector is lagged by 1-year given that banks usually adapt their credit supply according to their expectations that depend on the previous economic conditions of the country. Following the studies of Djankov et al. (2007) and Nana (2014), the sharing of credit information (*Private bureau* and *Public registry*) and the quality of law enforcement (*Contract enforcement*) are significant determinants of the private credit. On the one hand, the credit supply tends to significantly grow if more information about the credit history of debtors is shared with the lenders either by public institutions or by private agencies. On the other hand, legal systems that slow down the enforcement of a credit contract reduce the lenders' incentives to extend the credit. Furthermore, we expect the geographic density of the population (*Population density*) to encourage the growth of the private credit through a higher financial demand for credit consumption. Overall, our set of control variables is similar to the one initially used by Djankov et al. (2007) that studied the determinants of the private credit for a sample of 129 countries during 1978 and 2003.

The coefficients of equation (1) are estimated by a panel regression with fixed-time effects and robust standard errors. Table 5 presents those estimations for the full sample of countries (column (1)), the subsample of developed countries (column (2)) and the subsample of developing countries (column (3)). We can notice that the number of new laws adopted in the previous year significantly diminishes the credit supply of banks in the case of the full sample (column (1)). However, the significant impact of *New laws* lagged by 1-year on *Credit by banks* is confirmed only for the subsample of developed countries (column (2)). The preliminary estimations confirm that the banking credit policies are sensitive to major changes of the legal system. A strong legal dynamics significantly hampers the growth of the private credit. Banks' decisions to extend lending seem to benefit more from the legal stability. As the quality of the legal systems in the developed countries tends to be already high (table 3), new laws may qualify as legal inflation. In terms of the control variables, the difficulty of enforcing a contract (*Contract enforcement*) reduces the amount of private credit only for the subsample of developing countries. A longer delay of the contract enforcement increases the risk of low debt recovery that the banks have to incur. In addition, the coefficient of *Population Density* is positive and significant at 1% level only in the first column. Demographic changes may encourage banks to extend the private credit. However, that significant impact is not robust

when we differentiate the countries according to the development criterion. Furthermore, we shall test the robustness of the estimates in the following subsection.

{Table 5 near here}

4.2 Robustness checks

The amount of new laws has shown to be a significant determinant mainly for the group of developed countries. We will assess the robustness of that result using three approaches. First, we will consider another dependent variable in the equation (1). Second, we will include the quality of public institutions in the econometric approach. Third, we will expand the number of the control variables with different covariates related to the structure of the banking system.

4.2.1 New laws and the financial sector

One may argue that the banking system is not the only credit supplier. Other monetary authorities or financial corporations may also contribute to the domestic credit. In this sense, the IMF (International Monetary Fund) gathered data on the ratio between the domestic credit provided by the financial sector and the national *GDP*. We shall introduce *Credit by financial sector* as our dependent variable and re-estimate the coefficients of the equation (1) using the same econometric approach. The results are reported in table 6. The *F*-statistic of the *F*-test confirms that the addition of *New laws* lagged by 1-year significantly improved the explanatory power of the model only for the subsample of developed countries. Consequently, the financial sector of those countries perceives the intense legal changes as a negative signal of the debtors' financial ability to reimburse a debt. The debtors' adaptation to a new legal system emerged from the enactment of new laws may be costly. As a result, in the developed countries, the legal inflation is associated with less credit. However, the dynamics of the legal environment has no significant influence on the domestic credit provided by the financial sectors in the developing countries. Compared to table 5, *Inflation* shows now a negative and significant coefficient in column (2). That result is consistent with the results reported by Djankov et al. (2007) and Nana (2014).

