INFLUENCE OF FORMAL AND INFORMAL INSTITUTIONS ON DEBT CONDITIONS

ABSTRACT

This paper analyses the effect of formal and informal institutions on debt conditions for a sample of 37 countries over the period 2001-2012. The econometric methodology that we have used is panel data with fixed effects. The results show that greater legal enforcement, efficient institutions and greater trust tend to reduce the cost of debt and increase maturity. Moreover, this analysis has been carried out considering the degree of economic development and the joint effect of formal and informal institutions. Regarding with the degree of economic development, the results show that both formal and informal institutions has a greater influence in countries with a lower degree of economic development. As far as the joint effect of formal and informal institutions are concerned, our results support the view that formal and informal institutions act as substitutes in improving debt conditions.

Keywords:

Cost of debt; Maturity; Trust; Rule of law; Legal index.
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1. INTRODUCTION

Recently, the financial literature on firm capital structure has analysed how laws and institutions act as determinants of debt conditions, based on the premise that access to external financing depends partly on the legal and institutional system of each country, as this provides the mechanism to monitor and ensure financial contracts. Demirgüç-Kunt and Maksimovic (1999) and Fan et al. (2012) analyse how institutions affect firm debt maturity. Qian and Strahan (2007) and Bae and Goyal (2009) examined the influence of institutional quality in explaining the different terms of bank loans. As a result, this literature has highlighted the importance of the legal and institutional quality of countries in improving debt conditions, specifically reducing the cost of debt and increasing maturity.

On the other hand, there are several papers related to the positive role of informal institutions. He and Hu (2016) examine the effect of religion on bank loan terms. They show that corporate borrowers located in counties of USA with high level of religiosity are charged lower interest rates, have larger loan amounts and fewer loan covenants. Chui et al. (2002), Li et al. (2011), Giannetti and Yafeh (2012), Zheng et al. (2012), and Chui et al. (2016) have investigated the impact of cultural factors on debt conditions.

In this context, the present paper examines the effect of both formal and informal institutions on debt conditions. Specifically, we analyse the separately effect of formal and informal institutions, and then we consider the joint effect to analyse whether formal and informal institutions are complementary or substitutive mechanisms in improving debt conditions. On the other hand, we also analyse whether the effect of formal and informal institutions on debt conditions depending on the degree of economic
development of each country. This analysis has been carried out for a sample of 21,790 firms from 37 countries over the period 2001-2012, giving a total of 143,463 observations.

We contribute to the literature in several ways. First, we analyse the effect of trust on debt conditions in an international context. Qian et al. (2017) analyse the effect of trust on loan characteristics of size, source, collateral requirement, and value of collateral, for a sample of 25 countries. However, their paper considers neither maturity nor the cost of debt as dependent variables nor does it take into account developed countries as their paper focuses on how institutional environment affect bank loan characteristics in developing countries. Second, we examine if the effect of trust on debt conditions is different depending on the degree of economic development. Less developed countries are usually characterized for having weak institutions, based on this idea trust could be more relevant in these countries in improving debt conditions. Finally, we consider the joint effect of formal and informal institutions in improving the debt conditions. To our knowledge, this is the first paper in analyses the joint effect of formal and informal institutions on the cost of debt and the maturity structure. Financial literature has focused on the separately impact of formal and informal institutions, only the paper of Qian et al. (2017) analyse the joint effect of those institutions but on loan size, loan source and collateral requirement.

In general, our results show that both formal and informal institutions improve debt conditions reducing the cost of debt and increasing the debt maturity. Furthermore, our results show that this effect is greater in countries where there are a lower degree of economic development. Finally, our results indicate that there is a joint effect of formal and informal institutions in reducing the cost of debt; specifically we show that there is a
substitute effect between formal and informal institutions in reducing the cost of debt and increasing debt maturity.

The rest of the paper is organized as follows. Section 2 reviews the related literature and develops testable hypothesis on formal and informal institutions as determinants of debt conditions. Section 3 describes our data and present the descriptive statistics of our variables. Section 4 reports the empirical results. Finally, section 5 conclude the paper.

