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HOW REGULATION AFFECTS THE RELEVANCE OF BANK-DEBT MATURITY AS A CONTROL MECHANISM IN DEVELOPED COUNTRIES

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Abstract. Improvements in transparency at the country level have modified the relevance of bank debt maturity as a control mechanism. The novelty of this research is that we provide empirical evidence that the maturity of bank borrowing is contingent on the characteristics of the regulatory and the institutional setting about corporate governance. The main implication of our paper is that corporate governance rules have greater influence in civil-law countries than in common-law countries in promoting efficiency in the use of bank debt maturity. The value of this paper is that our results confirm that the implementation of similar regulations on transparency across countries with different legal systems favors the alignment of the role played by short-term bank debt in addressing asymmetric information, agency costs, and inefficient liquidation.

Keywords: bank debt maturity, transparency, corporate governance, regulation, financial system, panel data.

JEL Classification: G32.

Introduction

The proportion and maturity of bank debt is a function of asymmetric information, agency costs, inefficient liquidation problems, and institutional setting (Antoniou *et al.* 2006). However, there is little evidence on the influence that changes in corporate governance regulation have on the use of debt maturity, particularly bank debt, as a corporate governance mechanism. Bank debt requires lower cost to inform financial markets and it gives managers more flexibility than public debt. Ge *et al.* (2012) find that corporate governance quality and legal framework condition bank financing. Then, our paper presents evidence that the implementation of legislation, hard law, which

promotes transparency in countries with different legal systems, aligns the role of bank debt maturity in addressing asymmetric information and agency problems. In addition to this, according to our understanding, this is the first study in treating the application of new regulation on corporate governance in different institutional environments as an explanatory variable in determining the maturity of bank debt contracts across countries. Differently than ours, other papers have focused on diverse aspects of regulation on the firm's financial decisions such as the role of law on corporate self-dealing, the effects of banking liberalization and the adoption of codes of good governance on capital structure (Djankov *et al.* 2008; Aguilera, Cuervo-Cazurra 2009; González 2015, among others). Nevertheless, our paper goes one-step forward in the intuition that changes in the corporate governance laws might influence the maturity in the design of bank debt contracts, and through this, the conduct of managers.

The major contributions of this paper are, first, that we develop a one-period lagged model that takes into account the adjustment process to optimal bank debt maturity to analyze how both the institutional contexts and the subsequent legal reforms on corporate governance, impact on the use of bank debt maturity as a control mechanism of public firms. Neither Fan *et al.* (2012) nor Qian and Strahan (2007) consider the dynamic nature of debt maturity. Second, we present empirical evidence that the benefits of the implementation and enforcement of regulation on transparency are more relevant in civil- than in common-law countries. Fan *et al.* (2012) use indexes to measure corruption or bankruptcy law differences whereas our study takes advantage of the implementation of comparable legislations in countries with different legal systems. Third, we test how the most relevant regulations on transparency have aligned the role of short-term bank debt in financing growth opportunities in common- and civil-law countries. Fourth, we build upon the previous literature on the relationship between both the need for external funds and the ownership structure, and the bank debt maturity by studying how the institutional setting and the advances in corporate governance law condition such relationship. Fifth, the empirical analysis confirms the theoretical model on how public enforcement of contract law changes the role of ownership structure and external finance as determinants of debt maturity and extends such model to bank debt maturity.

We organize this paper in four sections and conclusions. After the introduction, the first section develops the literature review and the hypotheses. The second section depicts the sample used in the empirical analysis. The third section explains the method. Section four presents the main results. The final section summarizes the conclusions.

1. Literature review and hypotheses

The determinants of bank debt maturity might be examined in the context of agency theory, contracting costs, signaling hypothesis, and the law and finance literature. From these approaches, we propose our hypotheses, interacting regulation with growth opportunities, need of external funds, and ownership structure as drivers of bank debt maturity.

Corporate financial decisions may critically rely on the legal framework and the quality of legal enforcement (La Porta *et al.* 1998; Demirgüç-Kunt, Maksimovic 1999; Fan

et al. 2012). In particular, companies will adjust bank debt maturity to their needs but conditioned by asymmetric information considerations, agency problems and regulation and institutional limitations (Demirgüç-Kunt, Maksimovic 1999). The results of Antoniou *et al.* (2006, 2008), Kirch and Soares (2012) or Öztekin (2015) support the hypothesis that the quality of national institutions is an important determinant of corporate financing in general and of debt maturity in particular. Furthermore, the aim of regulation is to design institutional regulatory features that would contribute to lessen agency costs. Therefore, the analysis of bank-debt maturity may not be dissociated from regulation and institutional context. So, we add to this literature an analysis of bank debt maturity adjustment in the face of the implementation of the most relevant regulation, hard laws, on corporate governance for a sample of developed countries.

