J. of Multi. Fin. Manag. 21 (2011) 119–150

Contents lists available at ScienceDirect

Journal of Multinational Financial Management

journal homepage: www.elsevier.com/locate/econbase

Capital structure and law around the world

Paulo F. Pereira Alves [a,*], Miguel A. Ferreira [b]

[a] Comissão do Mercado de Valores Mobiliários (CMVM), Portugal
[b] Universidade Nova de Lisboa, European Corporate Governance Institute (ECGI), Portugal

ARTICLE INFO

Article history:
Received 17 June 2010
Accepted 15 February 2011
Available online 23 February 2011

JEL classification:
G32
G38

Keywords:
Capital structure
Institutional environment
Market timing

ABSTRACT

In this research paper we examine the determinants of capital structure using a large panel of firms from 31 countries, all with different legal systems and different levels of investor protection. Our results confirm that institutional variables play an important role in a firm's capital structure, although firm-level determinants seem to be similar around the world. The most important conclusion of this research concerns the negative impact of the interaction between shareholder rights and profitability on market leverage. It suggests that the more shareholder rights there are, the fewer asymmetric problems occur.

1. Introduction

Capital structure has been a perennial subject of study since Modigliani and Miller (1958). In the 1960s and 1970s a considerable amount of research was concentrated on the analysis of the benefits and costs of debt, always assuming the hypothesis of market efficiency and symmetric information. The main objective was to study how firms balance bankruptcy costs with the benefits of tax shields (Kraus and Litzenberger, 1973; Scott, 1976; Kim, 1978). This field of investigation is called static trade-off theory. It is characterised by the idea that firms set a target for a leverage ratio and move towards it.

In the mid 70s, Jensen and Meckling (1976) and Myers (1977) focused on agency costs. Jensen and Meckling (1976) gave more emphasis to the conflicts between management and shareholders (or between control and ownership) and to the conflicts of interest between bondholders and stockholders. The first conflict is characterised by managements' resource to perquisites or aberrant investments,

* Corresponding author.
E-mail address: pauloalves@cmvm.pt (P.F.P. Alves).

1042-444X/$ – see front matter © 2011 Elsevier B.V. All rights reserved.
doi:10.1016/j.mulfin.2011.02.001

destroying the wealth of the firms' owners. Jensen (1986) argued that one way to solve this problem was by issuing debt, avoiding the use of free cash flows in inadequate decisions. The latter conflict can be seen in two different angles: the underinvestment problem (Myers, 1977), when firms – even in the presence of projects with NPV > 0 – reject their execution wherein stockholders refuse to invest in low-risk assets to avoid shifting wealth from themselves to the debtholders; and the asset substitution problem (Jensen and Meckling, 1976), a problem that arises when a company exchanges its low-risk assets for high-risk investments. This substitution transfers value from a firm's bondholders to its shareholders. Corporate finance in the 1980s placed more emphasis on information asymmetries among investors and firms. This microeconomic problem was called Pecking order theory by Myers (1984) and Myers and Majluf (1984). In its purest version, managers cannot issue equity under any circumstance, resulting in the assumption that there is no optimal capital structure. It posits that firms, in consequence of information asymmetries, prefer to use internal rather than external resources, and secured securities rather than unsecured ones. That is, investors would require an incentive to invest in risky securities because they would know less about a firm than its management did. Thus, equity, considering its risk, would be the last alternative a firm would choose for investment, and on the contrary, funds internally generated would be the best financing choice. In fact, according to the Pecking order theory and in opposition to the static trade-off theory, a firm does not have a well-defined target for leverage. Baker and Wurgler (2002) introduced a new theory based on the idea that capital structure is a persistent result of past decisions. Market timing assumes that there are changes in market-to-book values that will produce permanent changes on leverage, contradicting the static trade-off theory point of view. A firm tends to issue (repurchase) equity instead of debt when market value is high (low) in comparison to book value and past market values. The foundations of their theory stem from the results obtained, among others, by: Ritter (1991), who diagnosed the underperformance, particularly of small growth firms after they had gone public, taking advantage of the optimism of investors concerning potential earnings; Pagano et al. (1998), who studied whether the positive relationship between initial public offerings and market valuation resulted from higher investments in industries with growth opportunities or, on the other hand, was an attempt by the owners to misprice those firms excessively, concluding that the latter alternative was the most plausible; and Hovakimian et al. (2001), who suggested that stock prices have an important role on the firm's financing choice, issuing (repurchasing) equity and repurchasing (issuing) debt when a firm experiences stock price increases (decreases), suggesting that managers do not issue equity for reasons related to optimal capital structure, but rather as a way to avoid sharing earnings per share.