{Table 6 near here}

4.2.2 Importance of public institutions

As shown in table 3, the two groups of countries are statistically different in terms of the quality of contract enforcement and the property rights (*Rule of law*). The impact of the new laws on the banking system may depend on the efficiency of public institutions to impose *ad*

litteram the new regulations. If the quality of public institutions is high, debtors may tend to prefer the stability of legal rules as it is costly for firms to adapt to the new legal changes. However, more efficient new laws associated with a poor quality of public institutions may encourage banks to extend lending following the improvement of the reimbursement capacity of debtors. The lending policy of banks may be based on a certain trade-off between the stability of laws and the quality of public institutions.

Hence, we shall introduce in equation (1) the interaction term between *New laws* and *Rule of law*, i.e. the product between the two variables. The estimations explaining *Credit by banks* are presented in table 7. The interaction term and its main terms are lagged by 1-year. Table 7 points out that the coefficient of the interaction term is negative and significant in the column related to the group of developed countries. Following the suggestions of Braumoeller (2004) on how to interpret the coefficients of an interaction term and its main terms, we can argue that a joint increase of the number of new laws and the efficiency of the public institutions significantly decreases the private credit in the developed countries. When the quality of the public institutions is high, the credit growth does not benefit from more new laws. It is very likely that in the developed countries characterized by a high level of confidence in the public institutions (*Rule of law*), a large amount of new laws represents a negative shock to the financial stability of economic agents that intend to borrow. Economic agents would therefore tend to value more the legal stability. Furthermore, the coefficient of *New laws* lagged by 1-year (column (2)) is positive and significant. According to Braumoeller (2004), the coefficient of the main term describes its impact on the dependent variable when the value of the other main term is equal to 0. In our case, an increase of the number of new laws enacted in the previous year favors the growth of *Credit by banks* in countries for which *Rule of law* is nil, i.e. the quality of public institutions is moderate. When the initial quality of public institutions is moderate, economic agents may expect the new laws to improve the efficiency of public institutions. On a different note, the column (3) reports a positive coefficient of *New laws* but non-significant for the developing countries. New regulations may have the purpose to foster the economic development, to improve the quality of public services and to modernize the legal systems of the developing countries. Surprisingly, those countries seem not to benefit from more new laws whenever their public institutions have a moderate efficiency.

{Table 7 near here}

4.2.3 Features of banking sector

The banking systems are not homogeneous as they differ in terms of cost efficiency, their ability to cover the nonperforming loans and the capital requirement. Our initial regression does not control for none of those financial aspects. Consequently, we decided to add three new variables in order to better control for the features of the banking sector. The first variable deals with the ratio between the overhead costs of a bank and its assets aggregated at the national level (*Bank costs*). The second variable represents the median value of the ratio between the amount of bank's provisions and its nonperforming loans (*Provisions*). The last variable measures the percentage of the regulatory capital in the risk-weighted assets of the median bank (*Regulatory capital*). In addition, all the three financial features are statistically different between the two groups of countries (table 3). The banks from the developing countries tend to have on average higher banking costs, larger provisions and higher levels of regulatory capital.

Table 8 presents the estimated coefficients after the addition of those variables. The coefficient of *New laws* lagged by 1-year remains robust for the subsample of developed countries (column (1)). However, in the case of the developing countries, the changes in the legal environment do not provide significant incentives for the banks to modify the credit supply. Moreover, higher banking costs (*Bank costs*) significantly reduce the amount of the private credit mainly in the economic environment of the developed countries. In addition, the amount of banking provisions (*Provisions*) and the amount of regulated capital required to cover the risk-weighted assets (*Regulatory capital*) seem to play an essential role for the banking policy to extend the credit in the developing countries.