The firms' future growth options involve agency problems between bondholders and shareholders (González 2013, 2015), asymmetries of information (Goyal *et al.* 2002), and higher derived bankruptcy costs (Shleifer, Vishny 1992). Bank borrowing, and particularly short-term bank debt, reduces these problems (Flannery 1986). This argument is also supported by the role played by financial intermediaries in each institutional framework. As Grossman and Hart (1982) argue, firms with valuable proprietary information will prefer bank debt to public debt and, particularly, short-term bank debt in order to solve for the agency problems caused by the future growth opportunities.

Qian and Strahan (2007) and Bae and Goyal (2009) observe that stronger creditor protection reduces the cost of borrowing and increases the maturity of bank loans. Ge *et al.* (2012) argue that the effect of firm-level governance on bank debt contracting is asymmetric, depending on how well the investors' rights are protected. Typicaly, the investors' rights in market-oriented countries are better protected than in bank-based countries as a result of stronger law enforcement. Consequently, when the introduction of regulation improves the firm-level governance systems and their transparency, firms will adjust their capital structures in using less short-term bank debt as a governance devise to solve the agency problems caused by growth opportunities. Then, since such adjustment is contingent on the institutional environment, banks offer longer-maturity loans with fewer restrictive covenants and lower interest rates to firms in countries with better regulatory systems (Ge *et al.* 2012).

Based on these arguments, we should observe a shorter bank-debt maturity in civil-law countries than in common-law countries when financing future growth opportunities as a consequence of the differences in the quality of the institutions and the legal system in both contexts. Similarly, if the new regulation on corporate governance is effective, we should observe greater benefits of such regulation in civil-law countries where the investors' rights are weakly protected in comparison with firms in common-law countries. Then,

H1: The impact of growth opportunities on bank debt maturity will be greater on firms of civil-law than on firms of common-law countries after the introduction of additional regulation on corporate governance.

Beck and Levine (2002) and Demirgüç-Kunt and Maksimovic (2002) point that, on the one hand, firms use short-term bank debt to mitigate the moral hazard problems of

such deficit of funds and, on the other hand, the access to external finance is contingent on institutional development. Therefore, firms with deficit of funds are more likely to be in an inefficient liquidation process and/or in an inefficient debt pricing for longer maturities (Houston, Venkataraman 1994; Shleifer, Vishny 1992). Stulz (2000) confirms that banks are more efficient in supplying funds to those companies that require staged financing as the need for funds appears. As Diamond (2004) suggests, in legal systems with ineffective contract enforcement, more short-term debt will be used as a governance device to minimize the misbehavior of the borrower. Empirically, Bae and Goyal (2009) and Qian and Strahan (2007) show that better enforceability of contracts increases loan size and lengthens loan maturity. Then, we can derive out of this idea that when a certain legislation reduces the opportunistic behavior of managers and enhances the firms' transparency, firm might do without short-term bank debt to cope with the agency conflicts. Thus, our second hypothesis states that:

H2: The new regulations on corporate governance make less relevant the role of bank debt maturity to solve the asymmetric information and agency problems caused by the deficit of funds.

The relationship between managerial ownership and bank debt maturity is basically explained by the interaction of the convergence and the entrenchment hypotheses. García-Teruel and Martínez-Solano (2010) suggest that at low levels of insider ownership, managers would prefer to lengthen debt maturity in order to avoid the expected costs from liquidity risk. Additionally, at higher levels of managerial ownership, an entrenchment effect may prevail, and the advise effects of firm value or on the capacity of managers to obtain debt, may persuade them to raise the proportion of short-term debt. These arguments suggest a non-monotonic relationship between short-term bank debt and closely held ownership. Nevertheless, we might suggest that such relationship might become less relevant in civil-law than in common-law countries once new regulations on transparency are passed. Concentrated ownership structures are the catalyst to protect the investors' rights in civil-law countries. Therefore, when the institutional system through the regulation improves such protection, the ownership structure reduces its relevance as a governance device. Thus, our third hypothesis is that:

H3: The interaction of the convergence and the entrenchment hypotheses turns out a non-linear relationship between the closely held ownership and the short-term bank debt. Such relationship across-countries reduces its relevance more in the civil-law than in common-law regimes after the application of corporate governance legislation.