The determinants of firm capital structure decisions are typically examined in terms of firm-level characteristics, despite the fact that capital structure choices are also likely to be determined by a firm's institutional environment or a country's infrastructure.[1] Institutional variables and market imperfections influence corporate financing choices. A firm is more likely to raise equity or debt depending, respectively, on whether the country has an efficient capital market or a developed banking system. In an illiquid capital market, investors will demand higher stock returns, increasing the cost of equity of the firms. Under these circumstances a firm has incentives to raise funds using either the banking system or internally generated funds. This is the typical reason, among many others, why research on capital structure, more recently, has focused on the interaction between firm determinants and country infrastructures, namely legal environment, shareholder and creditor rights, capital market development, banking development, and other variables. Variables related to a national financial environment, such as legal system and financial development, are plausible reasons to enlighten why France, Germany, and Japan, for example, have banking-based systems and also why capital markets play an important role in financial choices and in corporate control methods in the US and the UK. Financial environments explain the involvement of German banks in firm decisions, why French firms are controlled by the State, as well as why Turkish firms are owned by families. Anglo-Saxon countries,

[1] Variables related to a national financial environment, such as legal systems and financial development, are seen as relevant not only in theories of capital structure, but also in other areas of corporate finance. For example, La Porta et al. (1999) study the relationship between anti-director rights, highly influenced by law, and corporate ownership. Levine and Zervos (1998), on the other hand, show that long-run economic growth can be achieved through a liquid capital market, complemented by a developed banking system, particularly where securities can be settled efficiently.

on the other hand, present a different environment, namely concerning the legal structure, whereby shareholders and creditholders are well protected, the quality of enforcement and the standards of accountability are generally higher than in Civil law-based countries, and as a result a developed local capital market is expected, motivating firms to issue equity (La Porta et al., 1997, 1998; Demirgüç-Kunt and Levine, 1999).[2] However, the impact of the law on different legal regimes must be analysed with caution because there are several Civil regimes: the French, the German, and the Scandinavian; and the level of creditors' and shareholders' protection differs among them. French Civil law countries present the weakest level of investor protection, whereas countries inspired by the German and Scandinavian Civil law regimes offer greater protection to investors (La Porta et al., 1998).

Rajan and Zingales (1995) were, probably, the first to refer to the importance of studying country specificities in firms' capital structure. Although their research had taken into account some institutional variables such as the size of capital markets, the bankruptcy law, and the relation between ownership and control of firms, they found that these did not interact simultaneously with firm-specific determinants of capital structure. Demirgüç-Kunt and Maksimovic (1996) expanded this research field, analysing the impact of stock market development on firms' financing choices, showing that there is, as would be expected, a negative relationship between long-term and short-term debt and the size of capital market. Booth et al. (2001), following previous studies, examined capital structures in ten developing countries, concluding that determinants of capital structure are not different between developed and developing countries, although maintaining that much has to be done to understand the impact of countries' infrastructures on financing choices. Claessens et al. (2001) examined how corporate finance patterns and risk-taking behaviours are influenced by the legal and financial development of a particular country, and concluded that companies in Common law environments present less risk (for example, in terms of cash flow risk and financial leverage). Fan et al. (2011) debated the impact of some institutional variables such as corruption, taxes, inflation, and legal and political institutions on capital structure and debt maturity choices, suggesting that public policies and institutional environment are more influential on firms' financing choices than industry affiliation. Giannetti (2003) analysed, within a sample of unlisted firms, the impact of firm characteristics, legal rules, and financial development on corporate finance decisions, and concluded that, among other aspects, countries with higher creditor rights standards were particularly interesting for firms characterised by investing in intangible assets since they needed less collateral instruments than they would if they were located in a country with weaker creditor rights. De Jong et al. (2006), on the other hand, evaluated the role of firm- and country-specific determinants of capital structure in 42 countries, concluding, contrary to some literature, that the impact of specific determinants was not equal around the world because they depended on country specific factors.