{Table 8 near here}

4.3 Caveats

The research methodology has four major limits. First, the variable *New laws* measures only the number of new acts enacted by the parliaments without considering the aim of the law. A distinction of the new laws according to the judicial field, e.g. financial, social, environmental, educational, would be suitable to better understand the financial consequences of legal dynamics. Second, our analysis neglects the content of the new laws. Although we controlled for the quality of public institutions, the efficiency of the legal design is not assessed by our variables. One solution would be to construct questionnaires for different attorneys that could be used to assess the quality of the new laws. Third, the available data on the private credit provided either by the banking system or the financial system group all the banks in the same pool. However, the commercial banks may be more exposed to the risks encompassed by

the new laws than the investment banks. A more detailed dependent variable can allow to determine if the influence of the new laws is similar across the different types of banks. Fourth, our sample is based only on the judicial lawmaking process of the national parliament. In the common law countries, new laws can be made by judges or appellate courts that decide on certain cases and create judicial precedents (Gennaioli and Shleifer, 2007). A step further of our research would be to identify other sources of legal changes.

5. Discussions and conclusion

Bank's credit policy cannot only be analyzed through the monetary policy defined by the central bank, but also through institutional parameters, such as the quality of public institutions and the efficiency of the legal framework. Our paper provides a theoretical framework that can be used to understand how the lending activity is explained by non-monetary aspects. This study confirms that the number of new laws financially matters. In this sense, we empirically assess the *ex-post* financial impact of new laws on the lending operations of the banking system. Moreover, we propose two theoretical arguments that may explain the financial relevance of new laws for the private credit. First, the law-making process can lead to the adoption of more efficient new laws and thus encouraging the credit extension (*argument of judicial selection*). Second, more new laws may hamper the growth of the domestic credit by diminishing the adaptability of private agents to severe legal changes (*argument of default risk*).

The estimates support the second argument but only in the case of the developed countries. An increase of the number of new laws enacted by the parliaments of developed countries significantly decreases the private credit to *GDP* in the following year of the legal change. From an institutional and political perspective, the enactment of new laws or the legal inflation also encourages the extension of credit only in the developed countries that have public institutions with moderate efficiency. In the presence of high quality public institutions, debt holders tend to prefer more the stability of the legal framework given that severe legal changes can lead to an increase of the transaction costs and enhance the economic and financial uncertainties. Surprisingly, the growth of the private credit provided by banks does not benefit from the enactment of more new laws in the developing countries. Those banks probably anticipate the need of the developing countries to change the legal system through the adoption of new laws. However, the credit supply in those countries is mainly determined by the capital requirements, the amount of provisions for the nonperforming loans and the enforcement period of the contracts.

Overall, this research opens the door for new extensions that may shed light on the financial importance of legal dynamics. For instance, classifying the new laws according to their judicial field, i.e. financial, social, institutional, etc., or assessing the average quality of new laws by local attorneys are some interesting paths that our study should follow.

Acknowledgements

References

Cooter, R., & Kornhauser, L. (1980). Can litigation improve the law without the help of judges?. The Journal of Legal Studies, 9(1), pp. 139-163.

Cuervo-Cazurra, A. (2008). The multinationalization of developing country MNEs: The case of multilatinas. Journal of International Management, 14(2), pp. 138-154.

Deakin, Mollica, Sarkar, (2017), Varieties of creditor protection: insolvency law reform and credit expansion in developped market economies, Socio Economic Review, 15(2), pp. 359-384.

Diamond, Douglas; Dybvig, Philip H. (1983), Bank Runs, Deposit Insurance, and Liquidity, Journal of Political Economy, 91(3), pp. 401-419.

Diamond, Douglas; Rajan, Raghuram (2001), Liquidity Risk, Liquidity Creation, and Financial Fragility: A Theory of Banking, Journal of Political Economy, 109(2), pp. 287-327.

Djankov, S., McLiesh, C., & Shleifer, A. (2007). Private credit in 129 countries. Journal of financial Economics, 84(2), pp. 299-329.

Finlay, F. (2008). The management of consumer credit, Palgrave Macmillan, London.

Fried, C. (1980). The laws of change: the cunning of reason in moral and legal history. The Journal of Legal Studies, 9(2), pp. 335-353.

Gennaioli, N., & Shleifer, A. (2007). The evolution of common law. Journal of Political Economy, 115(1), pp. 43-68.