2. REVIEW OF THE LITERATURE AND HYPOTHESES
The idea of social capital has generated special academic attention since Putnam published the book called *Making Democracy Work (1993)*, in which he showed that social capital is an important determinant of the differences in the economic and government performance of northern and southern Italy. Coleman (1990) and Putnam (1993) refer to trust as a manifestation of social capital. La Porta et al. (1997), based on the studies of Coleman (1990), Putnam (1993) and Fukuyama (1995), has defined trust as “a propensity of people in a society to cooperate to produce socially efficient outcomes and to avoid inefficient noncooperative traps such as that in the prisoner’s dilemma.” Since Putnam (1993), there have been several studies that has focused on the effect of trust on economic performance. Some examples are as follow: La Porta et al. (1997) reveal that trust promotes cooperation, especially in large organizations. Knack and Keefer (1997) reveal that trust has significant impact on aggregate economic activity. Zak and Knack (2001) show that low trust environments reduce the rate of investment. Goergen et al. (2013) found that country trust increases firm performance. More recently, Fernández and González (2017) show that trust enhances corporate valuation. This literature reflects that more trusting environments reduce the costs of economic activities that require some participants to rely on the future actions of others.
According to North (1994), “Institutions are the humanly devised constraints that structure human interaction. They are made up of formal constraints (e.g., rules, laws, constitutions), informal constraints (e.g. norms of behaviour, conventions, self-imposed codes of conduct), and their enforcement characteristics. Together they define the incentive structure of societies and specifically economies.” There have been studies that have focused on the effect of formal institutions on debt conditions (cost of debt and maturity) such as those of Demirgüç-Kunt and Maksimovic (1999), Qian and Strahan (2007), Bae and Goyal (2009) and Fan et al. (2012). Other studies (Chui et al., 2002; Li et al., 2011; Giannetti and Yafeh, 2012; Zheng et al., 2012; Chui et al., 2016; He and Hu, 2016; and Qian et al., 2017) have focused on the effect of informal institutions on debt conditions. They analyse how different dimensions of culture (collectivism, masculinity or power distance among others) influence firm capital structure, but they do not directly refer to the factor of trust. Except for the paper of Qian et al. (2017) which analyse the effect of trust on loan characteristics of size, source, collateral requirement, and value of collateral, for a sample of twenty-five developing countries. Based on the study of North (1994) we have considered relevant to analyse the effect of both formal and informal institutions on debt conditions. The literature review is organised as follows. We start by reviewing the literature on formal and informal institutions and their effect on debt conditions. Then, in section 2.2 we review the literature on economic development.

2.1. Formal institutions and informal institutions

In financial contracts, when establishing the conditions of the debt, both formal and informal institutions are important. The existence of effective formal institutions, as an efficient judicial system or laws that guarantee the protection of creditor rights, leads to a better financial environment that will allow setting better conditions in financial contracts. But higher trust societies also bring benefits for lenders as include less expenses
associated with protecting individuals from being exploited in economic transactions or less covenants in written contracts to specify potential contingencies, among others. Hence when lending to a firm, the lender must assess not only the credit quality of borrower but also the risk due to weak laws or institutions and the risk associated with less trusted societies.

Relating to informal institutions, according to Knack and Keefer (1997), “Trust-sensitive transactions include those in which goods and services are provided in exchange for future payment, employment contracts in which managers rely on employees to accomplish tasks that are difficult to monitor, and investments and savings decisions that rely on assurances by governments or banks that they will no expropriate these assets.” Based on this definition, we can consider the relation between a lender and a firm partly as a trust-sensitive transaction, given that when a lender lends money to a firm, it has to trust that the firm will meet the requirements of the contract. Knack and Keefer (1997) argue that trust reduce the cost of the principal dealing with an agent required to carry out some activities at a future date, and thus trust has economic benefits. Therefore, in countries with high levels of trust, it could be expected that lenders spend less to protect themselves from counterparty risk and therefore they could be more willing to provide credit on favourable terms. In line with these arguments, our first hypothesis is:

**H1:** We expect better conditions of debt (lower cost of debt and longer maturity) in countries with higher levels of trust.

As far formal institutions, the higher the efficiency of the legal system of a country, the safer the country will be with regard to investing in it and hence lenders will be willing to offer credit on better terms. If a country’s degree of rule of law is high, this indicates that the justice system works properly and the country is safer in terms of investing in it. On the other hand, greater protection of the rights of creditors gives lenders greater power
in the case of bankruptcy and the risk assumed by them will be lower. Moreover, strong protection of the rights of creditors increases the incentives of borrowers to repay loans and avoid bankruptcy situations. Therefore, in a country with strong creditor rights, lenders will be willing to provide credit under better conditions. Bae and Goyal (2009) show that banks responds to poor enforceability of contracts by reducing loan amounts, shortening loan maturities, and increasing loans spread. Qian and Strahan (2007) show that under strong creditor protection, loans have more concentrated ownership, longer maturities, and lower interest rates. Demirgüç-Kunt and Maksimovic (1999) find evidence that large firms in countries with effective legal systems have more long-term debt relative to assets, and their debt is of longer maturity. And Fan et al. (2012) show that firms in countries that are viewed as more corrupt tend to use more short-term debt. Hence in keeping with the law and finance view, the legal system and the protection of creditor rights thus seem to enhance loan conditions. We also consider relevant to analyse the interactive effect of formal and informal institutions on debt conditions, for that we are going to consider the interaction term between trust and rule of law and between trust and creditor rights.

There had been several studies that had analysed the relationship between trust and formal institutions. Goergen et al. (2013) found that both employee rights and investor rights are negatively correlated with country trust. Hence, country trust seems to act as substitute for strong institutions.

More recently, Qian et al. (2017) consider a sample of twenty-five developing countries and analyse the interactive relationship between formal and informal institutions in affecting bank loans. They explore whether the effect of informal institutions on bank loans is the same under different levels of formal institutions. To test this, they perform split-sample regressions based on creditors and enforce. They consider as dependent
variables loan size, loan source and collateral requirement. They find no evidence of a relationship between trust and formal institutions neither from the perspective of loan source or loan size. In the case of collateral requirement, they find that trust only reduce collateral requirement for the sample with worse legal protection and worse legal enforcement, indicating that informal institutions can be an alternative to formal institutions in reducing collateral requirements, when formal institutions are weak.

