Debt Maturity and Financial Integration

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Abstract

This study applies the panel convergence methodology developed by Philips and Sul (2007) on the debt maturity ratios of a set of firms in developed economies, to explore the effects of credit market integration on debt maturity choices. In contrast to prior studies, our methodology allows for a formal quantification of the integration process. Therefore, we are able to track the evolution of integration over time and identify the conditions under which it is stronger. Firms that are able to integrate with international credit markets face a lower degree of informational asymmetries and have higher collateral value. Furthermore, as firms integrate with international credit markets, they extend their debt maturity. This evidence provides support to the argument that financial integration has a positive impact on firms, by facilitating access to long-term capital. On the contrary, firms not affected by credit market integration, experience a decrease in their debt maturity, as integration continues.

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1. Introduction

Since the mid-1980s, many countries around the world have implemented financial deregulation policies and have opened their domestic financial markets to foreign investors and financial institutions. This financial globalization process, i.e. the financial liberalization and the integration of countries with the international financial system, has greatly affected domestic financial systems around the world by increasing competition between financial intermediaries and giving firms the opportunity to expand their financing choices significantly.

The benefits and risks associated with financial globalization have been studied by the existing literature. Prior studies have documented that financial liberalization and integration decreases the cost of capital (e.g., Clarke et al, 2001; Chari and Henri, 2004) and boosts economic growth and private investment (e.g. Gruben and McLeod, 1998; Bosworth and Collins, 2000; Kumar and Pradhan, 2001). On the other hand, Jeanne (2003), McKinnon and Pill (1997), Mendoza and Quadrini (2010), among others, have shown that financial globalization has made the international financial system more vulnerable to crises, due to maturity and exchange rate mismatches and increased contagion risk.

It is often agued that among all types of international capital flows, the greatest risk stems from short-term flows, because they are very sensitive to herding behavior. Even small negative changes in market sentiment about a country can generate abrupt and large foreign capital outflows, creating costly liquidity runs for domestic borrowers (Chang and Velasco, 2000). Many empirical studies provide strong support to the argument that short-term flows are more unstable than long-term flows and more sensitive to negative shifts of market sentiment (Chuhan et al, 1996; Sarno and Taylor, 1999; Dadush et al, 2000). The higher the proportion of short-term funds flowing into a country, the higher is the risk of large capital flow reversals and liquidity runs suffered by domestic borrowers.

It becomes obvious that the maturity structure of the foreign capital flows is an important determinant for whether the recipient country will have net benefits from integrating with the word financial system. Thus motivated, we explore the effect of credit market integration on the maturity structure of firms operating in developed economies. There are different arguments concerning the financial integration effects on debt maturity. According to the first argument, firms that access international markets should experience a positive shift in their debt maturity, given that international markets are more developed and more liquid than

domestic markets and therefore facilitate long-term financing. According to another view, foreign creditors face informational disadvantages when lending to domestic borrowers and therefore prefer to lend short-term, in order to be able to discipline them.

Previous studies exploring the effect of financial integration on corporate debt maturity report mixed results. Schmukler and Vesperoni (2006) document that financial integration has a different impact on firms that access international debt and equity markets and on firms that rely only on domestic credit and equity markets. The former increase their long-term debt and extend their debt maturity, while the latter decrease their long-term debt and their debt maturity. Agca et al. (2007) show that increased credit market integration leads to longer debt maturity in developed countries and shorter debt maturity in developing countries. Lucey and Zhang (2011) report that the relationship between credit market integration and debt maturity is not clear.

Our paper belongs and contributes to this strand of literature. Our work differs from the aforementioned studies in a very significant aspect, namely the methodological approach. The classic method used in the existing literature for testing the integration process involves regressing debt maturity ratios on variables that proxy for the level of financial integration and domestic financial development/liberalization. The limitation of this method is that it cannot capture the dynamic component of the integration process. In particular, it does not quantify the integration process in a formal way and therefore it does not give an indication of how integration evolves over time and when integration is stronger.

Thus motivated, we address the aforementioned methodological issue by applying the panel convergence methodology developed by Philips and Sul (2007) on the debt maturity ratios of a set of firms. This methodology allows for visual inspection of the evolution of convergence over time and identifies two types of convergence, namely in levels and in rates. Convergence in rates means that the variable of interest has the same rate of change across different cross sectional units, while convergence in levels means that the variable of interest converges to the same value. This methodology also identifies convergent clubs, i.e. subgroups of convergent firms. We make the plausible assumption that, since integration affects in tandem all firms accessing international credit markets, firms that are involved in the process of integration should experience some form of convergence in their debt maturity ratios. Our strategy is as follows. After identifying convergent clubs, i.e. firms whose debt maturity ratio converges in levels or in rates, we test the relationship between the debt maturity ratios and the financial integration proxies for the constituent firms of each club.

We identify one big convergent (in rates) club, consisting of firms whose debt maturity is affected by the level of credit market integration. The rest of the firms in the sample are not affected by the level of credit market integration. Our results indicate that firms belonging to the club are subject to less informational asymmetries and have higher collateral value than the rest of the firms. More importantly, the debt maturity of the firms that belong to the big club increases with the level of credit market integration. This finding provides support to the argument that access to international markets alleviates financial constraints for firms and facilitates long-term financing. The debt maturity of the rest of the firms may not be sensitive to the level of integration, but it decreases as integration proceeds to higher levels. In addition, the maturity structure of the rest of the firms is affected to a larger extent by the development of the domestic banking system, compared to the maturity structure of the big club firms

The paper is organized as follows. Section 2 contains a brief literature review and also develops our main hypotheses. Section 3 refers to the panel convergence methodology developed by Phillips and Sul (2007). Section 4 describes the data that are used. Section 5 presents and discusses the results and Section 6 concludes.

2. Literature review and hypotheses development

During the last 30 years many countries encouraged foreign capital inflows by removing restrictions and controls on foreign investment, liberalizing domestic financial markets and making market-oriented reforms. This process of integration with the international financial system entails both costs and benefits for the countries involved. Financial integration may stimulate economic growth, boost domestic investment and lower the cost of capital. In addition to potential benefits, financial integration may also generate significant costs in terms of increased volatility of capital flows that makes countries, which are integrated with the international financial system, more vulnerable to financial crises.

Starting with the benefits, foreign capital inflows help the recipient country to raise the level of domestic investment and in turn the rate of economic growth. This happens through two channels. First, foreign capital inflows supplement domestic saving and thus increase the available capital for investment. Second, foreign investments may also involve the transfer of managerial and technological know-how, improving the skills of domestic labor force and

thereby raising productivity and competitiveness of the domestic economy (Borensztein et al, 1998). Studies testing the impact of international financial integration on investment and economic growth usually employ the level of foreign capital inflows as a proxy for the degree of integration (e.g. Gruben and McLeod, 1998; Bosworth and Collins, 2000; Kumar and Pradhan, 2001). According to their findings, the level of capital inflows has a positive impact on the level of domestic investment and the rate of GDP growth of the recipient country.

Another argument in favor of financial integration concerns the decline in the cost of capital. According to this view, the entry of foreign investors and financial institutions in the domestic financial system may create competitive pressures on domestic financial institutions and thereby mitigate or even eliminate excessive profits associated with oligopolistic financial market structures (Levine, 1996). Another similar argument is that the cost of capital is reduced because foreign financial institutions introduce advanced techniques in the financial intermediation process and therefore increase the efficiency of the domestic financial system. Empirical evidence provides support to the aforementioned arguments. Clarke et al (2001) study the impact of foreign bank penetration in 38 economies and find significant benefits for firms in terms of interest rate costs and availability of long-term loans. Chari and Henri (2004) find that firms that become investible for foreign investors, experience a significant positive stock price revaluation, which suggests a reduction in the cost of equity.

Turning to the potential costs, it is argued that short-term capital flows can be very unstable. In particular, a negative change in domestic economic fundamentals or in an international factor such as world interest rates can trigger sudden and massive capital outflows by foreign investors., creating the risk of a financial crisis. Even small shifts in market sentiment can generate significant withdrawals of foreign capital, especially by hedge funds and other investors with speculative trading investment style. The reason is that short-term flows are very sensitive to herding behavior due to asymmetric information problems. International investors and portfolio managers are often partially informed about the countries they invest in, so they prefer to hide in the herd, i.e. mimic the actions of the majority of other investors, in order to avoid criticism in both the good and the bad times. Besides, when a negative economic shock occurs in the recipient country, investors may not be able to fully understand the consequences and thus prefer to withdraw all of their capital. Chang and Velasco (2000) argue that sudden short-term capital outflows can create severe liquidity runs for borrowers.

Several empirical studies have examined the volatility of foreign capital flows. Their main conclusion is that there is a significant difference in the volatility of long-term and short-term flows, with the former being more stable than the latter. Chuhan et al (1996) find that short-term flows are more sensitive to turbulence in financial markets than long-term flows. Sarno and Taylor (1999) decompose different types of capital flows into permanent and cyclical components. They find that long-term flows have the highest permanent component of all other flows. Dadush et al (2000) find evidence implying that short-term flows are pro-cyclical over the business cycle, while medium-term and long-term flows are weakly counter-cyclical. This means that short-term flows decline in bad times and thus may exacerbate economic downturns. The same study documents that short-term inflows in Asian countries declined significantly during the Asian crisis in 1997-1998, while long-term flows remained stable.