Goodfriend, M. (2014). Lessons from a century of FED policy: Why monetary and credit policies need rules and boundaries. Journal of Economic Dynamics & Control, 49, pp. 112–120.

Goodman, J. C. (1978). An economic theory of the evolution of common law. The Journal of Legal Studies, 7(2), pp. 393-406.

Haselmann, R., Pistor, K., & Vig, V. (2009). How law affects lending. The Review of Financial Studies, 23(2), pp. 549-580.

Jude, C. & Levieuge, G. (2017). Growth Effect of Foreign Direct Investment in Developing Economies: The Role of Institutional Quality, The World Economy, 40(4), pp. 715-742.

La Porta, R., Lopez-de-Silanes, F., & Shleifer, A. (2008). The Economic Consequences of Legal Origins, Journal of Economic Literature, 46(2), pp. 285-332.

La Porta, R., Lopez-de-Silanes, F., Shleifer, A., & Vishny, R. W. (1997). Legal determinants of external finance. The Journal of Finance, 52(3), pp. 1131-1150.

Nana P. V. N. (2014). Legal Rights, Information Sharing, and Private Credit: New Cross-Country Evidence, Quarterly Review of Economics and Finance, 54, pp. 315-323.

North, D. C. (1990). Institutions, Institutional Change and Economic Performance, Cambridge University Press, New York.

North, D.C. (1991). Institutions, Journal of Economic Perspectives, 5(1), pp. 97-112.

Orzechowski, P. (2017). Bank capital, loan activity, and monetary policy: evidence from the FDIC's Historical Statistics on Banking. Journal of Economics & Finance, 41(2), pp. 392–407.

Stef, N. (2018). Bankruptcy and the difficulty of firing. International Review of Law and Economics, 54, pp. 85-94.

Teece, D. J. (1986). Transaction cost economics and the multinational enterprise. An assessment, Journal of Economic Behavior & Organization, 7(1), pp. 21-45.

Watson, A. (1983). Legal change: sources of law and legal culture. University of Pennsylvania Law Review, 131(5), pp. 1121-1157.

Webb, D. C. (2000). The impact of liquidity constraints on bank lending policy. The Economic Journal, 110(460), pp. 69-91.

Williamson, O.E. (1985). The economic institutions of capitalism. Firms, markets, relational contracting, The Free Press, New York.

Williamson, O.E. (2000). The new institutional economics: taking stock, looking ahead. Journal of Economic Literature, 38(3), pp. 595-613.

Table 1. Definition of variables

Variable	Definition and source
Credit by banks	The ratio between the domestic credit provided by banks to the private sector and the country's *GDP*. The domestic credit includes the financial resources provided to the private sector by other depository corporations, such as through loans, purchases of nonequity securities, and trade credits and other accounts receivable, that establish a claim for repayment. The credit provided by central banks is not considered. Source: International Monetary Fund and the World Bank.
Credit by financial sector	Ratio between the domestic credit provided by the financial sector and the country's *GDP*. The domestic credit does not include the credit to the central government. The financial sector includes monetary authorities, deposit money banks and other financial corporations where data are available such as finance and leasing companies, money lenders, insurance corporations, pension funds, and foreign exchange companies. Source: International Monetary Fund and the World Bank.
New laws	The annual number of new laws or acts passed by the national parliament. The variables does not consider the decrees, the orders and the ordinances.
GDP per capita	The ratio between the gross domestic product in constant U.S. dollars and the midyear population. Source: World Bank.
Growth rate	The annual percentage growth rate of GDP at market prices based on constant local currency. Source: World Bank.
Inflation	The ratio between GDP in current local currency and the GDP in constant local currency. Source: World Bank.
Population density	The ratio between the midyear population and the land area in square kilometers Source: World Bank.
Contract enforcement	The number of calendar days required to enforce a contract. Source: World Bank, Doing Business Project.
Private bureau	The ratio between the total number of individuals and firms listed by a private credit bureau and the adult population of the country.