According to results obtained by Qian et al. (2017), we could expect that trust acts as an alternative to formal institutions in improving debt conditions when formal institutions are weak. In countries where law enforcement and legal protection are less efficient, informal institutions could result more relevant in improving debt conditions because of the lack of efficient formal institutions. The second hypothesis is thus as follows:

**H2.** We expect formal and informal institutions to be substitutes in improving debt conditions.

### 2.2. Economic development

Levine et al. (2000) and Claessens and Laeven (2003) show that developing countries are characterized by poorer institutions and less information disclosure, which could increase the intensity of information asymmetries. The higher asymmetric information in developing countries could lead to a more important role of both formal and informal institutions in these countries compared with developed countries. For example, Knack and Keefer (1997) show that the impact of trust on growth is higher in developing countries. Moreover, we could expect a greater effect of informal institutions in developing countries compared to formal institutions due to the lower development of the latter. We consider the Gross National Income as indicator of economic development and analyse whether formal and informal institutions affect debt conditions differently depending on the development of the countries. The third hypothesis is thus as follows:
H3: We expect formal and informal institutions to have a greater influence on debt conditions (cost of debt and maturity) in countries with a lower degree of economic development.

3. DATA

3.1. Sample selection

The database used to analyse the effect of formal and informal institutions on debt conditions was obtained from the Worldscope Database and covers the period 2001-2012. This database contains economic-financial and stock-market valuation information for over 51,000 firms from 70 countries. Finally, our analysis considers 21,790 non-financial firms from 37 different countries, giving a total of 143,463 observations. Table I shows how these firms are distributed among the different countries considered.

The baseline model of the paper is the following:

\[
DV_{it} = a_0 + a_1 \text{LEVERAGE}_{it-1} + a_2 \frac{\text{EBIT}}{\text{INT}}_{it-1} + a_3 \text{PROFITABILITY}_{it-1} \\
+ a_4 \text{TANGIBILITY}_{it-1} + a_5 \text{SIZE}_{it-1} + a_6 \text{INFLATION}_{it-1} \\
+ a_7 \text{RULE OF LAW}_{jt} + a_8 \text{LEGAL INDEX}_{jt} \\
+ a_9 \text{RULE OF LAW} \times \text{LEGAL INDEX}_{jt} + a_{10} \text{TRUST}_{jt} \\
+ \sum_{t=2001}^{2012} Y_t + \sum_{j} G_j + \sum_{n} I_n + \epsilon_{it}
\]

We use two different dependent variables (DV): (1) the cost of debt that is defined as the ratio of financial expenses and total debt. This definition has been used in several papers such as Jun and Jen (2003), Pittman and Fortin (2004), Zou and Adams (2008), and Piot and Missonier-Piera (2009). Financial expenses are all those expenses from external financing. Total debt represents all debts with cost and is the sum of short- and long-term financing.

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1 The number of countries considered depends on the availability of proxies of formal and informal institutions.

2 Preliminary descriptive statistics indicate that the outcome provides abnormal values and thus may introduce noise in the measurement of the effective interest rate of the firm. Hence, we winsorized the cost of debt variable at the top and bottom 1% of its distribution.
debt. Total debt is defined considering the average debt, which is the average of total debt at the beginning and the end of the period\textsuperscript{3}. And (2) the maturity structure that is defined by the ratio of long-term debt and total debt\textsuperscript{4}.

We have considered as formal institutions two variables namely the quality of the institutional environment measured by rule of law (RULE\_OF\_LAW) and protection of the rights of lenders and borrowers (LEGAL\_INDEX). We have considered as informal institution the level of trust (TRUST). In line with previous research analysing debt conditions (Qian and Strahan, 2007; Bae and Goyal, 2009), we also include control variables at the company level. These variables are as follow\textsuperscript{5}: level of leverage (LEVERAGE), the ratio between earnings before interest and taxes and interest (EBIT/INT), profitability (PROFITABILITY), assets’ tangibility (TANGIBILITY), and firms’ size (SIZE).\textsuperscript{6} We have also controlled for the level of inflation (INFLATION) in each of the countries. All independent firm-level variables are lagged by one year to control for potential problems of endogeneity. We included temporary effects ($Y_t$). All company-level variables were obtained from the Worldscope Database. The definition of these variables is presented in greater detail in the following paragraphs.

\textbf{3.2. Formal and informal institutions}

The formal institutions variables we considered are the rule of law and protection of borrowers and lenders’ rights. Rule of law measures perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the

\textsuperscript{3} Results are similar using debt at the end of the period.

\textsuperscript{4} We also winsorized the maturity variable at the top and bottom 1\% of its distribution.

\textsuperscript{5} When the dependent variable is the cost of debt (maturity), we consider maturity (cost of debt) as control variable.

\textsuperscript{6} We address extreme values by winsorizing the firm-level variables at the top and bottom 1\% of their distribution.
likelihood of crime and violence. The source from which we extracted the data is WGI (Worldwide Governance Indicators) database from the World Bank. The values of this indicator range between -2.5 and 2.5; lower values reflect poor rule of law, while higher values reflect a highly efficient legal system. This measurement is similar to those used by Demirgüç-Kunt and Maksimovic (1999) and Bae and Goyal (2009) who used the variables of law and order, and property rights, respectively.