Our main objective is to evaluate the influence of institutional variables on the determinants of financing choices, namely how they fit into very different theories of capital structure.

We have examined a sample of firms from 31 countries with different features: Australia, Belgium, Brazil, Canada, Chile, Denmark, Finland, France, Germany, Hong Kong, Indonesia, Ireland, Italy, Japan, Malaysia, Mexico, the Netherlands, New Zealand, Norway, Philippines, Portugal, Singapore, South Africa, South Korea, Spain, Sweden, Switzerland, Thailand, Turkey, the UK, and the US.

This sample includes firms in countries with different legal systems as well as different institutional environments. Some firms come from countries that have adopted Common law – such as Malaysia, the UK, and the US –, and as a result of such policy represent a market-based system. Other firms are from countries that use bank-based systems, such as France and Japan, whose legal systems are Civil law-oriented.

Capital structure determinants include both institutional and firm-level variables. We have used five internal exogenous variables: profitability, tangibility, market-to-book, and size (suggested by Rajan and Zingales, 1995) and external finance weighted average (suggested by Baker and Wurgler, 2002). Legal system origin, banking development, capital market development, and investor protections are the institutional variables examined.

[2] However, Rajan and Zingales (2003) deny the positive relationship between Common law-based countries and capital markets development in a time series perspective.

Our contributions reveal that: (1) we consider the origin of the legal system and investor protection as determinants of leverage; (2) we study how firm-level variables interact with the institutional variables in determining capital structure; and (3) we analyse market timing in an international context.

Our results can be summarised as follows. First, we show that shareholder rights, in general, are an important determinant of capital structure even when controlling other institutional variables, e.g., creditor rights, legal systems, capital market development, banking development, corruption index, average number of analysts, and inflation. Second, size seems to be a common determinant of capital structure around the world. We can confirm its importance in 21 countries (see Appendix A) as a determinant of market leverage. Leverage is less sensitive to size (as a proxy for bankruptcy costs) on Scandinavian Civil law based countries. Third, profitability, more than any other firm characteristic, seems to be a common determinant around the world. In 25 countries (see Appendix A) of the sample this variable plays an important role as a determinant of leverage. The relationship between asymmetric information costs and leverage is more pronounced in countries where shareholders are well protected. It means the more shareholder rights there are, the fewer asymmetric problems occur. The Pecking order theory of Myers (1984) and Myers and Majluf (1984) and its relationship with the protection of shareholders is strengthened in this research, regardless of the countries or the size of the firms analysed. Fourth, tangibility seems to be more related with short and long-term debt to assets than with book and market leverage. The greater the shareholder rights are, the lower is the impact of collateral assets on long-term (and short-term) debt to assets. This occurs because either creditor rights or shareholder rights are positively related, and the conflict of interests between shareholders and creditholders is reduced in those circumstances. Fifth, market-to-book and external finance weighted average market-to-book are observable respectively in 22 and 23 countries (see Appendix A). It is not suggested that both variables explain different theories, namely market timing, but as Hovakimian (2006) refers, EFWA contains information about the firm's growth opportunities not observed by current market-to-book. Sixth, our results confirm that firm-level variables are influenced by the institutional environment, namely by shareholder rights, although the impact of country-level variables is not the same in all countries. Seventh, it seems that the results concerning firm-level variables are more constant around the world than country-level variables. Eighth, when firms' size and profitability are controlled, the impact of country-level variables is not similar on all firms. For example, the average number of analysts is only important for small firms, and such is expected. In general, there is less information about small firms. The larger the number of analysts following a small firm the higher is the probability that such firm issues equity.

This paper is organised as follows. Section 2 discusses the determinants of capital structure. Section 3 describes the data and presents descriptive statistics. Section 4 details the results of using a panel data, with industry effects. Section 5 contains considerable robustness and a number of additional tests. Section 6 concludes the paper.

2. Determinants of capital structure

This section debates the factors that determine a firm's capital structure. The underlying theories and previous empirical evidence are also reviewed. First, we present the firm-level variables previously mentioned. Second, we present country-level variables, pertaining to legal and institutional environments, which may influence financing decisions.