2. Data and variables

2.1. Sample

In order to test the hypotheses, our source of information is twofold: financial information and firm's market value are from OSIRIS Data Base; whereas the information about the ownership structure is gathered from THOMSON ONE BANKER. Our total sample

includes 2,591 non-financial traded firms from common-law countries: Australia (301), Canada (252), the United Kingdom (328), and the United States (560); and civil-law countries: Belgium (124), Denmark (141), France (262), Germany (285), Italy (199), and Spain (139). There is a total of 17,285 firm-year observations with an average of 6.7 observations per firm and at least 5 consecutive years. The period under study starts in 1996 and ends in 2008 in order to avoid the distortions in the results that might be caused by the recent financial crisis.

The panel data is unbalanced and excludes financial firms and firms that have no debt in their balance sheets. The sample is broken up into firms from common-law countries (55.62%) and firms from civil-law countries (44.38%). We compare the results for the pre- and post- periods of the new and more relevant legislation on corporate governance in order to consider the structural change generated by these new regulations that require more transparency in the information systems, in the compensation of executives, and audit committees to eliminate the conflict of interest between insiders and outsiders (see Table 1). The event we study is when a country passes corporate regulation, hard law, which favors transparency after the financial scandals. Similarly to Aguilera and Cuevo-Cazurra (2004, 2009), for reasons of consistency, our database includes only regulations on governance and transparency per se. We exclude revisions of laws, corporate disclosure codes, reports on compliance with codes already in place, and codes on the behavior of executives. The starting point of all these legislations was the Sarbanes-Oxley Act (SOX) promulgated in the USA in July 2002.

2.2. Variables measurement

The dependent variable, the maturity of bank borrowing, is measured as the ratio of short-term bank debt to total bank debt (SBDBD) (Qian, Strahan 2007).[1] Among the independent variables, we used the market to book value ratio (Q) as a proxy for growth opportunities (Goyal *et al.* 2002). The need for external funds (NEF) to finance the firm's new investments was calculated according to Shyam-Sunder and Myers (1999) as:

$$NEF_{i,t} = DIV_{i,t} + I_{i,t} + \Delta WC_{i,t} + R_{i,t-1} - C_{i,t} = \Delta LTD_{i,t} + \Delta E_{i,t}, \quad (1)$$

where $DIV_{i,t}$ is the cash dividend of firm i at time t; $I_{i,t}$ is the net investment; $\Delta WC_{i,t}$ is the change in working capital; $R_{i,t-1}$ is the current portion of long-term debt at the start of the period; $C_{i,t}$ is the cash flow after interest and taxes; $LTD_{i,t}$ is the long-term debt issued; and $\Delta E_{i,t}$ is the net equity issued.

We used the percentage of closely held stocks as a measure of ownership concentration (*OWN*). It corresponds to the percentage of shares in the hands of the controller stockholder plus the ownership of the managers.

The firm's size, return on assets, the growth of sales, the bankruptcy risk, the non-debt tax shield, the leverage and assets' tangibility are control variables. These variables

[1] The size of the firms' sample per country is representative of each country in terms of total assets and market capitalization.

appear in most of the empirical works on bank debt (Bae, Goyal 2009). The logarithm of the book value of firm assets is our measure of firm size (LNTAB). The profitability corresponds to the return on assets (ROA) measured as the earnings before taxes over total assets. Sales growth is the measure of the firm's activity (SGROWTH) (Vallelado, Saona 2011). We measured the bankruptcy risk (RISK) as EBITDA plus equity over total assets and all this divided by the standard deviation of asset returns according to Fahlenbrach *et al.* (2012). RISK is therefore a measure of the distance from insolvency, where a high ratio indicates that the firm is less risky. Annual depreciation over total assets is the measure for non-debt tax shield (NDTS) (Graham 1999). We have also included the leverage (TDTE) measured as debt over equity and the asset tangibility (TANG) which is computed as the property, plant and equipment over total assets (Qian, Strahan 2007).