To analyse the impact of the protection of creditor rights, we included the strength of the legal rights index, which measures the degree to which collateral and bankruptcy laws protect the rights of borrowers and lender and thus facilitate lending. The index ranges from zero to 10, with higher scores indicating that these laws are better designed to expand access to credit. The data are collected from de World Bank/IFC “Doing Business” database. The legal rights index includes eight aspects related to legal rights in collateral law and two aspects in bankruptcy law. A score of one is added for each of the following features of the laws: (i) any business may use movable assets as collateral while keeping possession of assets, and any financial institution may accept such assets as collateral; (ii) the law allows a business to grant a non-possessory security right in a single category of revolving movable assets; (iii) the law allows a business to grant a non-possessory security right in substantially all of its assets, without requiring a specific description of the secured assets; (iv) a security right may extend to future or after-acquired assets and may extend automatically to the products, proceeds or replacements of the original assets; (v) general descriptions of debts and obligations are permitted in collateral agreements and in registration documents; (vi) a collateral registry is in operation that is unified geographically and by assets type and that is indexed by the name of the grantor of a security right; (vii) secured creditors are paid first (e.g. before general tax claims and employee claims) when a debtor defaults outside an insolvency procedure;
(viii) secured creditors are paid first when a business is liquidated; (ix) secured creditors are not subject to an automatic stay or moratorium on enforcement procedures when a debtor enters a court supervised reorganization procedure; and (x) the law allows parties to agree in a collateral agreement that the lender may enforce its security right of court.

The informal institution variable we considered is the level of trust. Our measure is identical to that used in the previous literature (e.g. Knack and Keefer, 1997; La Porta et al., 1997; Zac and Knack, 2001; Goergen, 2013; Goergen et al., 2013; and Fernández and González, 2017). It is sourced from the World Values Survey (WVS) and the European Values Study (EVS). We have used three “waves” of WVS (1999-2004, 2005-2007, and 2010-2014) and two “waves” of EVS (1999-2004 and 2008-2010). The question used to assess the level of trust in a society is: “Generally speaking, would you say that most people can be trusted, or that you can’t be too careful in dealing with people?” Our trust variable (TRUST) is the percentage of respondents in each country agreeing that “most people can be trusted” (after deleting the “don’t know” responses) against the alternative that “you can’t be too careful in dealing with people”. Most of these countries were included in at least two survey waves; we have considered the data of trust that is immediately prior to each of the observation that we have. For example, if I would like to analyse the cost of debt of 2006, I will have to have trust data prior to 2006.

A potential problem when considering country trust proxy is that that this variable can itself be affected by the development of other institutions. We resolve this question regarding the potential endogeneity of our trust proxy using instrumental variable estimations. We consider several variables as instruments of country trust. The proxies are religion, linguistic diversity, number of lawyers, and economic wealth per inhabitant,
as measured by the logarithm of GDP per capita\textsuperscript{7} (Goergen et al., 2013). Subsequently, we perform a Durbin-Wu-Hausman (DWH) test of overidentifying restrictions for each of the regressions. This test verifies the null hypothesis that the introduction of instrumental variables has no influence on the coefficients of the estimations. We hence perform a DWH F-test for each of the estimations in our paper, the results of which are reported in the penultimate row of each table. When the p value of the F-test is below 10 percent, the null hypothesis is rejected and the instrumental variables estimations are reported. Otherwise, the estimations with the observed values of trust variable are provided.

### 3.3. Country controls and firm characteristics

We also consider firm-level variables that can influence debt conditions (cost of debt and maturity) to control for the possible heterogeneity in borrower risk. We consider the following: the level of leverage, the ratio between EBIT and interests, profitability, assets’ tangibility, and firms’ size.

The level of leverage is a measure of credit risk; hence the higher the level of leverage of a firm, the greater the credit risk (Petersen and Rajan, 1994; Berger and Udell, 1995). This variable is defined as the ratio between total debt and total assets. Firms with higher levels of leverage are more likely to become insolvent in the future, and therefore moral hazard problems are more common in these firms. We would hence expect the cost of debt to increase with leverage, and the maturity decrease with leverage. However, a high level of leverage can also be a proxy for the fact that firms have earned a good reputation in the debt markets, which would improve the conditions of the loans (Piot and Missonier-Piera, 2009).

\textsuperscript{7} The Appendix provides a description of the variables used as instruments of the country trust variable.
We also consider the ratio between earnings before interest and taxes (EBIT) and interest. Greater values of this ratio indicate that the firm is able to generate sufficient resources to face its debt commitments, the firm will be solvent and this will lead to a better debt conditions (Petersen and Rajan, 1994; Zou and Adams, 2008).

Economic profitability is determined as the ratio of earnings before interest and taxes (EBIT) to total assets. The expected result is that the higher the value that this variable takes, the better the debt conditions. When a firm obtains high economic profitability, its ability to meet debt commitments will be higher, providing greater assurance to lenders and resulting in better debt conditions (Petersen and Rajan, 1994; Pittman and Fortin, 2004).

The tangibility of assets is measured as the ratio of tangible fixed assets to total assets. This definition of tangibility is used by authors as Antoniou et al. (2008), González and González (2008), and Zou and Adams (2008). The expected result for this variable is that the higher the proportion of tangible assets of the firm, the better the debt conditions. Provided they are not specific to the firm, tangible assets may be sold on the market and thus the firm will obtain liquidity. If most of the assets owned by a firm are tangible and the firm has trouble meeting its debt commitments, it can access the market and get cash. This will provide greater guarantees, which will in turn allow it to obtain financing in better conditions (Rajan and Zingales, 1995; Zou and Adams, 2008).