The preceding discussion highlights that the time horizon of the foreign capital that flows into a country is very significant in determining whether the recipient country will have net benefits from financial integration or not. The higher the proportion of short-term funds, the higher the risk of large capital flow reversals and liquidity runs suffered by domestic borrowers. Thus motivated, we explore the effect of financial integration on the debt maturity of firms operating in developed countries. We use firm-level data instead of aggregate data, because they allow us to focus only on the firms that are able to integrate with the international financial system.

We study how access to international credit markets affects the debt structure of firms. There are two different arguments concerning this effect. According to the first approach, the debt maturity of firms that gain access to international credit markets will be prolonged, because international markets are more mature, more liquid and operate within a more developed legal and institutional environment than many domestic financial markets. As a consequence, access to international markets alleviates financial constraints and facilitates long-term financing (Clarke et al, 2001). Furthermore, domestic borrowing is also facilitated, since access in international markets is considered to be a credible signal by domestic lenders for the creditworthiness of the firm. According to the second approach, international investors often face informational disadvantages when investing in a foreign country. Therefore, they prefer to provide short-term instead of long-term financing, in order to be able to discipline the borrowers. Short-term is considered to be a discipline device that mitigates the risk that investors will be expropriated by

firms, because it has to be rolled over by firms frequently (Rodrik and Velasco, 2003). Hence, we test the following two hypotheses:

H1a: The debt maturity of firms is positively affected by the degree of credit market integration.
H1b: The debt maturity of firms is negatively affected by the degree of credit market integration.

The literature group that explores the effect of financial integration on the capital structure of firms using firm-level data is relatively young. Therefore, there is only a limited number of previous studies that examine the impact of equity and/or credit market integration on leverage ratios and debt maturity ratios of firms. Schmukler and Vesperoni (2006) study firms in 7 developing countries and document that financial integration has a different impact on firms that access international debt and equity markets and on firms that rely only on domestic credit and equity markets. The former increase their long-term debt and extend their debt maturity, while the latter decrease their long-term debt and their debt maturity. Mitton (2006) finds that firms whose stocks are available to foreign investors experience lower leverage. Agca et al. (2007) show that increased credit market integration leads to higher leverage and longer debt maturity in developed countries and to higher leverage but shorter debt maturity in developing countries. Lucey and Zhang (2011) studies the capital structure of firms in 24 developing countries and find that leverage is positively associated with credit market integration and negatively associated with equity market integration. They also report that the relationship between credit or equity market integration and debt maturity is not clear.

In sum, previous evidence about the impact of financial integration on debt maturity of firms is mixed. Our intention is to contribute to the clarification of this unsettled issue. As analyzed in the introduction of this study, the novelty of our study is that we employ a different methodology that has two advantages compared to previous studies. First, it is appropriate for detecting the firms that are mostly affected by financial integration. Second, it quantifies the integration process in a formal way and therefore gives an indication of how integration evolves over time and when integration is stronger.

3. Panel convergence methodology

We employ the methodology proposed by Phillips and Sul (2007) to test for debt maturity ratio convergence in a panel of firms. In essence, this methodology tests whether the dispersion across cross-sectional units of the variable of interest declines over time. Compared to other convergence tests, such as sigma or beta convergence tests, this one has the advantage of being more general in some aspects. No specific assumptions concerning the stationarity of the variable of interest or the existence of common factors are needed, while the methodology relies on a rather general form of a nonlinear time varying factor model.

Suppose we have a panel dataset and X_{it} is the parameter of interest, with $i=1,2,..N$ and $t=1,2,\ldots T$ denoting cross-sectional units and time periods respectively. The variable of interest is decomposed into a common component and an idiosyncratic component. Both of them are time varying. In the context of this test, convergence occurs when the idiosyncratic components across the cross-sectional units converge over time. The idiosyncratic/transitory component is estimated as:

$$\hat{h}_{it} = \frac{X_{it}}{\frac{1}{N}\sum_{i=1}^{N} X_{it}} \tag{1}$$

This estimated transition parameter for a specific cross-sectional unit at a specific time period is essentially the ratio of the variable value for the cross-sectional unit to the value of the cross-sectional average in the specific period. For example, suppose that $\hat{h}_{it}=1.2$; this implies that the variable value for the i_{th} cross-sectional unit in the t_{th} time period is 20% higher than the value of the cross-sectional average in that period. By plotting the transition parameters over time we get the transition curves, which allow us visual inspection of the convergence process. In particular, we have convergence when the transition curves move towards one. Transition parameters can be calculated for groups of cross-sectional units as well. The only difference is that the denominator is the average of the variable values of the cross-sectional units that comprise the group.

The next step in the methodology is to calculate the time-varying variance H_t of the transition parameter:

(2) $$H_t = \frac{1}{N}\sum_{i=1}^{N}(\hat{h}_{it} - 1)^2$$

As shown by Phillips and Sul, this has a limiting form of

(3) $$H_t \sim \frac{A}{L(t)^2 t^{2\alpha}} \text{ as } t \to \infty$$

where A is a positive constant, *L(t)* is a slowly varying function like *log(t+1)*, and *a* denotes the speed of convergence. It distinguishes between two convergence types. In particular, when $0 \leq \alpha < 1$, we have convergence in rates and when $\alpha \geq 1$, we have convergence in levels. The former means that the variable of interest has the same rate of change across different cross-sectional units, while the latter means that the variable of interest converges to the same value. The null hypothesis for the convergence in rates (level) is that $\alpha \geq 0$ ($\alpha \geq 1$), against the alternative that $\alpha < 0$ ($\alpha < 1$). Phillips and Sul test the null hypothesis using the following log*t* regression:

(4) $$\log\left(H_1 / H_t\right) - 2\log(t+1) = \hat{c} + \hat{b}\log t + u_t$$

The null hypothesis of convergence is rejected if $t_{\hat{b}} < -1.65$, where $t_{\hat{b}}$ is the t-statistic of the estimated $\hat{b}$ coefficient. The fitted coefficient of *logt* is $\hat{b} = 2\hat{\alpha}$, where $\hat{\alpha}$ is the estimate of α in the null hypothesis. Put simply, given statistical significance, values of $\hat{b}$ between 0 (included) and 2 imply convergence in rates, while values of $\hat{b}$ equal to or greater than 2 imply convergence in levels. Standard errors are heteroskedasticity and autocorrelation consistent (HAC)[2]. The data for this regression start at $t = [rT]$, where $[rT]$ is the integer part of rT and $r=0.3$, as suggested by Phillips and Sul.

Rejection of the null hypothesis of convergence for the full sample does not imply that there is no evidence of convergence in subgroups in the panel. Phillips and Sul extend their

[2]The Quadratic spectral kernel is employed and the bandwidth is determined by means of the Andrews (1991) data-dependent procedure.

methodology, in order to test for club convergence. They develop a four-step procedure. First, cross-sectional units are ordered according to their last observation in the panel. In the second step, the core convergent group is formed. To do so, we take the cross-sectional unit that was ranked first in Step 1 and run sequential log*t* regressions by adding further units one by one, based on the Step 1 ranking. The core convergent group is the one with the maximum t-statistic, provided of course that it is statistically significant, i.e. $t_b > -1.65$. In the third step, cross-sectional units not included in the core group are evaluated for membership of that group. One unit at a time is added to the core group and the t-statistic from the log*t* regression is calculated. A new unit qualifies for membership if the t-statistic of the associated log*t* regression is positive. In the end, we also check if the newly formed group – initial group plus the units that qualified – still satisfies the log*t* regression criterion for convergence. In the fourth step, all units that have not been included in the group identified in the previous steps are tested to see whether they formi a convergent group. If so, we conclude that our sample consists of two convergent subgroups/clubs. If not, we repeat Steps 1 to 3 on the units not included in the core group to determine whether there is a smaller group of convergent units. If no new group is detected, we conclude that the remaining units are divergent.

4. Data

Firm-level accounting data are collected from Worldscope, have an annual frequency and cover the period 1990-2010. Our dataset consists of public firms from 22 developed countries. Following previous research, financial firms (SIC 6000-6999) and utilities (SIC 4900-4999) are excluded. Variables are measured in constant 1983 dollars using the US CPI as a deflator. We winsorize all (final) accounting variables at the 1st and the 99th percentile to avoid the effect of outliers and misreported data.

Country-level variables, which are necessary for our analysis, are available from 1990 onwards. Financial system deposits (DEPOS) are demand, time and saving deposits in deposit money banks and other financial institutions, as a share of GDP. Total insurance premium (INS) is the sum of life and nonlife insurance premium volume as a share of GDP. International Debt Securities (INTDEBT) is the outstanding amount of bonds, notes and money market instruments placed in international markets, as a share of GDP. The Corruption Perception

Index (CORRUPT) measures the perceived levels of public sector corruption in each country. The original index is reversed, i.e. it ranges from 0 to 10, with larger values indicating more severe corruption. Data on DEPOS, INS and INTDEBT are collected from the Financial Structure Dataset of World Bank. Data on CORRUPT are collected from the Transparency International.