We use a dummy variable (CG) to measure the introduction of new legislation on corporate governance. This variable takes value 1 for the year following passage of the regulation in the subject country and 0 otherwise. Thus, for companies in Denmark, Germany, Italy, and USA CG takes value 1 in 2002 and afterwards; for companies in Australia, Canada, France, and Spain CG takes value 1 in 2003 and afterwards; and for companies in Belgium and UK CG takes value 1 in 2004 and afterwards. Likewise, we distinguish companies operating in civil-law and common-law countries by estimating separated regressions. Additionally we included country, industry, and time dummy variables.

3. Method

First, we perform a descriptive analysis and a mean-difference analysis by each institutional framework and by the pre- and post- periods of implementation of the corporate governance legislation. Second, we carry out an explanatory analysis applying panel data econometrics.

Panel data econometrics allows us to control for unobservable heterogeneity and the endogeneity problems by applying the Generalized Method of Moments (GMM) (Arellano, Bond 1991). We face the common problem of simultaneity, given that some of the independent variables included in our integrated model, such as the growth opportunities, the deficit of funds, ownership, profitability, or the bankruptcy risk can be determined simultaneously by the dependent variable. We use two-stage GMM estimations to control for fixed effects and to adequately consider endogeneity, improving the robustness and consistency of our estimators.

Since the quadratic form of the percentage of closely held shares (OWN^2) is used later on in the empirical analysis – see Tables 2 and 3 – the Lind and Mehlum (2010) statistic contrast (LM) is applied to test the existence of a U-shaped relationship between the *OWN* and the *SBDBD* variables. To test multicollinearity problems we run the Variance Inflation Factor (VIF) for every single regression. Following Vallelado and Saona (2011), we use an autoregressive, dynamic model to test our hypotheses that takes the following form:

$$SBDBD_{i,t} = \beta_0 + \beta_1 SBDBD_{i,t-1} + \beta_2 Q_{i,t} + \beta_3 NEF_{i,t} + \beta_4 OWN_{i,t} + \beta_5 OWN^2{}_{i,t} + \beta_6 LNTAB_{i,t} + \beta_7 ROA_{i,t} + \beta_8 SGROWTH_{i,t} + \beta_9 RISK_{i,t} + \beta_{10} NDTS_{i,t} + \beta_{11} TDTE_{i,t} + \beta_{12} TANG_{i,t} + \beta_{13} CG_{i,t} + \beta_{14} LEGALSYS_{i,t} + v_{i,t}, \quad (2)$$

where $v_{i,t} = \varepsilon_{i,t} - (\lambda_{i,t})\varepsilon_{i,t-1}$ and consequently the adjustment cost to the optimal short-term bank debt ratio is defined as $\beta_1 = (1 - \lambda)$.[2] Therefore, λ corresponds to the adjustment rate towards the firm's target short-term bank debt and is interpreted as the percentage of the target bank-debt maturity achieved by the firm during a one-year period. The higher the coefficient of β_1, the further away from the target the firm will be.

4. Results

4.1. Descriptive analysis

Firms have on average a higher proportion of short-term bank debt in the civil-law regime – lower maturity (31.38%) – than in the common-law (19.0%), as predicted by the law and finance prescriptions (La Porta *et al.* 1998). We observe a significant increase in the proportion of short-term bank debt after the implementation of corporate governance regulation in both institutional contexts (Table 1).

Table 1. Descriptive statistics and test of mean differences among the variables by legal system and application of corporate governance legislation

Variables	Mean			Dif. stat. signif.	Mean common-law		Dif. stat. signif.	Mean civil-law		Dif. stat. signif.
	Total sample	Common law	Civil law		Pre-CG	Post-CG		Pre-CG	Post-CG	
SBDBD	0.209	0.190	0.314	***	0.178	0.199	***	0.178	0.199	*
Q	1.235	1.247	1.167	***	0.715	1.642	***	0.715	1.642	***
NEF	0.078	0.092	0.005	***	0.231	–0.011	***	0.231	–0.011	**
OWN	0.313	0.279	0.493	***	0.281	0.278		0.281	0.278	***
LNTAB	12.917	12.819	13.443	***	12.775	12.852	*	12.775	12.852	***
ROA	0.022	0.020	0.034	***	0.024	0.017	***	0.024	0.017	
SGROWTH	0.156	0.158	0.147		0.257	0.084	***	0.257	0.084	
RISK	6.835	6.554	8.343	***	6.952	6.259	***	6.952	6.259	*
NDTS	0.003	0.001	0.018	***	0.001	0.000		0.001	0.000	*
TDTE	1.889	1.728	2.750	**	1.746	1.715	*	1.746	1.715	***
TANG	0.544	0.555	0.484	***	0.550	0.559	**	0.550	0.559	
OBS.	17,285	9,591	7,694		4,083	5,508		3,405	4,289	

Note: ***, **, and * represent significance at 1%, 5%, and 10%, respectively.