2.1. Firm-level variables

2.1.1. Market-to-book

Market-to-book (MB), expectedly, is inversely related to leverage. MB is seen as a proxy for the growth opportunities of a firm. According to Myers (1977), firms with more assets in place should more easily be financed through debt than firms with growth opportunities, which would present a naturally low leverage ratio. In fact, firms with high growth opportunities, whose valuation depends on intangible assets and expected returns, do not presumably finance their projects issuing debt since they are subject to high financial distress costs and their intangible assets have no value in the event of

bankruptcy. Under these conditions, firms avoid to issue equity because much of the value created by investment would be used to offset the creditors' position (underinvestment problem). On the other hand, firms with growth opportunities, with less collateral assets, experience more problems when they are in the presence of risky projects, because creditors see that as a way to expropriate wealth from themselves (the asset substitution problem of Jensen and Meckling, 1976).

Despite the expectation of a negative relationship between growth and leverage (see, for example, Rajan and Zingales, 1995; Hirota, 1999), there is also research that reached the opposite conclusion, namely Chiarella et al. (1992) and Lee et al. (2000).

2.1.2. Profitability

The traditional theory of capital structure theorises a positive relationship between profitability and leverage. Modigliani and Miller (1963) pointed out that a company may opt for debt in order to take advantage of tax shields. Jensen (1986) concluded that profitable firms might issue debt whenever a firm's corporate control is ineffective. The Pecking order theory of Myers (1984) and Myers and Majluf (1984) takes the opposite point of view on this issue. A firm that is generating profits will retain earnings, avoiding asymmetric information costs. The rule is to issue safe securities. Internal funds are better than external funds and only, as a final resort, should a firm issue stock. The decision to issue stock is interpreted negatively by the market, and even when a firm opts for external finance, the market sees debt financing with collateral assets as the most logical decision. Thus, a negative relationship between profitability and leverage is expected. In general, empirical results concerning the relationship between profitability and leverage support the Pecking order hypothesis (Rajan and Zingales, 1995; Booth et al., 2001; Fan et al., 2006; De Jong et al., 2006).

2.1.3. Size

Leverage is expected to be positively influenced by size. The most plausible reason to explain such relationship is bankruptcy costs (Warner, 1977; Marsh, 1982; Rajan and Zingales, 1995). That is: first, large firms have, on average, lower bankruptcy costs – this type of costs are in, general, more fixed – than small firms; second, large firms have in principle more diversified portfolios, with less probability of bankruptcy; third, financial institutions, because they have less information about a small firm, need to allocate more resources concerning the firm's monitoring, and penalise it by asking for higher interest rates. Although the vast majority of research shows a positive relationship between size and leverage, such as Rajan and Zingales (1995) and Shenoy and Koch (1996), there is also some research that reveals the opposite results, namely those obtained by Titman and Wessels (1988).

2.1.4. Tangibility

Creditors, in general, demand more tangible assets in order to finance new projects, so we would expect a positive relationship between tangibility and leverage. This idea is particularly related with the asset substitution problem of Jensen and Meckling (1976). However, the association between tangibility and leverage must be analysed with care. First, there is a more precise connection between long-term debt and tangibility (Wijst and Thurik, 1993; Chittenden et al., 1996). Total debt may not be a perfect functional form because it includes accounts such as current liabilities and accounts payables, which are not perfect substitutes for loans. Second, the relationship between tangibility and leverage is relatively inconsistent with the argument of DeAngelo and Masulis (1980) of tax shield substitutes, namely concerning accounting depreciation. The question is whether the benefits of financing tangible assets by debt are the best way when we are in the presence of other tax shields, such as accounting depreciation. Even so, many researchers show a positive relationship between leverage and tangibility—see Jensen et al. (1992), Rajan and Zingales (1995), and Hirota (1999). Shenoy and Koch (1996), however, find mixed results in the influence of tangibility on leverage across industries. Other authors find a positive relationship between leverage and long-term debt, but a negative relationship between leverage and short-term debt (Wijst and Thurik, 1993; Chittenden et al., 1996).