Depending on the required data for different types of analysis in the course of our study, the number of usable firm-year observations will vary accordingly.

5. Results

5.1. Convergence tests

Our first convergence test concerns the whole sample. In particular, we examine if the debt maturity ratios of al firms in our sample exhibit some form of convergence. Given that only a fraction of firms are able to integrate with international markets (Schmukler and Vesperoni, 2006) and that there is no other universal force that could generate convergence in debt structure across all firms from different countries, it is unlikely that we detect convergence in debt maturity ratios. As expected, the results of our full-sample convergence test indicate that there is no convergence detected when the whole sample is tested. As Table 1 indicates, the null hypothesis of convergence is rejected at the 1% level, since the t-statistic of $\hat{b}$ is -33.46, significantly lower than the critical value of -1.65.

Given the absence of convergence in the whole sample, we implement the club convergence algorithm to identify clubs of firms that satisfy the convergence criterion. If financial integration exerts a sufficiently strong influence – either positive or negative – on debt maturity ratios, then we expect this influence to become evident through the formation of a convergent club. Simply put, we expect that firms that are able to access international markets will form a convergent club, provided that the influence of financial integration on debt maturity ratios is significant and sufficiently strong. The results are presented in Table 2. There are 36 convergent clubs detected. There is one big club comprising of 965 firms and accounting for 77% of the sample. The rest of the detected clubs are relatively small ranging from 0.2% to 7.7% of the sample. The convergence within the big club happens in rates, i.e. debt maturity ratio has

the same rate of change across the firms belonging in the club. The divergent firms, i.e. firms that do not belong in any club, account for 1.4% of the sample.

The detection of a convergence club is not a sufficient finding, of course, for drawing any final conclusions about the impact of financial integration on firms. To establish that the formation of a convergent club is driven by financial integration forces, we need to make extra tests. In particular, we have to examine the sensitivity of corporate debt structure towards the level of financial integration across firms that belong in the club and firms that do not belong in a club. Such tests are conducted and discussed in the following subsections.

5.2. Is convergence driven by financial integration?

Our next goal is to examine if one of the detected clubs is formed due to financial integration forces. Our methodology is as follows. Suppose we want to test club X. We separate firms into those that belong to club X and those that do not and test how credit market integration affects the maturity ratios of the firms across the two groups. If the formation of club X is driven by financial integration, then we should find a significant association between debt maturity ratios and the level of financial integration only for the firms that belong to club X. Given that the detected big club accounts for the majority of the firms in the sample, it is our prime candidate for testing.

In order to assess the impact of integration on corporate debt structure, we regress debt maturity ratios of firms on the level of credit market integration. Two separate panel regressions are run, i.e. one for the firms that belong to the big club and one for the rest of the firms. To proxy for the level of credit market integration of each country, we use the outstanding amount of bonds, notes and money market instruments placed in international markets, as a share of GDP.

We also control for the development of the domestic financial system. In order to capture domestic financial system development, prior studies have used the amount of bank assets or the size and the turnover of stock and bond markets. As correctly pointed by Fan et al (2012), these variables raise endogeneity issues, since financial intermediaries may develop in ways that satisfy the needs of firms. Therefore, following Fan et al (2012), we use two variables that measure the supply of funds to financial intermediaries. Deposits as a share of GDP are used to capture the amount of funds that are available to the banking sector. Banks tend to have short-term liabilities and thus they may prefer to provide short-term credit. Therefore, we expect to

find a negative relationship between debt maturity ratios of firms and the development of the banking sector. The sum of life and nonlife insurance premium volume as a share of GDP is used to capture the amount of funds that are available to the insurance industry and the pension fund schemes respectively. Insurance companies and pension funds tend to have long-term liabilities and thus they may prefer to hold long-term assets. Therefore, we expect to find a positive relationship between debt maturity ratios of firms and the development of the industry and pension fund industry.

We also control for the integrity of the legal system in each country. We use the Corruption Perception Index, which measures the perceived levels of public sector corruption in each country. Creditors, in order to make a long-term commitment, require a legal system that can deter opportunistic behavior of borrowers and enforce compensation in case of violation. Therefore, we expect that debt maturity will be negatively associated with the level of public sector corruption.

Finally, we control for certain firm-specific characteristics, namely size and market-to-book ratio, which are expected to be correlated with debt structure. According to adverse selection models of capital structure (Flannery, 1986; Diamond 1993), asymmetric information between borrowers and lenders introduces a bias towards short-term debt. This happens because, when firms have favorable private information about their value and the creditors cannot distinguish between good and bad firms, the debt issued by the good firms will be underpriced. Since the pricing of long-term debt is more sensitive to changes in firm value than the pricing of short-term debt, the undepricing of long-term debt will be more severe. Therefore, higher levels of asymmetric information imply greater bias towards short-term debt. Given that the market has usually more information about large firms than for small firms, the undepricing will be less severe and thus larger firms are expected to use more long-term debt. Therefore, debt maturity is expected to be positively correlated with size. Another distortion induced by asymmetric information is the underinvestment problem. When firms are levered, the proceeds from undertaking future investments are split between shareholders and creditors. According to the underinvestment hypothesis (Myers, 1977), the presence of debt in the capital structure of a firm creates the risk that the firm will forgo positive net present value investments. Myers (1977) argues that sometimes, when firms are highly levered, the creditors extract enough of the future proceeds of a potential investment project, so that shareholders have no incentive to undertake it. According to Myers, short-term debt mitigates the risk of underinvestment and thus firms with

more growth opportunities will prefer short-term to long-term debt. Given that the market-to-book ratio proxies for the investment opportunity set of a firm, we expect that it will be negatively related to debt maturity.

The results of the regressions of debt maturity ratios on the level of credit market integration and all the aforementioned control variables are presented in Tables 5 and 6. Table 5 contains the results from the two separate regressions, i.e. one for the big club firms and one for the rest of the firms. We also test if the difference between the estimated coefficients across the two groups is statistically significant, by running one regression for the whole sample and incorporating an interaction variable that takes the value of one if a firm belongs to the big club and zero otherwise. The results are presented in Table 6. All regressions incorporate country, industry and year dummy variables to account for any country, industry or year-specific effect.

There is an array of important findings. First, as shown in Table 5, the financial integration variable is significant only for the big club firms. This implies that credit market integration affects the maturity structure of the firms that belong to the big club, and not the maturity structure of the rest of the firms. This result is robust even after controlling for firm-specific characteristics (columns 2a and 2b), the level of domestic financial system development (columns 3a and 3b) and the integrity of the domestic legal system (columns 4a and 4b). This finding provides strong support to the hypothesis that the detected convergence within the big club may be attributed to financial integration forces. In other words, results imply that the big club captures the firms that were able to access international credit markets.

Another important finding is that the detected relationship is positive, i.e. a higher level of integration is associated with more extended maturities. This finding is in line with hypothesis H1a, providing support to the argument that gaining access to international markets, which are usually more liquid and developed than domestic markets, alleviates financial constraints for domestic firms and allows them to obtain long-term financing more easily. Our results are consistent with previous findings of the literature. Demirgüç-Kunt and Maksimovic (1999) compare the financial structure of firms in developed and developing countries and find the greatest difference to be in the provision of long-term credit. In another paper, Demirgüç-Kunt and Maksimovic (1998) find that in countries whose legal and financial systems are developed, firms grow faster. More importantly, the authors show that this happens, because a developed financial and legal environment facilitates firms' access to long-term financing, i.e. long-term debt and equity. De la Torre and Schmukler (2005) show that the ability of a firm to obtain credit

under multiple jurisdictions is considered to be a credible signal by lenders for the creditworthiness of the firm. Therefore, such firms become more able to borrow long-term.

The positive relationship between integration and debt maturity does not support hypothesis H1b. The evidence is not consistent with the view that partially informed international investors will prefer to lend short-term to domestic firms in order to be able to discipline them. This is not surprising, given that our sample consists of firms from developed countries. Consequently, asymmetric information problems between foreign lenders and domestic borrowers may not be so severe to induce a shortening of the debt maturity. It should be noted though, that this result should be interpreted with caution. It does not necessarily imply that asymmetric information considerations are not in force when foreign lenders provide credit to domestic borrowers. Such problems may manifest themselves in other ways. For instance, lenders may not decide to lend short-term, but they still might prefer to lend only large firms, given that markets usually possess more information about large firms.

Turning to results concerning the firm-level variables, the coefficient for size, as shown in Table 5, is significant and has the expected positive sign across both groups and all different regression specifications. Consistent with the adverse selection models of capital structure (Flannery, 1986), it appears that larger firms have debt of longer maturity. We also find that, as predicted by the underinvestment hypothesis (Myers, 1977), debt maturity is negatively correlated with the market-to-book ratio. However, this applies only for the firms that belong in the big club. For the rest of the firms, there is not a significant relationship detected. Myers (1977) argues that the underinvestment problem is more likely to arise in highly levered firms. Hence, it is not surprising that the market-to-book ratio affects the debt structure of the big club firms and not the debt structure of the rest of the firms, because the former are on average more levered than the latter. Table 8 (columns (2) and (3)) presents evidence implying that big club firms are more levered than the rest of the firms. The results are from a Probit regression, where the dependent variable is a binary variable taking the value of one if the firm belongs to the big club and zero otherwise. The independent variable is corporate leverage. The estimated coefficient for leverage is positive and significant, indicating that the more levered the firm, the higher the probability that it will belong in the big club. This holds for both types of leverage, i.e. financial debt over assets and total liabilities over assets.