We proxied firm size as the natural logarithm of sales. As regards this variable, the result we expect to find is that the larger the size of a firm, the better its debt conditions. Smaller firms tend to suffer higher information asymmetry, while larger firms have better access to both external and internal funding, presenting a lower risk of default, and are generally more diversified (Diamond, 1984; Petersen and Rajan, 1994; Zou and Adams, 2008; Aldamen and Duncan, 2012).
When the dependent variables is the cost of debt (maturity), we consider maturity (cost of debt) as control variable. Both relationship between these two variables are possible. On the one hand, we can expect that the higher the percentage of long-term debt with respect to total debt, the greater maturity of the loans is associated with higher risk. Therefore, higher interest rates will be required to offset this increased risk (Jun and Jen, 2003; Bae and Goyal, 2009, Piot and Missonier-Piera, 2009). However, maturity could also be associated with less risk (Berger and Udell, 1990); hence, we can also expect a negative relationship between maturity and the cost of debt.

In addition to including the variables mentioned above, we also include the inflation rate in the estimations where the debt cost is the dependent variable. Inflation as measured by the consumer price index reflects the annual percentage change in the cost to the average consumer of acquiring a basket of goods and services that may be fixed or changed at specified intervals, such as yearly. The data are collected from the World Bank Database. The expected result is that the higher the inflation, the higher the cost of debt to provide lenders with real returns adjusted to the level of borrowers’ risk, and the shorter the debt maturity.

Table 1 shows the mean values of each formal and informal institutions for the different countries considered, as well as the values of the dependent variables, and the number of firms and observations. Table 2 presents the descriptive statistics for the firm-level variables.

[Insert Table 1 and Table 2]
We can appreciate that there is a wide variation in the average cost of debt between countries. The average cost of the total sample is 8.69%, while there are countries like Japan whose cost of debt is 2.15% and others like Brazil, Mexico, and South Africa for which it is higher than 13%. There is also a variation in the maturity structure, as the average maturity is 51.59%, while there are countries like Korea whose maturity is 33.33% and others like Norway and Ireland for which it is higher than 70%. These differences could be partly due to the influence of both formal and informal institutions. Countries such as Finland, Denmark, Norway, and Sweden stand out as having a high rule of law (around 1.9), while others like Pakistan, Indonesia, and Peru present very low values (around -0.7). As regard the protection of lenders and borrowers’ rights, countries like South Africa, Malaysia, Hong Kong, United Kingdom, Singapore, and New Zealand show a high level of this variable (10 points), whereas the degree of protection in Indonesia, Brazil, Italy, and Portugal is limited (only 3 points). As the variable of trust, Norway, Denmark, Sweden, and Finland, among others, have the highest values (higher than 60%), while Brazil, Philippines, and Malaysia present the lowest values (lower than 9%).

Table 3 presents the correlation matrix. C_DEBT (cost of debt) shows a negative correlation with rule of law and trust, but correlates positively with protection of creditors’ rights. MAT (maturity) present a positive correlation with rule of law, protection of creditors’ rights, and trust. In general, the correlations among firm-level variables are low.

[Insert Table 3]
4. RESULTS

4.1. Cost of debt and maturity: Formal and informal institutions, and economic development

The estimations were carried out using panel data. Prior to testing, we used the Breusch-Pagan test (Breusch and Pagan, 1980) to identify the existence of individual effects. The null hypothesis of no unobserved heterogeneity is rejected. In this context, a model that captures individual heterogeneity, as the panel data methodology does, is appropriate. The panel data methodology corrects for unobserved firm-specific and time-specific effects. The panel data estimation was calculated using fixed effects, as the test of Hausman (1978) rejects the null hypothesis of the lack of correlation between individual effects and observable variables in all regressions. We consider standard errors clustered by country and industry, and we included time effects in all estimations. All independent firm-level variables are lagged by one year to control for potential problems of endogeneity.

Table 4 presents the results from the panel data estimation. The dependent variable is the cost of debt. Column (1) show the results when considering firm-level determinants of the cost of debt, inflation, rule of law, protection of lenders and borrowers’ rights, and the interaction between the last two variables. The RULE_OF_LAW variable has a negative coefficient, indicating that firms in countries with strong legal enforcement have a lower cost of debt. The level of protection of lenders and borrowers’ rights (LEGAL_INDEX) is seen to have a negative influence on the cost of debt. Firms in countries with strong protection of creditors’ rights tend to issue debt at a lower cost. The effective protection of creditors’ rights could require not only that they are explicitly protected, but also that the degree of legal enforcement allows for the exercise of such rights. For this reason, we further considered the interaction between rule of law and protection of lenders and borrowers’ rights. An inverse relationship between this interaction and the cost of debt
indicates that it is not only necessary for lenders and borrowers to be protected by law, but also that the justice system needs to work efficiently if the rules are not obeyed, which ultimately leads to a reduction in the cost of debt. A direct relationship, on the other hand, would indicate that both legal enforcement and the protection of creditors’ rights are alternative mechanisms to reduce the cost of debt. Our results show that both strong legal enforcement and a high level of protection of lender and borrowers’ rights reduce the cost of debt. However, the joint presence of both variables would make this reduction lower.