	A private credit bureau is a nonprofit organization or a private firm provide information on their repayment history, credit outstanding and unpaid debts from the past 5 years The coverage value is 0 if no private bureau operates in the country. Source: World Bank, Doing Business Project.
Public registry	The ratio between the total number of individuals and firms listed by a public credit registry and the adult population of the country. A public registry represents a national database managed by the public authorities that provides information on the repayment history of debtors, their credit outstanding and unpaid debts from the past 5 years The variable is equal to 0 if no public credit registry operates in the country. Source: World Bank, Doing Business Project.
Rule of law	The level of agents' confidence in the quality of contract enforcement, the property rights, the police, the courts and the likelihood of crime and violence. The index range from -2.5 to 2.5. Source: World Bank.
Bank costs	The bank's overhead cost to total assets. Data are aggregated on the country level before the division of the two variables. Source: Bankscope, Bureau van Dijk (BvD).
Provisions	The median value at national level determined as the ratio between the bank's provisions and its nonperforming loans. Source: Financial Soundness Indicators Database, International Monetary Fund (IMF).
Regulatory capital	The bank regulatory capital to risk-weighted assets represents the median value at national level computed as the ratio of total regulatory capital to the bank's assets. Source: Financial Soundness Indicators Database, International Monetary Fund (IMF).

Table 2. Average values of the number of new laws per year and per country group

Variable	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	Total
Full Sample	121.9	133.3	119.0	113.6	119.5	110.1	114.3	108.4	109.2	110.5	118.1	119.3	114.6	111.5	116.0
Developed countries	106.5	119.3	106.0	97.6	106.6	96.0	91.1	96.8	97.2	107.7	108.1	123.5	103.4	111.4	105.1
Developing countries	148.8	157.8	141.7	141.6	142.2	134.8	154.8	128.8	130.2	115.3	135.5	112.0	134.3	111.7	135.0

Table 3. Descriptive statistics

Independent Variables	Full sample		Developed countries		Developing countries		T-test
	Average	Median	Average	Median	Average	Median	
Credit by banks (%)	82.366	80.808	107.473	103.308	38.430	37.317	1.965***
Credit by financial sector (%)	122.928	122.283	156.923	150.864	63.438	51.654	1.964***
New laws	115.955	61.500	105.099	49.500	134.952	89.500	1.967**
GDP per capita ($)	29713.344	29571.704	42661.339	41785.557	7054.354	6981.518	1.966***
Growth Rate (%)	2.542	2.395	1.890	1.899	3.683	3.916	1.967***
Inflation (%)	3.800	2.267	1.607	1.624	7.637	6.185	1.972***
Population density	351.281	110.711	495.798	130.170	98.377	65.633	1.967***
Contract enforcement (days)	534.137	500.000	448.680	397.000	683.685	600.000	1.969***
Private bureau	56.234	61.200	60.261	74.900	49.185	53.550	1.967***
Public registry	12.705	0.000	12.412	0.000	13.219	0.100	1.966
Rule of law	0.983	1.168	1.540	1.664	0.010	0.026	1.967***
Bank costs (%)	2.311	1.758	1.390	1.178	3.941	3.655	1.971***
Provisions (%)	69.199	57.300	58.401	50.300	87.479	68.650	1.968***
Regulatory capital (%)	14.574	14.224	14.207	13.408	15.248	15.035	1.966***

Notes: The sample of developed countries is composed of 21 countries such as Australia, Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Ireland, Italy, Japan, Netherlands, Norway, Portugal, Singapore, South Korea, Spain, Sweden, Switzerland, United Kingdom and United States. The sample of developing countries includes 12 countries such as Argentina, Brazil, Bulgaria, Hungary, India, Mexico, Namibia, Pakistan, Poland, Romania, South Africa and Uruguay. *t*-statistics of the *t*-tests of means between the sample of developed countries and the sample of the developing countries are provided in the last column of the table. * implies a significant difference at 10% level, ** at 5% level and *** at 1% level.