[2] These adjustment costs take into account factors such as taxation, bankruptcy costs, renegotiation costs of debt, and debt issuance costs, among others.

Firms in civil-law countries are more levered that in common-law countries (2.75 vs. 1.73 times), in line with law and finance proposals. Companies operating in civil-law countries reduced their leverage significantly after the implementation of corporate governance regulations. This change is in line with Fan *et al.* (2012), showing that the content of law is key on the capital structure choice.

Firms in common-law countries have statistically more growth opportunities than in civil-law countries. However, it is after the implementation of corporate governance regulation when we observe a significant increase in growth opportunities that is particularly relevant in common-law countries.

4.2. Regression analysis

The results show a significant and positive effect of the one-period lagged dependent variable ($SBDBD_{t-1}$) on the bank-debt maturity (Table 2). The coefficients for the one-period lagged dependent variable are between zero and one, which means that short-term bank debt converges to a certain desired level over time. In general, the adjustment speed is higher after the implementation of the corporate governance legislations. This finding highlights the positive impact of this legislation in helping firms to make their financial decisions more dynamically and in reducing the adjustment costs, which are a source of market imperfection.

In agreement with Öztekin and Flannery (2012)'s findings, the results of Table 3 indicate that the speed of adjustment is quite high in both institutional contexts after the implementation of the corporate governance legislation, thus confirming our hypothesis that civil-law companies have benefited the most from improvements in transparency. Before the implementation of corporate governance regulations, there were significant differences in the adjustment speed: faster in common-law (94%) than in civil-law (57%) countries. After corporate governance regulation, both sets of countries show a speed of adjustment to optimal maturity close to 1: 94% vs. 93%, respectively. Thus, the implementation of transparency has had a greater impact on civil-law countries as hypothesized in H1. As the new regulation reinforces shareholders rights, bank lenders in civil-law countries react more quickly to avoid wealth transfers from them to stockholders. In other words, the cost of remaining outside the optimal ratio is high relative to the adjustment costs once the new legislation is in place. The results indicate that during the pre-legislation period, the costs of staying outside of the target for companies in civil-law countries were low relative to the adjustment costs. In those bank-oriented countries, since firms have much closer ties with their banks than in common-law countries, it was thus feasible for them to adjust slowly toward their target level (Antoniou *et al.* 2008). Once the new codes of corporate governance were applied, the adjustment costs decreased substantially for companies in civil-law countries. In Table 2, for instance, companies reduced their adjustment period from 18.5 to 12.7 months in the post-corporate governance period[3].

[3] The adjustment period is computed as Log2/Log (1 + λ).

Table 2. Determinants of bank debt maturity for the whole sample

Variables	Total sample		Pre-CG		Post-CG	
Intercept	0.423	***	0.564	**	0.432	***
$SBDBD_{t-1}$	0.113	***	0.132	**	0.083	***
Adj. Speed $\lambda = (1 - \beta)$	0.887		0.868		0.917	
TDTE	–0.001	***	–0.002		0.000	
TANG	–0.389	***	–0.596	***	–0.240	***
LNTAB	0.003		0.014	***	–0.004	
ROA	–0.146	***	–0.141	**	–0.225	***
Q	0.006	***	0.013	***	0.009	**
SGROWTH	–0.013	***	0.002		–0.015	***
NEF	–0.007	***	–0.002		–0.009	***
RISK	0.004	***	0.004		0.007	**
OWN	–0.023	**	0.297	***	–0.181	***
OWN^2	–0.011		–0.309	***	0.151	***
NDTS	0.041		–0.117		–0.118	
CG	0.005	**				
LEGALSYS	–0.122	***	–0.353		–0.109	**
Obs.	17,285		7,488		9,797	
AR 2 p-value	0.140		0.621		0.088	
LM t-value	0.311		0.001		0.022	
Sargan p-value	0.498		0.250		0.420	
Hansen p-value	0.487		0.212		0.520	
VIF	1.25		1.16		0.92	

Notes: 1. ***, **, and * represent significance at 1%, 5%, and 10%, respectively. 2. The adjustment speed towards the target bank-debt maturity is estimated as $\lambda = (1 - \beta_1)$.