The next group of findings pertains to variables proxying for the development of domestic financial system. We find that, in both groups, the development of the banking sector is

associated with shorter maturities, while the development of the insurance/pension fund industry is associated with longer maturities (Table 5). This was expected, given that banks have relatively short-term investment horizon preferences, while insurance companies and pension funds have relatively long-term preferences. In addition, as shown in columns (3) and (4) in Table 6, the development of the banking sector has a stronger impact on the maturity structure of the firms that do not belong in the big club, indicating a more significant reliance of these firms on the domestic banking system. This finding provides extra support to the hypothesis that the big club consists of firms that have access to international markets. Firms with expanded financing resources will likely depend less on domestic banks.

Concerning the impact of the legal environment on debt structure, we find that higher levels of perceived corruption have a negative impact on debt maturity across both groups, as expected (columns (4a) and (4b) in Table 5). It appears that creditors provide more easily long-term debt within a more efficient legal environment.

Another factor that may have influenced corporate debt maturity is investors' demand for long-term bonds. The upward trend in bond prices during the last 30 years increased dramatically the demand for long-term bonds by speculative trading institutions like hedge funds. So, the observed shift to the long term in corporate debt maturity may be the result of increased demand for long-term bonds by speculators in credit markets. In order to test for this effect, we incorporate in our regression a variable that captures the increase in bond prices around the world. This variable is the annual returns of J.P. Morgan Global Aggregate Bond Index, which is the global investment grade debt benchmark for fixed-income investors. Results are presented in Table 7. The estimated coefficient is positive and significant for the firms in the big club, indicating that the rise in bond prices is positively correlated with corporate debt maturities. This implies that increased investors' demand has also influenced the choice of firms to issue long-term debt. Furthermore, the coefficient of the financial integration proxy is still positive and significant, indicating that the effect of financial integration on corporate debt maturity is robust even after controlling for speculators' demand.

5.3. Characteristics of firms that have access to international markets

Our preceding analysis provided evidence indicating that firms that belong to the big club are those that have access to international financing. Next, we explore the differences between these firms and the rest of the firms, in terms of firm-level characteristics. We conjecture that

firms with less informational asymmetries and higher collateral value will find it easier to tap international markets. We run a Probit regression, using as independent variables certain firm-specific variables, namely size, profitability, market-to-book ratio and tangibility. The dependent variable is a binary variable taking the value of one if the firm belongs to the big club and zero otherwise. Positive (negative) and significant estimated coefficients for any of the independent variables would imply that higher values of the underlying characteristic raise (lower) the probability that the firm will belong to the big club.

Results are presented in column (1) of Table 8. Firms that, according to our previous findings, have access to international markets are more likely to be larger, more profitable, to have lower market-to-book ratio and more tangible assets. The results make economic sense. Markets have more information about large firms. Profitability is an indication of the ability of the firm to generate internal resources. Market-to-book ratio is a proxy for growth opportunities. Firms, whose value is determined to a large extent from future growth opportunities, are usually more sensitive to asymmetric information problems compared to firms, whose value depends mostly on harvesting assets-in-place. Tangibility is a proxy for the available collateral of the firm. In sum, firms that can access foreign financing appear to face less informational asymmetries and have higher collateral values, compared to the rest of the firms.

5.4. Evolution of debt maturity ratios and the level of integration

We also calculate and plot the average cross-sectional debt maturity ratio for each year across the two groups and plot it on the same graph. As portrayed in Figure 1, the firms in the big club appear to have higher ratios on average throughout the whole sample period. Furthermore, the difference between the two groups widens from 1996 onwards. This pattern becomes more evident when we calculate and plot the relative transition curve for the big club. The relative transition curve is calculated every year as the ratio of the cross-sectional average maturity ratio of the big club firms to the cross-sectional average maturity ratio of all the firms in the sample. It measures the diversion between the maturity ratios of the two groups. A rising curve implies that the maturity ratios of the big club firms increase relative to the maturity ratios of the rest of the firms. The curve, depicted in Figure 2, is relatively flat until 1996 and rises henceforth. In order to test if the change indicated by the visual inspection of these graphs is significant, we regress the debt maturity ratio on a dummy variable that takes the value of one for observations in years 1996 to 2010 and zero otherwise. The regression is estimated separately for

each of the two groups. Table 9 presents the results. For the big club firms, the coefficient of the dummy variable is positive and significant, indicating that maturity ratios of the firms in the big club are higher after 1996. On the contrary, for the rest of the firms, the coefficient of the dummy variable is negative and significant, indicating that the maturity ratios of these firms are lower after 1996.

We also plot the relative transition curve together with curves that show the evolution of country-level variables (Figures 2 to 4). As shown in Figure 2, the relative transition curve of the big club tracks very closely the curve that depicts the evolution of outstanding amount of internationally issued debt securities as a share to GDP. This implies that the average debt maturity divergence of the firms that are able to integrate with international credit markets relative to the firms that are not, tracks very closely the level of financial integration. This is consistent with our previous results in subsection 5.3. that showed that only big club firms are affected by the level of financial integration. On the contrary, the relative transition curve does not track the evolution of financial system deposits (Figure 3) or total insurance premiums (Figure 4).

In sum, the analysis of the evolution of debt maturity ratios yields two results. First, as integration proceeds to higher levels, the debt maturity ratios of firms that integrate with international markets are prolonged. This corroborates the findings concerning the positive relationship between the maturity ratios and the level of integration reported in subsection 5.3. Second, firms that are not affected by integration, experience a shortening in their debt maturity ratios, as integration proceeds to higher levels.

5.5. Direct and indirect impact of financial integration on debt maturity

Prior studies (e.g. De Jong et al, 2008) that tested the effect of country-level determinants on debt-equity ratios have documented that, in addition to the direct effects, there are also indirect effects. Specifically, country-level variables change the way that firm-specific variables affect the debt-equity ratios of firms. For example, an improvement in creditor right protection mitigates asymmetric information problems between firms and creditors. As a result, the role of firm size as a proxy for informational asymmetries may be mitigated.

Thus motivated, we test if the level of financial integration influences the impact of firm-specific variables, i.e. size and market-to-book ratios, on debt maturity ratios. We follow the methodology of De Jong et al (2008). First we run a regression of debt maturity ratios on firm

size and market-to-book ratios. We only include the firms that belong to the big club, since the rest of the firms are not affected by the level of financial integration. We incorporate in the regression country dummies to capture cross-country differences:

$$MAT_{i,t} = \sum_{c=1}^{22} \alpha_c d_c + \sum_{c=1}^{22} \beta_{1c} d_c ASSETS_{i,t} + \sum_{c=1}^{22} \beta_{2c} d_c MB_{i,t} + \varepsilon_{i,t} \qquad (1)$$

$MAT_{i,t}$, $ASSETS_{i,t}$ and $MB_{i,t}$ are the debt maturity ratio, total assets and the market-to-book ratio, respectively of firm *i* in year *t*. d_c are country dummies and *c* denotes a country. Essentially, the coefficients estimated form this regression are equal to the coefficients we would obtain, if we run separate regressions for each of the 22 countries.

Next, we explore if the estimated coefficients for the countries are correlated with the level of financial integration of each country. Therefore we run three similar cross-sectional regressions:

$$\hat{\alpha}_c = \gamma_0 + \gamma_1 AVINTDEBT_c + \varepsilon_c \qquad (2)$$

$$\hat{\beta}_{1c} = \lambda_0 + \lambda_1 AVINTDEBT_c + \varepsilon_c \qquad (3)$$

$$\hat{\beta}_{2c} = \zeta_0 + \zeta_1 AVINTDEBT_c + \varepsilon_c \qquad (4)$$

Equation (2) is estimated by a Weighted Least Squares regression of country dummy coefficients $(\hat{\alpha}_c)$ estimated from equation (1) against the average level of financial integration (AVINTDEBT) for each country during the sample period. The weights are the inverse standard errors of the corresponding country dummy coefficients, estimated from equation (1). These weights allow us to take into account the statistical significance of the related variables. In essence, the estimated dummy coefficients are a proxy for the level of debt maturity ratios of each country's firms after controlling for firm-specific effects. So, equation (2) captures the direct effects of financial integration on debt maturity. Hence, given our previous results, we expect to find a positive correlation between dummy coefficients and the level of financial integration of each country.