[Insert Table 4]

Hence our results are in line with those obtained in the financial literature, which shown that firms in countries with an efficient judicial system and with stronger protection of lenders and borrowers’ rights will obtain debt in better conditions.

Column (2) of Table 4 shows the results when country trust is considered. Trust is seen to have a negative influence on the cost of debt. This result suggest that an increase in country trust improve debt conditions. The increased country trust could make that lenders need to spend less to protect themselves from counterparty risk. As a result of assuming less risk of default, lenders will be able to offer better credit conditions, in this case lower cost of debt. Hence the first hypothesis, which posits that more trusted environments lead to better debt conditions, is confirmed.

In column (3) of Table 4, we included both formal and informal institutions. The results are maintained: firms in countries with strong legal enforcement have a lower cost of debt, higher protection of creditor rights improves debt conditions, the joint presence of rule of law and protection of creditor rights mitigates the effect on the cost of debt (the reduction is lower), and higher levels of country trust reduce the cost of debt. Therefore, we can conclude that both formal and informal institutions decrease the cost of debt.
In column (4) of Table 4, we present the results showing the effect that formal and informal institutions have on the cost of debt, but in this case considering the degree of economic development. We use the natural logarithm variable GNI (Gross National Income) per capita from the World Bank Database to measure the economic development of each country, and we interact this variable with the main variables of our analysis (rule of law, legal index, and trust).

A potential problem when considering the degree of economic development is that this variable can itself be affected by the financial development. We resolve this question using instrumental variable estimations. We consider several variables as instruments of the degree of economic development. The proxies are market capitalization, weight of banks in economy, population, distance to the equator, and religion (Levine and Zervos, 1998; Barro and McCleary, 2003; Levine, 1999; Rodrik et al., 2004). Subsequently, we perform a Durbien-Wu-Hausman (DHW) test of overidentifying restrictions for each of the regressions. This test verifies the null hypothesis that the introduction of instrumental variables has no influence on the coefficients of the estimations. We hence perform a DWH F-test for each of the estimations in our paper, the results of which are reported in the bottom row of each table. When the p value of the F-test is below 10 percent, the null hypothesis is rejected and the instrumental variables estimations are reported. Otherwise, the estimations with the observed values of the degree economic development variable are provided.

Regarding the results, we obtain that higher degree of economic development reduce the cost of debt as the coefficient of GNI_PC variable is negative and statistically significant. Moreover, it is observed that both formal and informal institutions reduce the cost of debt

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8 The Appendix provides a description of the variables used as instruments of the degree of economic development variable.
when we do not take into account the degree of economic development, but this reduction is lower as the degree of economic development of a country increases. Hence, the third hypothesis, which posits that formal and informal institutions have a greater influence on debt conditions in countries with a lower degree of economic development, is confirmed. The results for the firm control variables shows that LEVERAGE is negatively related to the cost of debt. This means that leverage reflects the good reputations that companies have required in the debt markets, thus allowing an improvement in debt conditions. MATURITY is negatively related to the cost of debt, a result in agreement with those reported by Bharath et al. (2011), who also find a negative relationship between maturity and the cost of debt. This result is also in line with those reported by Berger and Udell (1990), who find that borrowers that are required to post collateral are also more likely to be paying higher spreads. The PROFITABILITY variable is negatively related to the cost of debt, result that is consistent with the idea that high economic profitability provides greater assurance to lenders. The SIZE variable has a negative influence on the cost of debt, reflecting the fact that larger firms have better access to external financing. INFLATION has a positive influence on the cost of indicating that in those countries where inflation is higher, lenders demands higher interest rates. The EBIT/INTEREST variable shows a positive coefficient, this result is contrary to expectations. TANGIBILITY is positive and not statistically significant.\(^9\)

The results reported in Table 4 are economically meaningful. For example, in terms of economic significance, the reported coefficients in column (3) suggest that a one-standard-deviation increase in RULE_OF_LAW or in TRUST is associated with a reduction in the cost of debt of 2.4 % and 0.81, respectively. We had also calculated the

\(^9\) We tested whether the most indebted firms had greater tangibility, as this could be the reason for a positive relationship between tangibility and the cost of debt. However, our results show that for both more indebted and less indebted firms, the relationship between tangibility and cost of debt remains positive.
economic effects for column (4), but in this case, considering only the observations for those countries which have a degree of economic development lower than the 25th percentile of the distribution. For those countries we observe that the effect of trust in the cost of debt is greater than the effect of rule of law: a one-standard-deviation increase in RULE_OF_LAW is associated with a 1.3% reduction in the cost of debt, while a one-standard-deviation in TRUST is associated with a 1.4% reduction. This effect reflect that informal institutions are more relevant in less developed countries, where formal institutions are weak.

Table 5 present the results when the dependent variable is maturity. Column (1) show the regression when considering firm-level determinants of the maturity, inflation, rule of law, protection of lender and borrowers’ rights, and the interaction between the last two variables. The results show that a higher degree of compliance imply longer maturity10. Column (2) shows the results when country trust is considered. Trust is positive, as expected, and statistically significant at the 1% level, reflecting that more trusting environments lead to longer debt maturity. In column (3) we include both formal and informal institutions, we obtain the same effects than in column (1) and (2) but in this case legal index and the interaction are statistically significant. Firms in countries with strong legal enforcement have longer maturity, higher protection of creditor rights also leads to less short-term debt, the joint presence of rule of law and protection of creditor rights mitigates the effect on maturity structure (the lengthening is lower), and higher level of country trust lengthen debt maturity. Hence, the first hypothesis, which posit that more trusted environments lead to longer maturity, is confirmed.