The results in Table 2 show that higher growth opportunities are associated with lower bank debt maturity, which means that the problems of underinvestment and asset substitution are more relevant than inefficient liquidation. Such relation remains the same before and after the implementation of corporate governance regulation. However, the economic relevance of such relationship changes if transparency increases. Before the new regulation, the reduction on bank debt maturity caused by an increase in growth opportunities is almost 1.5 times higher (0.013 vs. 0.009) than after the new regulation, indicating that as regulation imposes higher transparency, the role of bank debt maturity to prevent underinvestment and asset substitution becomes weaker. This finding supports the substitutability hypotheses of short-term bank debt by external regulations as corporate governance mechanisms.

By legal system, we observe that after the implementation of corporate governance regulation, only companies that operate in civil-law countries address the agency problems of growth options through higher levels of short-term bank debt. In the common-law

context the findings are not statistically significant. Companies operating in civil-law settings keep on using short-term bank debt to cope with the problems of asymmetric information and agency costs associated with higher growth opportunities even though the new law reinforces transparency to lessen agency costs. Therefore, our results suggest that in bank-based financial systems the short-term bank debt and the regulation on transparency are complementary corporate governance mechanisms; whereas in common-law countries the new legislation substitutes bank debt maturity as a governance device.

The relationship between funding needs (NEF) and bank debt maturity loses its relevance in common-law countries once tighter regulation on corporate governance was adopted (Table 3). A plausible explanation is that the new regulation forces a wider disclosure policy which reduces the asymmetries of information and agency costs. As longer debt maturity is less underpriced, companies reduce their preference for short-term bank debt.

Table 3. Determinants of bank debt maturity by legal system

	Common-law				Civil-law			
	Pre-CG		Post-CG		Pre-CG		Post-CG	
Intercept	0.254	**	0.523	***	–0.304	***	0.145	***
$SBDBD_{t-1}$	0.063	*	0.058	***	0.433	***	0.071	***
Adj. speed ($\lambda = 1 - \beta$)	0.937		0.942		0.567		0.929	
TDTE	–0.003	**	–0.003	***	–0.003	***	0.002	***
TANG	–0.576	***	–0.294	***	–0.239	***	–0.281	***
LNTAB	0.009	**	–0.016	**	0.039	***	0.023	***
ROA	–0.135	**	–0.206	***	0.298	***	–0.079	***
Q	0.016	***	0.002		–0.070	***	0.016	***
SGROWTH	0.005		–0.009	**	–0.013		0.022	***
NEF	–0.003		–0.001		–0.058	***	–0.003	***
RISK	0.006	***	0.005	**	–0.004	***	0.002	***
OWNN	0.281	***	–0.105	***	0.392	***	–0.295	***
OWN^2	–0.240	***	0.035	*	–0.246	***	0.259	***
NDTS	0.185		–0.207		–0.120	***	0.032	***
Obs.	4,083		5,508		3,405		4,289	
AR2 p-value	0.511		0.022		0.243		0.929	
LM t-value	0.000		0.055		0.000		0.033	
Sargan p-value	0.532		0.310		0.389		0.274	
Hansen p-value	0.532		0.488		0.874		0.941	
VIF	1.54		1.22		1.40		1.77	

Notes: 1. ***, **, and * represent significance at 1%, 5%, and 10%, respectively. 2. The adjustment speed towards the target bank-debt maturity is estimated as $\lambda = 1 - \beta_1$.

The situation is clearly different for firms in civil-law countries, which supports our Hypothesis H2. In this case, there is always a negative and statistically significant relationship between NEF and SBDBD for the sub-samples in the pre- and post-corporate governance regulation periods. However, the economic impact of a change in NEF on the proportion of short-term bank debt decreases substantially after the introduction of new corporate governance law (estimated coefficients of –0.058 vs. –0.003).

The ownership concentration (OWN) plays a major role in explaining bank debt maturity in the two legal regimes (Table 3). Before the new legislation, the ownership structure and the bank debt maturity were complementary mechanisms of governance, but they became interchangeable substitutes after the legislation. Lenders and borrowers will focus on inefficient liquidation if transparency lessens the expropriation risk of a concentrated ownership. This finding is in line with the recent work of Cuomo *et al.* (2013) who suggest that legal reforms improving the protection of investor's rights reduce the need of others controlling mechanisms such as bank debt maturity.