Table 4. Correlation matrix

	Credit by banks	Credit by financial sector	New laws	GDP per capita	Growth rate	Inflation	Population density	Contract enforcement	Private bureau	Public registry
New laws	−0.180***	−0.197***								
	(0.000)	(0.000)								
GDP per capita	0.669***	0.608***	0.056							
	(0.000)	(0.000)	(0.227)							
Growth rate	−0.293***	−0.354***	−0.067	−0.332***						
	(0.000)	(0.000)	(0.147)	(0.000)						
Inflation	−0.501***	−0.476***	0.045	−0.496***	0.136***					
	(0.000)	(0.000)	(0.333)	(0.000)	(0.002)					
Population density	0.124***	−0.049	−0.271***	0.119***	0.154***	−0.126***				
	(0.006)	(0.272)	(0.000)	(0.008)	(0.001)	(0.005)				
Contract enforcement	−0.405***	−0.277***	0.162***	−0.579***	0.108**	0.288***	−0.469***			
	(0.000)	(0.000)	(0.000)	(0.000)	(0.021)	(0.000)	(0.000)			
Private bureau	0.013	0.149***	0.083*	0.305***	−0.031	0.023	−0.369	−0.149***		
	(0.796)	(0.002)	(0.084)	(0.000)	(0.526)	(0.642)	(0.446)	(0.002)		
Public registry	−0.034	−0.051	0.201***	−0.024	−0.191***	0.105**	−0.099**	0.216***	−0.335***	
	(0.477)	(0.289)	(0.000)	(0.624)	(0.000)	(0.030)	(0.039)	(0.000)	(0.000)	
Rule of law	0.719***	0.594***	−0.018	0.861***	−0.224***	−0.595***	0.157***	−0.570***	0.163***	−0.168***
	(0.000)	(0.000)	(0.687)	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.001)	(0.001)
Bank costs	−0.634***	−0.538***	0.258***	−0.577***	0.181***	0.598***	−0.190***	0.313***	0.036	0.021
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.458)	(0.672)
Provisions	−0.280***	−0.322***	0.080	−0.351***	0.130***	0.347***	−0.135***	0.024	−0.088*	0.121**
	(0.000)	(0.000)	(0.101)	(0.000)	(0.006)	(0.000)	(0.004)	(0.619)	(0.083)	(0.017)
Regulatory capital	−0.157***	−0.131***	0.133***	0.024	0.092**	0.030	0.094**	−0.099**	0.053	0.014
	(0.000)	(0.004)	(0.005)	(0.604)	(0.043)	(0.511)	(0.040)	(0.034)	(0.279)	(0.768)

Notes: Pearson's product-moment correlation coefficients are reported. *p*-value are in brackets. *** implies a significant correlation at 1% level, ** at 5% level and * at 10% level. A detailed description of the variables is presented in table 1.

Table 5. Private credit provided by banks and new laws

Independent Variables	Full sample (1)	Developed countries (2)	Developing countries (3)
New laws $_{t-1}$	−2.173**	−3.078**	−0.013
	(0.032)	(0.023)	(0.985)
Log (GDP per capita) $_{t-1}$	19.259**	52.187**	9.031
	(0.016)	(0.019)	(0.116)
Growth rate $_{t-1}$	−1.639**	−2.747***	−0.212
	(0.013)	(0.001)	(0.403)
Inflation $_{t-1}$	−0.317	−0.330	−0.064
	(0.168)	(0.652)	(0.513)
Population density $_{t-1}$	0.025***	0.012	−0.011
	(0.000)	(0.067)	(0.927)
Log (Contract enforcement) $_{t-1}$	−30.376	−23.522	−53.876***
	(0.161)	(0.298)	(0.000)
Private bureau $_{t-1}$	0.036	0.152	−0.019
	(0.665)	(0.408)	(0.824)
Public registry $_{t-1}$	−0.037	0.152	0.124
	(0.698)	(0.484)	(0.198)
Constant	82.223	−303.330	309.273***
	(0.528)	(0.198)	(0.000)
Observations	396	252	144
Time effects	Yes	Yes	Yes
Fixed effects	Yes	Yes	Yes
F-test	5.031**	6.267**	0.000
R²	0.381	0.475	0.527

Notes: Coefficients are estimated using a panel regression with fixed time effects and robust standard errors. The dependent variable is *Credit by banks*. The *p*-values are reported in brackets. * implies significance at 10% level, ** at 5% level and ***at 1% level.