Equation (3) is a Weighted Least Squares regression of size coefficients $(\hat{\beta}_{1c})$ estimated from equation (1) against the average level of financial integration (AVINTDEBT) for each

country. The weights are the inverse standard errors of the corresponding size coefficients, estimated from equation (1). With this regression we estimate the indirect impact of financial integration on debt maturity, via a firm-level determinant, i.e. size

Equation (4) is a Weighted Least Squares regression of market-to-book ratio coefficients $(\hat{\beta}_{2c})$ estimated from equation (1) against the average level of financial integration (AVINTDEBT) for each country. The weights are the inverse standard errors of the corresponding market-to-book ratio coefficients, estimated from equation (1). With this regression we estimate the indirect impact of financial integration on debt maturity, via a firm-level determinant, i.e. market-to-book ratio.

The results are presented in Table 10. Starting with regression (2), the coefficient of the level of financial integration is positive and significant, indicating that the direct impact of financial integration on corporate debt maturity is positive. In countries that firms are on average more integrated with international markets, corporate debt maturity is longer. This result is consistent with our preceding results in this study. In regression (3) the coefficient for the level for financial integration is positive and significant. This means that, in countries that firms are more integrated with the financial system, the coefficient for size is higher. Given that size is positively related to debt maturity, this result implies that the impact of size is reinforced with higher levels of financial integration. The results from regression (4) point to the same direction. The coefficient for financial integration is negative and significant. This means that in countries that firms are more integrated with international markets, the coefficient for market-to-book ratios is lower. Since the market-to-book ratio is negatively related to debt maturity, this result implies that the effect of market-to-book ratio is reinforced with higher levels of financial integration.

Our analysis showed that the magnitude of size and market-to-book ratio as determinants of corporate debt maturity is higher when firms integrate with international markets. Since both variables proxy for informational asymmetries between firms and creditors, one possible explanation for our finding could be that potential informational disadvantages of international investors may manifest themselves through the reinforcement of firm-level determinants. Foreign creditors, being aware that they are partially informed when approaching domestic borrowers, may be biased towards safer firms when providing long-term debt, i.e. towards larger firms and firms whose value depends more on assets-in-place and less on uncertain future investments. In

that case, it appears that from all the firms that are able to tap international markets and access long-term finance, large firms and firms with more assets-in-place are those that benefit the most.

6. Conclusions

In this paper, we apply the panel convergence methodology developed by Philips and Sul (2007) on the debt maturity ratios of a set of firms in developed economies, to explore the effects of credit market integration on debt maturity choices. In contrast to prior studies, our methodology allows for a formal quantification of the integration process. Therefore, we are able to track the evolution of integration over time and identify the conditions under which it is stronger.

Our analysis yields three main findings. First, firms that are able to integrate with international credit markets, face on average a lower degree of informational asymmetries and have higher collateral value. Second, as firms integrate with international credit markets, they extend their debt maturity. Finally, firms not affected by credit market integration, experience a decrease in their debt maturity, as integration continues.

Our results provide support to the argument that financial integration has a positive impact on firms by facilitating access to long-term capital. We also find that this effect is stronger for large firms and firms whose value depends more on assets-in-place and less on uncertain future investments. This finding is consistent with the view that foreign investors, being aware that they are partially informed when approaching domestic borrowers, are less reluctant to provide long-term financing to firms, for which the markets possess more information.

An interesting question arises from our third result: why do firms that do not integrate with international markets experience a shortening in their debt maturity, as integration continues? One possible explanation that has been proposed in prior literature[3] relies on a "crowding in" effect. After some firms obtain financing globally, more funds are available domestically. Therefore, firms that were previously shut out of the credit market, may now be able to obtain credit in the domestic market. However, the lack of reputation for the

[3] Schmukler and Vesperoni (2006) report a similar result. The find that domestic-only-financed firms experience a shortening of their debt maturity structure with financial liberalization.

"newcomers" may lead creditors to lend short-term, to better monitor and discipline borrowers. This is certainly an interesting topic for future research.

References

Agca, S., De Nicolò, G., Detragiache, E., 2007. Financial reforms, financial openness, and corporate borrowing: international evidence. Working paper 07/186, IMF.

Barclay, M.J., Smith, C.W., 1995. The maturity structure of corporate debt. Journal of Finance 50, 609–631.

Borensztein, E., J. De Gregorio and J. Wha Lee, 1998. 'How Does Foreign Direct Investment Affect Economic Growth?, Journal of International Economics, 45, 115–135.

Bosworth, B. P. and S. M. Collins, 2000, Capital Flows to Developing Economies: Implications for Saving and Investment, Brookings Papers on Economic Activity, 1, 143–80.

Chari, A., Henry, P.B., 2004. Risk sharing and asset prices: evidence from a natural experiment. Journal of Finance 59, 1295–1324.

Chuhan, P., G. Perez-Quiros and H. Popper, 1996, International Capital Flows: Do Short-Term Investment and Direct Investment Differ?, PRE Working Paper No. 1669, World Bank.

Clarke, G., R. Cull and M. S. Martinez Peria, 2001, Does Foreign Bank Penetration Reduce Access to Credit in Developing Countries? Evidence from Asking Borrowers,' Policy Research Working Paper No. 2716.

Dadush, U., D. Dasgupta and D. Ratha, 2000, The Role of Short-term Debt in Recent Crises, Finance and Development, 37, 54–57.

De la Torre, A., and Schmukler, S., 2005, Coping with risks through mismatches: domestic and international financial contracts for emerging economies, International Finance 7 (3), 1 –42.

De Jong, A., R. Kabir and Nguyen, T., 2008, Capital structure around the world: The roles of firm- and country-specific variables, Journal of Banking and Finance, 32, 1954-1969.

Demirguc-Kunt, A., and V. Maksimovic, 1998. Law, Finance and Firm Growth. Journal of Finance, 53, 2107-2137.

Demirguc-Kunt, A., Maksimovic, V., 1999. Institutions, financial markets and firm debt maturity. Journal of Financial Economics 54, 295–336.

Diamond, D., 1993, Seniority and maturity of debt contracts, Journal of Financial Economics 33, 341-368.

Doidge, C., Karolyi, A., Stulz, R., 2004. Why are foreign firms that list in the U.S. worth more? Journal of Financial Economics 71, 205–238.

Fan, J., Titman, S., Twite, G., 2012. An International Comparison of Capital Structure and Debt Maturity Choices. Journal of Financial and Quantitative Analysis, forthcoming.

Flannery, M., 1986, Asymmetric information and risky debt maturity choice, Journal of Finance 41, 18-38.

Gruben, W. C. and D. McLeod, 1998, Capital Flows, Savings, and Growth in the 1990s. Quarterly Review of Economics and Finance, 38, 287–301.

Henry, P., 2000a. Stock market liberalization, economic reform, and emerging market equity prices. Journal of Finance 55, 529– 564.

Jeanne, O., 2003. Why do emerging market countries borrow in foreign currency? IMF Working Paper 03/177.

Levine, R., 1996, Foreign Banks, Financial Development, and Economic Growth, in C. E. Barfield (ed.), International Financial Markets (American Enterprise Institute Press, Washington DC).

Lucey, B.M., Zhang., Q., 2010. Financial integration and emerging markets capital structure. Journal of Banking and Finance 35, 1228–1238.

McKinnon, R., Pill, H., 1997. Credible economic liberalizations and over-borrowing. American Economic Review 87, 189– 193.

Mendoza, E., Quadrini, V. Financial globalization, financial crises and contagion. Journal of Monetary Economics 57, 24 - 39.

Mitton, T., 2006. Stock market liberalization and operating performance at the firm level. Journal of Financial Economics 81, 625–647.

Myers, S., 1977, Determinants of corporate borrowing, Journal of Financial Economics 5, 147-175.

Phillips, P. C. B. & Sul D., 2007, "Transition Modeling and Econometric Convergence Tests", Econometrica, 75(6), pp. 1771-1855.

Sarno, L. and M. P. Taylor, 1999, Hot Money, Accounting Labels and the Permanence of Capital Flows to Developing Countries: An Empirical Investigation, Journal of Development Economics, 59, 337– 364.

Schmukler, S.L., Vesperoni, E., 2006. Financial globalization and debt maturity in emerging economies. Journal of Development Economics 79, 183–207.

Stulz, R., 1999. Globalization, corporate finance and the cost of capital. Journal of Applied Corporate Finance 12, 8–25.