---

10 In this regression legal index and the interaction term are not statistically significant.
Based on the results of Tables 4 and 5, we can conclude that both formal and informal institutions lead to improvements in debt conditions (lower cost of debt and longer maturity).

[Insert Table 5]

In column (4) of Table 5, we present the results showing the effect of formal and informal institutions on the maturity structure, but in this case considering the degree of economic development. The results show that higher degree of economic development lead to longer maturity. As far as the institutions is concerned, we obtain that higher protection of creditor rights and higher country trust increases the maturity of debt, but this increase is lower as the degree of economic development increases.\(^\text{11}\)

Results for the firm control variables are in line with those obtained for the cost of debt, except for TANGIBILITY, that in this case is statistically significant, and it is found to have a positive influence on maturity, reflecting that tangible assets provide greater protection to lenders.\(^\text{12}\)

4.2. Cost of debt and maturity: the joint effect of formal and informal institutions

In Table 6, we present the results showing the joint effect that formal and informal institutions have on the cost of corporate debt (columns (1) and (2)) and on maturity structure (columns (3) and (4)).

[Insert Table 6]

In column (1) we interact country trust variable with rule of law, and in column (2) we include the interaction between trust, rule of law and protection of creditor rights. In both regressions, the results show a substitution effect of formal and informal institutions, as

\(^{11}\)In this regression rule of law is not statistically significant.

\(^{12}\)The SIZE variable has a positive influence on maturity, but it is not statistically significant.
we expected. This means that in countries where law enforcement and legal protection are weak, trust result more relevant in reducing the cost of debt. We obtain the same result when the dependent variable is maturity (columns (3) and (4)), as both formal and informal institutions increase maturity. However, the joint presence of these variables would make this increase lower\textsuperscript{13}. Hence the second hypothesis, which posits that formal and informal institutions act as substitutes in improving debt conditions, is confirmed.

5. CONCLUSIONS
This paper analyses the effect of formal and informal institutions on debt conditions for a sample of 21,790 non-financial firms from 37 countries over the period 2001-2012. When lending to a firm the lender must assess not only the credit quality of borrower but also the risk due to weak laws or institutions and the risk associated with less trusted societies. The higher the efficiency of the legal system of a country, the safer the country will be with regard to investing in it and hence lenders will be willing to offer credit on better conditions. On the other hand, the benefits of higher trust societies include less expenses associated with protecting individuals from being exploited in economic transactions, less covenants in written contracts or less litigation procedures, among others.

We provided evidence that both formal and informal institutions influence the cost of debt and maturity structure. Specifically, the results support the view that greater legal enforcement, efficient institutions and more trusted environments tend to improve debt conditions, reducing the cost of debt and increasing maturity.

We also analysed how formal and informal institutions influence debt conditions depending on the degree of economic development. Our results show that both formal

\textsuperscript{13} The coefficient of the interaction between trust and rule of law is not statistically significant.
and informal institutions play a more important role in developing countries, probably due to the existence of more asymmetric information in developing countries.

The paper also offers evidence regarding the joint effect of formal and informal institutions in affecting debt conditions. The results show a substitute effect between formal and informal institutions. In countries where law enforcement and legal protection are weak, trust result more relevant in improving debt conditions.

REFERENCES


Economic Studies, 51, 393-414.


## APPENDIX

### A.1. Proxies for trust

<table>
<thead>
<tr>
<th>VARIABLE</th>
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<td>Percentage of population belonging to a hierarchical religion</td>
<td>Percentage of population that are Roman Catholic, Eastern Orthodox or Muslim; measured during the early 1990s</td>
<td>La Porta et al. (1997)</td>
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<tr>
<td>Number of lawyers per million inhabitants</td>
<td>Number of lawyers divided by the population in millions</td>
<td>Population in millions in 2004 from World Development Indicators – World Bank (2008); number of lawyers is sourced from Council of Bars and Law Societies of Europe (CCBE) for the European countries (incl. Turkey), the American Bar Association for the USA, and various national and international organisations for the other countries</td>
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<td>Ethnolinguistic diversity</td>
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<td>GDP per capita</td>
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### A.2. Proxies for the degree of economic development

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<td>Weight of banks in the economy</td>
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<td>Percentage of population belonging to a hierarchical religion</td>
<td>Percentage of population that are Roman Catholic, Eastern Orthodox or Muslim; measured during the early 1990s</td>
<td>La Porta et al. (1997)</td>
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Table 1. Cost of debt, maturity, institutions, and trust: Descriptive statistics by country

This table reports the mean values of the dependent variables and country-level variables for each country. COST_OF_DEBT is the ratio between financial expenses and total debt. MATURITY is the ratio between long-term debt and total debt. RULE_OF_LAW is one of the six dimensions of the WGI and is a measure of the efficiency of the legal system. LEGAL_RIGHTS measures the protection of borrowers and lenders’ rights. TRUST is the percentage of individuals in a country who respond that most people can be trusted. GNI_PC is the natural logarithm of Gross National Income per capita.