Table 6. Private credit provided by the financial sector and new laws

Independent Variables	Full sample (1)	Developed countries (2)	Developing countries (3)
New laws $_{t-1}$	−3.412*	−4.763***	−0.762
	(0.069)	(0.010)	(0.486)
Log (GDP per capita) $_{t-1}$	−10.283	28.516	7.778
	(0.207)	(0.209)	(0.299)
Growth rate $_{t-1}$	−2.178**	−3.743***	−0.133
	(0.034)	(0.000)	(0.443)
Inflation $_{t-1}$	−0.518	−0.947*	−0.133
	(0.161)	(0.055)	(0.443)
Population density $_{t-1}$	0.026***	0.004	0.094
	(0.000)	(0.630)	(0.286)
Log (Contract enforcement) $_{t-1}$	−12.386	6.432	−63.892***
	(0.659)	(0.802)	(0.000)
Private bureau $_{t-1}$	0.019	0.388	−0.050
	(0.892)	(0.292)	(0.683)
Public registry $_{t-1}$	0.062	0.483	0.025
	(0.684)	(0.108)	(0.797)
Constant	322.510*	−176.011	−412.566***
	(0.068)	(0.514)	(0.001)
Observations	396	252	144
Time effects	Yes	Yes	Yes
Fixed effects	Yes	Yes	Yes
F-test	3.538*	8.103***	0.520
R²	0.436	0.590	0.508

Notes: Coefficients are estimated using a panel regression with fixed time effects and robust standard errors. The dependent variable is *Credit by financial sector*. The *p*-values are reported in brackets. * implies significance at 10% level, ** at 5% level and ***at 1% level.

Table 7. Private credit provided by the banks, quality of public institutions and new laws

Independent Variables	Full sample (1)	Developed countries (2)	Developing countries (3)
New laws $_{t-1}$	0.373	10.929**	0.149
	(0.798)	(0.041)	(0.863)
Rule of law $_{t-1}$	29.894***	68.047**	–7.675
	(0.006)	(0.018)	(0.451)
New laws $_{t-1}$ * Rule of law $_{t-1}$	–2.765**	–9.429**	2.725
	(0.035)	(0.017)	(0.330)
Log (GDP per capita) $_{t-1}$	17.221**	48.746**	7.959
	(0.031)	(0.022)	(0.168)
Growth rate $_{t-1}$	–1.588***	–2.602***	–0.264
	(0.009)	(0.000)	(0.306)
Inflation $_{t-1}$	–0.285	–0.321	–0.029
	(0.199)	(0.608)	(0.832)
Population density $_{t-1}$	0.023***	0.008	0.007
	(0.000)	(0.188)	(0.953)
Log (Contract enforcement) $_{t-1}$	–27.436	–21.090	–48.272***
	(0.204)	(0.333)	(0.003)
Private bureau $_{t-1}$	0.047	0.180	–0.014
	(0.557)	(0.391)	(0.864)
Public registry $_{t-1}$	–0.009	0.204	0.124
	(0.927)	(0.404)	(0.186)
Constant	54.547	–386.738	278.469***
	(0.674)	(0.100)	(0.005)
Observations	396	252	144
Time effects	Yes	Yes	Yes
Fixed effects	Yes	Yes	Yes
F-test	6.833***	5.277***	0.409
R^2	0.407	0.512	0.540

Notes: The dependent variable is *Credit by banks*. The *p*-values are reported in brackets. * implies significance at 10% level, ** at 5% level and ***at 1% level. F-test reports the F-statistic following the addition of the interaction terms and its main terms.