TABLE 1

Descriptive statistics of firm-level variables

	MAT	LEV	TOTAL LEV	ASSETS	PROF	MB	TANG	N
Australia	0.711	0.254	0.510	6.918	0.044	1.431	0.433	105
Austria	0.667	0.194	0.638	9.272	0.060	1.170	0.517	21
Belgium	0.535	0.242	0.619	6.322	0.055	1.304	0.354	252
Canada	0.468	0.277	0.501	5.949	0.098	1.263	0.389	126
Chile	0.450	0.226	0.457	6.527	0.103	1.575	0.542	84
Denmark	0.581	0.252	0.532	6.247	0.054	1.329	0.320	336
Finland	0.674	0.317	0.573	7.026	0.061	1.370	0.348	189
France	0.514	0.209	0.579	7.081	0.064	1.318	0.235	987
Germany	0.523	0.221	0.638	7.342	0.043	1.410	0.309	882
Greece	0.618	0.272	0.506	6.802	0.106	1.791	0.465	42
Ireland	0.632	0.286	0.559	5.541	0.073	1.171	0.413	63
Italy	0.471	0.254	0.615	7.208	0.028	1.172	0.285	483
Japan	0.448	0.280	0.599	7.218	0.039	1.206	0.314	11,970
Korea	0.463	0.406	0.654	7.930	0.063	1.021	0.428	525
Mexico	0.703	0.340	0.521	8.595	0.103	1.250	0.603	63
Netherlands	0.606	0.247	0.652	7.317	0.080	1.455	0.354	273
Portugal	0.484	0.344	0.676	6.664	0.004	1.147	0.317	84
Spain	0.504	0.249	0.559	7.460	0.064	1.366	0.408	252
Sweden	0.533	0.239	0.621	8.125	0.069	1.319	0.346	210
Switzerland	0.581	0.237	0.558	6.734	0.058	1.294	0.293	378
United Kingdom	0.498	0.193	0.561	6.263	0.088	1.481	0.331	1,113
United States	0.806	0.245	0.546	7.613	0.105	1.742	0.341	7,875
All countries	0.575	0.261	0.581	7.279	0.064	1.398	0.326	26,313

This table provides the mean of firm-level variables during the period 1990-2010. MAT is long-term debt divided by total debt. LEV is total debt divided by total assets. TOTAL LEV is total liabilities divided by total assets. ASSETS is the natural log of book assets expressed in 1983 US dollars. PROF is operating income divided by total assets. MB is total assets minus total shareholder equity plus market value of equity divided by total assets. TANG is net fixed assets divided by total assets. Data for all firm-level variables are collected from Worldscope. N is firm-year observations.

TABLE 2

Descriptive statistics of country-level variables

	DEPOS	INS	INTDEBT	CORRUPT
Australia	0.654	0.081	0.331	1.397
Austria	0.830	0.056	0.461	2.218
Belgium	0.793	0.080	0.553	3.156
Canada	0.994	0.067	0.284	1.135
Chile	0.411	0.036	0.053	3.125
Denmark	0.546	0.069	0.222	0.562
Finland	0.498	0.079	0.372	0.611
France	0.625	0.087	0.270	3.012
Germany	0.813	0.064	0.410	2.056
Greece	0.630	0.018	0.281	5.445
Ireland	0.750	0.122	0.660	2.272
Italy	0.549	0.053	0.241	5.414
Japan	1.959	0.106	0.077	2.969
Korea	0.677	0.115	0.082	5.511
Mexico	0.226	0.016	0.142	6.809
Netherlands	0.911	0.094	0.684	1.120
Portugal	0.883	0.056	0.382	3.781
Spain	0.809	0.051	0.393	3.856
Sweden	0.446	0.063	0.423	0.846
Switzerland	1.431	0.107	0.404	1.146
United Kingdom	0.987	0.136	0.414	1.636
United States	0.658	0.088	0.176	2.451
All countries	1.284	0.096	0.173	2.723
N	24,830	24,962	25,060	23,807

This table provides the mean of country-level variables during the period 1990-2010. DEPOS is total financial system deposits, i.e. demand, time and saving deposits in deposit money banks and other financial institutions, as a share of GDP. INS is total, i.e. life and nonlife, insurance premium volume as a share of GDP. INTDEBT is International Debt Securities (Amt Outstanding), i.e. bonds, notes and money market instruments placed in international markets, as a share of GDP. CORRUPT is the Corruption Perception Index, which measures the perceived levels of public sector corruption in each country. The original index is reversed, i.e. it ranges from 0 to 10, with larger values indicating more severe corruption. Data on DEPOS, INS and INTDEBT are collected from Financial Structure Dataset of World Bank. Data on CORRUPT are collected from the Transparency International. N is firm-year observations.

TABLE 3

Full-sample convergence test

Equation (A): $\log\left(H_1/H_t\right) - 2\log(t+1) = c + b\log t + \varepsilon_t$

Variable of interest	$\hat{b}$
MAT (Debt maturity)	-0.880*** *-33.46*
N	26,313

This table provides the regression results of testing for debt maturity convergence across all firms of the sample. The null hypothesis of convergence is rejected if $t_{\hat{b}} < -1.65$, where $t_{\hat{b}}$ is the t-statistic of the estimated coefficient $\hat{b}$. MAT (Debt maturity) is long-term debt divided by total debt. N is firm-year observations. Numbers in italics are t-statistics. ***, ** and * indicate 1%, 5% and 10% statistical significance levels, respectively.

TABLE 4

Convergent clubs

Number of convergent clubs	Type of convergence	Number of firms in each club	Number of firms in each club / number of all firms in the sample
1	In rates	965	77.0%
35	In levels/In rates	2 to 97	0.2% to 7.7%
Divergent firms	-	18	1.4%
All firms	-	1,253	100.0%

This table provides information about the structure of the detected convergent clubs. Convergence in rates means that the variable of interest has the same rate of change across the cross-sectional units, while convergence in levels means that it converges to the same value. Divergent firms are firms that do not belong in any convergent club.

TABLE 5

Determinants of debt maturity

Equation (A): $Y_{i,t} = a_c + a_t + a_s + b_1 X_{i,t} + b_2 Z_{c,t} + \varepsilon_{i,t}$

	Big club firms	Rest of the firms	Big club firms	Rest of the firms	Big club firms	Rest of the firms	Big club firms	Rest of the firms
	(1a)	(1b)	(2a)	(2b)	(3a)	(3b)	(4a)	(4b)
Fin. integration variable								
INTDEBT	0.156***	-0.011	0.148***	-0.021	0.154***	0.042	0.142***	0.043
	8.29	*-0.30*	*7.76*	*-0.59*	*5.90*	*0.75*	*5.47*	*0.78*
Firm-level variables								
ASSETS			0.017***	0.029***	0.016***	0.029***	0.017***	0.028***
			5.88	*4.00*	*5.88*	*4.08*	*6.19*	*3.92*
MB			-0.028***	-0.003	-0.029***	-0.009	-0.030***	-0.009
			-5.72	*-0.24*	*-5.90*	*-0.74*	*-6.30*	*-0.77*
Country-level variables								
DEPOS					-0.085***	-0.231***	-0.036	-0.163***
					-4.08	*-5.36*	*-1.43*	*-3.10*
INS					0.894***	1.720***	0.490**	1.301***
					3.89	*3.50*	*2.10*	*2.69*
CORRUPT							-0.020***	-0.036**
							-2.93	*-2.36*
Adj. R^2	0.371	0.282	0.383	0.295	0.383	0.303	0.402	0.302
N	19,300	5,760	19,300	5,760	19,030	5,702	17,100	5,126

This table reports the results from estimating equation (A) via OLS regressions. The dependent variable Y is MAT, i.e. long-term debt divided by total debt. α_c, α_t and α_s denote country, year and industry dummy variables, respectively. X is a vector of firm-level variables, namely ASSETS and MB. ASSETS is the natural log of book assets expressed in 1983 US dollars. MB is total assets minus total shareholder equity plus market value of equity divided by total assets. Z is a vector of country-level variables, namely INTDEBT, DEPOS, INS and CORRUPT. INTDEBT is International Debt Securities (Amt Outstanding), i.e. bonds, notes and money market instruments placed in international markets, as a share of GDP. DEPOS is total financial system deposits, i.e. demand, time and saving deposits in deposit money banks and other financial institutions, as a share of GDP. INS is total, i.e. life and nonlife, insurance premium volume as a share of GDP. CORRUPT is the Corruption Perception Index, which measures the perceived levels of public sector corruption in each country. The original index is reversed, i.e. it ranges from 0 to 10, with larger values indicating more severe corruption. Standard errors (clustered by firm)) are robust to heteroskedasticity and to residual dependence within firms. N is firm-year observations. Country, year and industry dummy variable estimates are not reported for brevity. Numbers in italics are t-statistics. ***, ** and * indicate 1%, 5% and 10% statistical significance levels, respectively.