Since highly concentrated ownership structures can cause the firm's value to decrease as highlighted by the expropriation hypothesis (García-Teruel, Martínez-Solano 2010), we included in the estimations the quadratic transformation of the percentage of closely held shares (OWN^2). We observe a non-linear, inverse U-shaped relationship between the ownership concentration and the short-term bank debt (see Table 2). The Lind and Mehlum (2010) test demonstrates that such inverse U-shaped relationship between the ownership closely held and the short-term bank debt is statistically significant. In fact, for the two institutional contexts the amount of short-term debt tends to increase as the ownership gets more concentrated (see Table 3); after achieving a certain threshold of concentration (58.7% and 79.7% for common-law and civil-law companies, respectively)[4] the short-term bank debt decreases (see Table 3). This finding is observed for the pre-corporate governance period across the countries. However, such relationship changes after the application of the new regulation. In this case, the quadratic term is only significant in the civil-law context. Thus, we observe that the proportion of short-term bank debt declines as ownership concentration increases, but when the threshold of concentration of the ownership is crossed (57%), the short-term bank debt increases. The benefits of more transparency allow lenders to focus more on inefficient liquidation rather than on expropriation risk. Thus, banks in civil-law countries force shorter bank debt maturities when controlling shareholders have more than 57% of the outstanding stocks.

We have several significant findings concerning the control variables. First, we can see that the impact of the firm size (*LNTAB*) on *SBDBD* is contingent on the institutional setting. Specifically, the size of firms in common-law countries had an asymmetric impact on the demand for short-term bank debt before and after the legislation. For instance, 1% increase in the firm size caused a 0.009% increase in *SBDBD* in the pre-

[4] The estimation of such thresholds is done by computing the first derivative of this regression with respect to the *OWN* variable, and then making it equal to zero. Then we have to solve for *OWN* which represents the point at which the *SBDBD* is optimized.

corporate governance period, but a decrease of 0.016% after the legislation. In civil-law countries however, the impact of firm size is recorded always positive on *SBDBD*.

Profitability (*ROA*) determines the bank debt maturity in the same manner in both institutional contexts after the corporate governance regulation. The firm's activity (*SGROWTH*) presents a different relationship with bank debt maturity depending on the legal system. Firms in civil-law countries use more short-term bank debt as the growth rate of sales increases than in common-law countries.

Concerning the bankruptcy risk (*RISK*) we can see that firms in civil-law countries defer this risk to the long-term by reducing the proportion of short-term bank debt before the governance regulation change. The results for firms in common-law countries show that as their bankruptcy risk increases, they tend to use more short-term bank debt.

Non-debt tax shields (*NDTS*) appear to drive the bank debt maturity under the civil-law context only. Our results show that firms with more debt in common-law countries can minimize their refinancing risk driven by leverage (*TDTE*) by borrowing longer-term bank debt. In civil-law countries it appears that after the new regulation, firms use more short-term bank debt as leverage increases.

As a robustness check of our results, we ran model specifications exchanging the dependent variable (*SBDBD*) for a new variable that considered the short-term bank debt over total assets. The results were consistent and robust with this alternative dependent variable. Although some minor loss of significance was observed for *NDTS* and *ROA*, it does not invalidate our findings. For brevity reasons we do not include these results here but they are available upon request to the authors.

Conclusions

We observe that the implementation of corporate governance regulation had a greater impact on companies operating in civil-law than in common-law countries in reducing agency costs and promoting transparency. There is a substitution effect between bank debt maturity and the ownership structure after the application of the new regulation on corporate governance in both institutional settings. If transparency improves, banks, as supplier of funds, focus more on inefficient liquidation than on expropriation by controlling shareholders. Likewise, we find that after the implementation of new rules on firms' transparency, the asymmetries of information and agency costs related to growth opportunities are better solved by shortening the bank debt maturity in the common-law context. Bank debt maturity has lost relevance as a disciplining device in the civil-law countries since the implementation of new rules on corporate governance. Consequently, managers can then reduce inefficient liquidation by increasing debt maturity when transparency improves.

As a summary, our contribution is that corporate governance laws have greater influence on civil-law countries than in common-law countries in promoting transparency and in the use of bank debt maturity as a governance tool. There is further research that can be done in this area like the analysis of new contexts such as firms from emerging economies and/or considering how the recent financial crisis determined bank debt maturity decisions.

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