Table 8. Private credit provided by the banks, features of banking sector and new laws

Independent Variables	Full sample (1)	Developed countries (2)	Developing countries (3)
New laws $_{t-1}$	−1.944*	−2.823**	−0.029
	(0.060)	(0.048)	(0.966)
Bank costs $_{t-1}$	−2.674**	−4.943***	−1.324
	(0.019)	(0.009)	(0.104)
Provisions $_{t-1}$	−0.025	−0.015	−0.075**
	(0.327)	(0.621)	(0.014)
Regulatory capital $_{t-1}$	−0.967	−0.754	−1.258*
	(0.140)	(0.405)	(0.052)
Log (GDP per capita) $_{t-1}$	19.421**	47.688**	10.289**
	(0.016)	(0.026)	(0.043)
Growth rate $_{t-1}$	−1.286***	−2.061***	−0.207
	(0.009)	(0.002)	(0.451)
Inflation $_{t-1}$	−0.416**	−0.244	−0.167
	(0.029)	(0.732)	(0.238)
Population density $_{t-1}$	0.0230***	0.020***	−0.026
	(0.000)	(0.003)	(0.757)
Log(Contract enforcement) $_{t-1}$	−53.690***	−52.915***	−40.629***
	(0.001)	(0.333)	(0.001)
Private bureau $_{t-1}$	0.039	0.124	0.005
	(0.560)	(0.479)	(0.937)
Public registry $_{t-1}$	−0.023	0.116	0.065
	(0.814)	(0.590)	(0.404)
Constant	244.054**	−63.127	246.835***
	(0.046)	(0.795)	(0.006)
Observations	361	226	135
Time effects	Yes	Yes	Yes
Fixed effects	Yes	Yes	Yes
F-test	3.319**	3.085**	3.916**
R²	0.514	0.578	0.673

Notes: The dependent variable is *Credit by banks*. The *p*-values are reported in brackets. * implies significance at 10% level, ** at 5% level and ***at 1% level. F-test reports the F-statistic following the addition of *New laws $_{t-1}$*, *Bank costs $_{t-1}$*, *Provisions $_{t-1}$* and *Regulatory capital $_{t-1}$*.

Appendix

Country	Source
Argentina	Ministerio de Justicia y Derechos Humanos
Australia	Parliament of Australia
Austria	Parliament of Austria, Specialist : Daniel Nourani
Belgium	Belgium.be, SPF (Service Public Fédéral) Justice
Brazil	Assembleia Legislativa
Bulgaria	Clerk Services Department at the National Assembly
Czech Republic	Zakony pro lidi
Danemark	Retsinformation.dk
Finland	Finlex
France	Legifrance
Germany	Statista
Hungary	Wolters Kluwer
India	Law Commision of India
Ireland	Irish Statute Book
Italy	Normattiva
Japan	Ministry of Justice of Japan; Institute of Comparative Law, Waseda University
Mexico	Unidad General de Asuntos Juridicos
Namibia	Parliament of the Republic of Namibia
Netherlands	Overheid.nl
Norway	Government.no
Pakistan	Punjab Laws Online
Poland	Sejm Rzeczypospolitej Polskiej, Specialist: Jakub Majewski
Portugal	Parliament of Portugal
Romania	Ministerul Justitiei (Portal Legislativ)
Singapore	Singapore Statutes Online
South Africa	Parliament of the Republic of South Africa; Acts Online
South Korea	Ministry of Government Legislation
Spain	Congreso de Los Diputados
Sweden	Sveriges Riksdag
Switzerland	L'Assemblée fédérale - Le Parlement Suisse, Specialist: Claudia Indira D'Souza
United Kingdom	Parliament of United Kingdom
Uruguay	Parliament of Uruguay
United States	GovTrack.us