TABLE 6

Determinants of debt maturity: differences across convergent clubs

Equation (A): $Y_{i,t} = a_c + a_t + a_s + b_1 X_{i,t} + b_2 Z_{c,t} + \varepsilon_{i,t}$

	(1)	(2)	(3)	(4)
Fin. integration variable				
INTDEBT*D_CLUB	0.167***	0.169***	0.112*	0.099*
	4.206	*4.207*	*1.869*	*1.653*
Firm-level variables				
ASSETS*D_CLUB		-0.012	-0.013*	-0.011
		-1.585	*-1.672*	*-1.447*
MB*D_CLUB		-0.025**	-0.020	-0.021*
		-2.023	*-1.610*	*-1.754*
Country-level variables				
DEPOS*D_CLUB			0.146***	0.127**
			3.172	*2.258*
INS*D_CLUB			-0.826	-0.811
			-1.591	*-1.558*
CORRUPT*D_CLUB				0.016
				0.995
Adj. R^2	0.434	0.444	0.447	0.468
N	25,060	25,060	24,732	22,226

This table reports the results from estimating equation (A) with interaction terms for club membership via OLS regressions. The interaction indicator D_CLUB is a dummy variable equal to one if the firm belongs in the big club and zero otherwise. The dependent variable Y is MAT, i.e. long-term debt divided by total debt. α_c, α_t and α_s denote country, year and industry dummy variables, respectively. X is a vector of firm-level variables, namely ASSETS and MB. ASSETS is the natural log of book assets expressed in 1983 US dollars. MB is total assets minus total shareholder equity plus market value of equity divided by total assets. Z is a vector of country-level variables, namely INTDEBT, DEPOS, INS and CORRUPT. INTDEBT is International Debt Securities (Amt Outstanding), i.e. bonds, notes and money market instruments placed in international markets, as a share of GDP. DEPOS is total financial system deposits, i.e. demand, time and saving deposits in deposit money banks and other financial institutions, as a share of GDP. INS is total, i.e. life and nonlife, insurance premium volume as a share of GDP. CORRUPT is the Corruption Perception Index, which measures the perceived levels of public sector corruption in each country. The original index is reversed, i.e. it ranges from 0 to 10, with larger values indicating more severe corruption. Standard errors (clustered by firm) are robust to heteroskedasticity and to residual dependence within firms. N is firm-year observations. For brevity, we only report the coefficient estimates of the interaction terms. Numbers in italics are t-statistics. ***, ** and * indicate 1%, 5% and 10% statistical significance levels, respectively.

TABLE 7

Determinants of debt maturity: incorporating investor demand

Equation (A): $Y_{i,t} = a_c + a_t + a_s + b_1 R_t + b_2 X_{i,t} + b_3 Z_{c,t} + \varepsilon_{i,t}$

	Big club firms	Rest of the firms	Big club firms	Rest of the firms	Big club firms	Rest of the firms	Big club firms	Rest of the firms
	(1a)	(1b)	(2a)	(2b)	(3a)	(3b)	(4a)	(4b)
Fin. integration variable								
INTDEBT	0.156***	-0.011	0.148***	-0.021	0.154***	0.042	0.142***	0.043
	8.29	*-0.30*	*7.76*	*-0.59*	*5.90*	*0.75*	*5.47*	*0.78*
Investor demand variable								
BOND_RET	0.081***	-0.017	0.066***	-0.042*	0.074***	-0.033	0.057**	-0.074**
	3.59	*-0.73*	*2.92*	*-1.78*	*3.30*	*-1.41*	*2.53*	*-2.56*
Firm-level variables								
ASSETS			0.017***	0.029***	0.016***	0.029***	0.017***	0.028***
			5.88	*4.00*	*5.88*	*4.08*	*6.19*	*3.92*
MB			-0.028***	-0.003	-0.029***	-0.009	-0.030***	-0.009
			-5.72	*-0.24*	*-5.89*	*-0.74*	*-6.30*	*-0.77*
Country-level variables								
DEPOS					-0.085***	-0.231***	-0.036	-0.163***
					-4.08	*-5.36*	*-1.43*	*-3.10*
INS					0.894***	1.720***	0.490**	1.301***
					3.89	*3.50*	*2.10*	*2.69*
CORRUPT							-0.020***	-0.036**
							-2.93	*-2.36*

Adj. R^2	0.375	0.289	0.386	0.303	0.385	0.310	0.404	0.310
N	19,300	5,760	19,300	5,760	19,030	5,702	17,100	5,126

This table reports the results from estimating equation (A) via OLS regressions. The dependent variable Y is MAT, i.e. long-term debt divided by total debt. α_c, α_t and α_s denote country, year and industry dummy variables, respectively. R stands for BOND_RET and is the annual returns of the J.P. Morgan Global Aggregate Bond Index. X is a vector of firm-level variables, namely ASSETS and MB. ASSETS is the natural log of book assets expressed in 1983 US dollars. MB is total assets minus total shareholder equity plus market value of equity divided by total assets. Z is a vector of country-level variables, namely INTDEBT, DEPOS, INS and CORRUPT. INTDEBT is International Debt Securities (Amt Outstanding), i.e. bonds, notes and money market instruments placed in international markets, as a share of GDP. DEPOS is total financial system deposits, i.e. demand, time and saving deposits in deposit money banks and other financial institutions, as a share of GDP. INS is total, i.e. life and nonlife, insurance premium volume as a share of GDP. CORRUPT is the Corruption Perception Index, which measures the perceived levels of public sector corruption in each country. The original index is reversed, i.e. it ranges from 0 to 10, with larger values indicating more severe corruption. Standard errors (clustered by firm)) are robust to heteroskedasticity and to residual dependence within firms. N is firm-year observations. Country, year and industry dummy variable estimates are not reported for brevity. Numbers in italics are t-statistics. ***, ** and * indicate 1%, 5% and 10% statistical significance levels, respectively.

TABLE 8

Firm-level characteristics across convergent clubs

Equation (A): $Y_{i,t} = a_c + a_t + a_s + bX_{i,t} + \varepsilon_{i,t}$

	(1)	(2)	(3)
ASSETS	0.529***		
	42.51		
MB	-0.138***		
	-4.25		
PROF	1.941***		
	4.78		
TANG	1.939***		
	14.32		
LEV		3.297***	
		25.37	
TOTAL LEV			2.637***
			24.35
N	26,313	26,313	26,313

This table reports the results from estimating equation (A) via logit regressions. Y is a binary variable taking the value 1 if the firm belongs in the big club and 0 otherwise. α_c, α_t and α_s denote country, year and industry dummy variables, respectively. X is a vector of firm-level variables, namely LEV, TOTAL LEV, ASSETS, PROF, MB and TANG. LEV is total debt divided by total assets. TOTAL LEV is total liabilities divided by total assets. ASSETS is the natural log of book assets expressed in 1983 US dollars. PROF is operating income divided by total assets. MB is total assets minus total shareholder equity plus market value of equity divided by total assets. TANG is net fixed assets divided by total assets. Standard errors are robust to heteroskedasticity using the Huber/White estimator. N is firm-year observations. Country, year and industry dummy variable estimates are not reported for brevity. Numbers in italics are z-statistics. ***, ** and * indicate 1%, 5% and 10% statistical significance levels, respectively.

TABLE 9

Debt maturity ratio before and after 1996

Equation (A): $Y_{i,t} = a_c + a_t + a_s + d\_96 + bX_{i,t} + \varepsilon_{i,t}$

	Big club firms	Rest of the firms	Big club firms	Rest of the firms
D_96	0.581***	-0.233***	0.474***	-0.243***
	4.46	*-11.49*	*3.98*	*-11.96*
ASSETS			0.018***	0.029***
			34.87	*4.37*
MB			-5.555***	-0.005
			-3.23	*-0.62*
N	20,265	6,048	20,265	6,048

This table reports the results from estimating equation (A) via OLS regressions. Y is MAT, i.e. long-term debt divided by total debt. α_c, α_t and α_s denote country, year and industry dummy variables, respectively. D_96 is a dummy variable taking the value 1 for observations in years 1996 to 2010 and 0 otherwise. X is a vector of firm-level variables, namely ASSETS and MB. ASSETS is the natural log of book assets expressed in 1983 US dollars. MB is total assets minus total shareholder equity plus market value of equity divided by total assets. Standard errors (clustered by firm) are robust to heteroskedasticity and to residual dependence within firms. N is firm-year observations. Country, year and industry dummy variable estimates are not reported for brevity. Numbers in italics are t-statistics. ***, ** and * indicate 1%, 5% and 10% statistical significance levels, respectively.

TABLE 10

Direct and indirect impact of financial integration on debt maturity

Equation (1): $$MAT_{i,t} = \sum_{c=1}^{22} \alpha_c d_c + \sum_{c=1}^{22} \beta_{1c} d_c ASSETS_{i,t} + \sum_{c=1}^{22} \beta_{2c} d_c MB_{i,t} + \varepsilon_{i,t}$$

Equation (2): $$\hat{\alpha}_c = \gamma_0 + \gamma_1 AVINTDEBT_c + \varepsilon_c$$

Equation (3): $$\hat{\beta}_{1c} = \lambda_0 + \lambda_1 AVINTDEBT_c + \varepsilon_c$$

Equation (4): $$\hat{\beta}_{2c} = \zeta_0 + \zeta_1 AVINTDEBT_c + \varepsilon_c$$

	Intercept	AVINTDEBT	Adj. R^2	N
Equation (2): Country dummy	-0.727	2.004**	0.367	22
	0.62	*2.40*		
Equation (3): ASSETS	0.507	0.056***	0.156	22
	1.11	*4.36*		
Equation (4): MB	1.004*	-0.196***	0.522	22
	2.04	*-3.05*		

Equation (1) is a regression of debt maturity ratios (MAT) on country dummies (d_c), firm size (ASSETS) and market-to-book ratio (MB), in which *i* denotes a firm, *t* denotes a year and *c* denotes a country. Only firms that belong in the big club are included. Standard errors in equation (1) are robust to heteroskedasticity and to residual dependence within firms. Equation (2) is a Weighted Least Squares regression of country dummy coefficients $(\hat{\alpha}_c)$ estimated from equation (1) against the average level of financial integration (AVINTDEBT) for each country. The weights are the inverse standard errors of the corresponding country dummy coefficients, estimated from equation (1). Equation (3) is a Weighted Least Squares regression of size coefficients $(\hat{\beta}_{1c})$ estimated from equation (1) against the average level of financial integration (AVINTDEBT) for each country. The weights are the inverse standard errors of the corresponding size coefficients, estimated from equation (1). Equation (4) is a Weighted Least Squares regression of market-to-book ratio coefficients $(\hat{\beta}_{2c})$ estimated from equation (1) against the average level of financial integration (AVINTDEBT) for each country. The weights are the inverse standard errors of the corresponding market-to-book ratio coefficients, estimated from equation (1). Standard errors in equations (2), (3) and (4) are robust to heteroscedasticity. N is the number of countries. Numbers in italics are t-statistics. ***, ** and * indicate 1%, 5% and 10% statistical significance levels, respectively.