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Table 2. Control variables: Descriptive statistics by country
This table reports the mean values of the firm-level variables for each country. LEVERAGE is the ratio between total debt and total assets. EBIT/INTEREST is the ratio between earnings before interest and taxes and interest. PROFITABILITY is the ratio between EBIT and total assets. TANGIBILITY is the ratio between tangible fixed assets and total assets. SIZE is the natural logarithm of sales (thousands). INFLATION is the rate of inflation.

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<th>EBIT/INTEREST</th>
<th>PROFITABILITY (%)</th>
<th>TANGIBILITY (%)</th>
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Mean 30.91 19.28 -2.31 31.92 4.85 2.87
Median 24.65 4.00 5.63 28.17 4.87 2.37
### Table 3. Correlations

This table presents the correlation matrix. COST_OF_DEBT is the ratio between financial expenses and total debt. MATURITY is the ratio between long-term debt and total debt. LEVERAGE is the ratio between total debt and total assets. EBIT/INTEREST is the ratio between earnings before interest and taxes and interest. PROFITABILITY is the ratio between EBIT and total assets. TANGIBILITY is the ratio between tangible fixed assets and total assets. SIZE is the natural logarithm of sales. INFLATION is the rate of inflation. RULE_OF_LAW is one of the six dimensions of the WGI and is a measure of the efficiency of the legal system. LEGAL_RIGHTS measures the protection of borrowers and lenders’ rights. TRUST is the percentage of individuals in a country who respond that most people can be trusted. ***, **, and * represent significance at the 1%, 5%, and 10% levels, respectively. GNI_PC is the natural logarithm of Gross National Income per capita.

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Table 4. Cost of debt, formal and informal institutions, and economic development

Regressions are estimated using panel data. The dependent variable (\text{COST\_OF\_DEBT}) is the ratio between financial expenses and total debt. LEVERAGE is the ratio between total debt and total assets. MATURITY is the ratio between long-term debt and total debt. EBIT/INTEREST is the ratio before interest and taxes and interest. PROFITABILITY is the ratio between EBIT and total assets. TANGIBILITY is the ratio between tangible fixed assets and total assets. SIZE is the natural logarithm of sales. INFLATION is the rate of inflation. RULE\_OF\_LAW is one of the six dimensions of the WGI and is a measure of the efficiency of the legal system. TRUST is the percentage of individuals in a country who respond that most people can be trusted. GNI\_PC is the natural logarithm of Gross National Income per capita. In computing standard errors, we cluster by country and industry. The Durbin-Wu-Hausman statistic tests the null hypothesis that the introduction of instrumental variables has no influence on the coefficients of the estimations. We report instrumental variable estimations if the test is significant at the 10% level. Year effects are included in all the estimations, although we do not report their coefficients. T-statistics are in parentheses. ***, **, and * represent significance at the 1%, 5%, and 10% levels, respectively.

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Regressions are estimated using panel data. The dependent variable (MATURITY) is the ratio between long-term debt and total debt. LEVERAGE is the ratio between total debt and total assets. COST_OF_DEBT is the ratio between financial expenses and total debt. EBIT/INTEREST is the ratio between earnings before interest and taxes and interest. PROFITABILITY is the ratio between EBIT and total assets. TANGIBILITY is the ratio between tangible fixed assets and total assets. SIZE is the natural logarithm of sales. INFLATION is the rate of inflation. RULE_OF_LAW is one of the six dimensions of the WGI and is a measure of the efficiency of the legal system. TRUST is the percentage of individuals in a country who respond that most people can be trusted. GN1_PC is the natural logarithm of Gross National Income per capita. In computing standard errors, we cluster by country and industry. The Durbin-Wu-Hausman statistic tests the null hypothesis that the introduction of instrumental variables has no influence on the coefficients of the estimations. We report instrumental variable estimations if the test is significant at the 10% level. Year effects are included in all the estimations, although we do not report their coefficients. T-statistics are in parentheses. ***, **, and * represent significance at the 1%, 5%, and 10% levels, respectively.

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Table 6. Cost of debt and maturity: joint effect of formal and informal institutions

Regressions are estimated using panel data. COST_OF_DEBT is the ratio between financial expenses and total debt. MATURITY is the ratio between long-term debt and total debt. LEVERAGE is the ratio between total debt and total assets. EBIT/INTEREST is the ratio between earnings before interest and taxes and interest. PROFITABILITY is the ratio between EBIT and total assets. TANGIBILITY is the ratio between tangible fixed assets and total assets. SIZE is the natural logarithm of sales. INFLATION is the rate of inflation. RULE_OF_LAW is one of the six dimensions of the WGI and is a measure of the efficiency of the legal system. TRUST is the percentage of individuals in a country who respond that most people can be trusted. In computing standard errors, we cluster by country and industry. The Durbin-Wu-Hausman statistic tests the null hypothesis that the introduction of instrumental variables has no influence on the coefficients of the estimations. We report instrumental variable estimations if the test is significant at the 10% level. Year effects are included in all the estimations, although we do not report their coefficients. T-statistics are in parentheses. ***, **, and * represent significance at the 1%, 5%, and 10% levels, respectively.

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<th>COST_OF_DEBT</th>
<th>MATURITY</th>
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