FIGURE 1

Cross-sectional average of debt maturity ratio per year

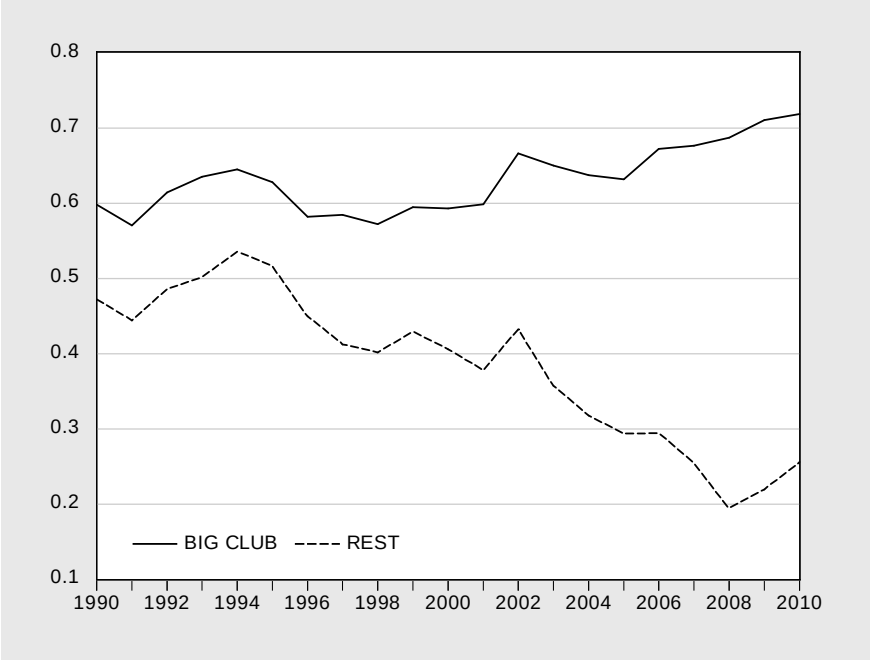

FIGURE 2

Transition curve of debt maturity ratio and international debt

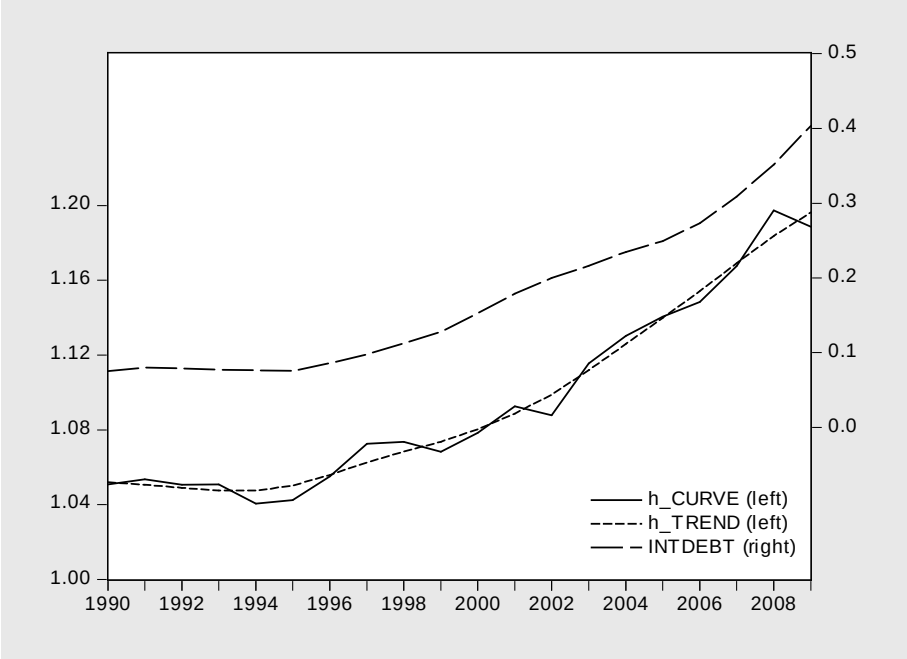

FIGURE 3

Transition curve of debt maturity ratio and financial system deposits

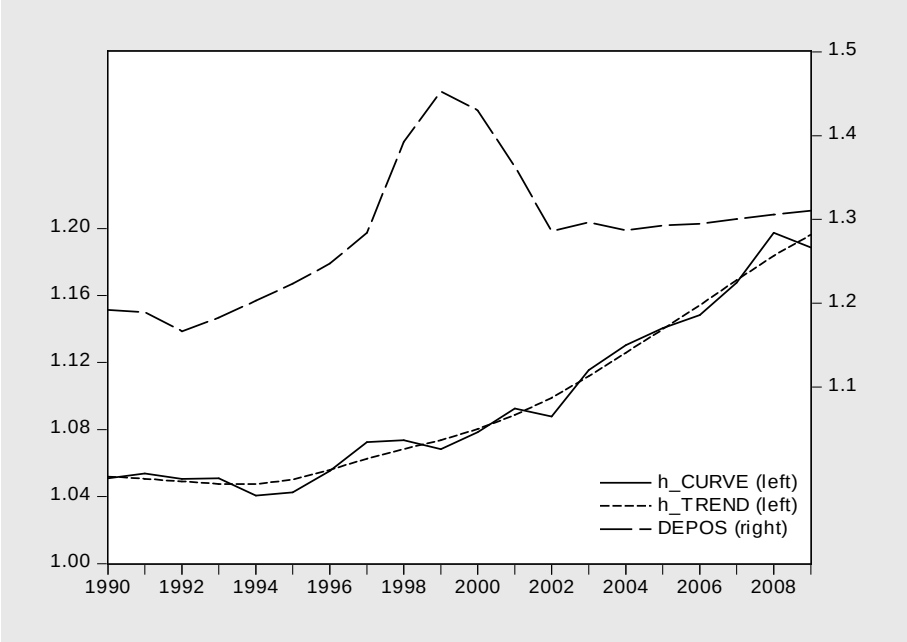

FIGURE 4

Transition curve of debt maturity ratio and insurance premium volume

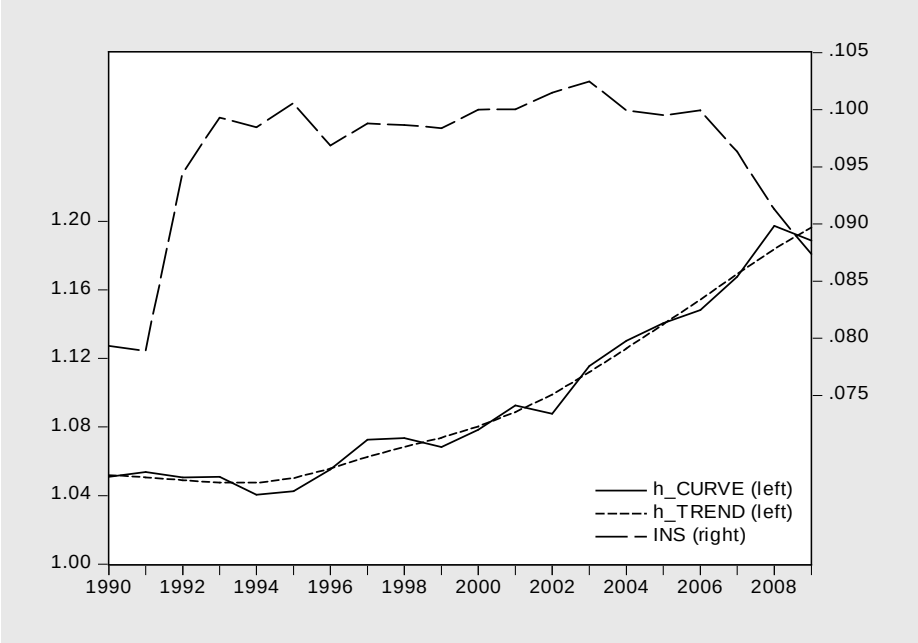

Figure 1 plots the cross-sectional average of the debt maturity ratio for the firms that belong in the big club and for the rest of the firms. Figures 2,3 and 4 plot some of the country-level variables and the relative transition parameter for the big club over time (h-curve). The relative transition parameter for the big club is calculated

every year as the ratio of the average cross-sectional debt maturity ratio of the big club firms over the average cross-sectional debt maturity ratio of all firms.