2.1.5. External finance weighted average market-to-book

According to Baker and Wurgler (2002), firms will choose to issue equity when their stock is overvalued, and to repurchase it in case of undervaluation. They designate such theory as market timing,

and external finance weighted average market-to-book (EFWA) is used as a proxy for market timing. They find a negative and persistent relationship between leverage and EFWA. This theory has been disputed by many authors: Frank and Goyal (2003) show that market conditions affect the process of debt adjustments, but the same should not be assumed for equity; Alti (2003) shows that market timing is a short-term phenomenon; Hovakimian (2006), on the other hand, according to his results, does not conceive external finance weighted average market-to-book as a way to reflect past equity market timing, but as a variable that contains information about the firm's growth opportunities not observed by current market-to-book.

2.2. Country-level variables

2.2.1. Law

There are two basic legal systems, the Common law and the Civil law. Common law was developed following the rulings of decisions in UK courts. Civil law, whose foundation is attributed to Napoleon, is based on Roman principles. It relies on statutes and codes formulated by legal scholars who established national principles and laws. From Civil law three legal regimes emerged, the French, the German, and the Scandinavian. The last two present the highest quality in terms of law enforcement, followed by Common law-based countries, and the lowest in French Civil law regimes. In terms of creditors' and shareholders' rights, Common law-based countries present the highest standards, contrary to French Civil regimes. Financial economists have recently placed more emphasis on the role of a legal system in the domain of financial decisions (Demirgüç-Kunt and Maksimovic, 1996, 1998; La Porta et al., 1997, 1998). Recently, a variety of papers have examined the adoption of different legal systems and their impact on corporate finance. La Porta et al. (1997, 1998) find that the legal environment plays a decisive role in the development of capital markets, because it impacts accounting standards, shareholders' rights, and creditors' rights. They indicate that Common law countries benefit from having both good accounting standards and strong investor protection. Demirgüç-Kunt and Levine (1999) conclude that while countries with a Civil law tradition tend to have undeveloped financial systems, Common law systems create incentives for market-based systems that are positively related to the creation of wealth.

2.2.2. Creditor and shareholder rights

A country's creditor and shareholder rights, influenced by its legal environment, may help to explain why firms around the world have different capital structures. We have considered an index of shareholder rights, defined by La Porta et al. (1998), and comprised of the following items: the country allows shareholders to mail in proxy votes; shareholders are not required to deposit their shares prior to a general shareholder meeting; cumulative voting or proportional representation of minorities on the board of directors is allowed; an underrepresented minorities mechanism is in place; shares of 10% or less entitle a shareholder to call for an extraordinary shareholders' meeting; and shareholders have pre-emptive rights that can only be waved by a shareholder vote. The shareholder rights index ranges from 0 to 6. We have also considered an index of creditor rights defined by La Porta et al. (1998). The index is formed by verifying whether the country imposes restrictions, such as creditor consent or minimum dividends, to file for reorganisation; secured creditors are able to gain possession of their security once a reorganisation petition has been approved (no automatic stay); secured creditors are ranked first in the distribution of the proceeds resulting from the disposition of the assets of a bankrupt firm; and the debtor does not maintain administration of his property pending the resolution creditor rights reorganisation. The creditor rights index ranges from 0 to 4. We have expected a positive impact of shareholder rights on the use of equity, as well as the same impact of creditors' rights on the use of debt.

2.2.3. Capital market and banking development

In less developed capital markets there is less available information about firms for several reasons that may include a weaker regulation, lower corporate governance standards, and limited investor protection rights. This is the ideal feeding ground for information asymmetries among investors and firms, and for developing industries with different characteristics. For example, Wurgler (2000) found

a positive relationship between the development of financial markets and an increase (a reduction) of investment in growing (declining) industries. Bradley et al. (1984) found that whereas instruments and metal mining industries had consistently low leverage, rubber, steel, and airline industries presented high leverage. Rajan and Zingales (1998) demonstrated the importance of a well-developed financial market for industries with more need of external funding. A firm whose growth depends on external capital will grow more rapidly in a developed stock market. We expect the opportunities observed in a developed capital market will induce firms to issue equity; in this case, we presume a lower leverage ratio for developed capital markets. We use the liquidity ratio as a proxy for capital market development. However, Demirgüç-Kunt and Maksimovic (1999) showed a positive relationship between the use of long-term debt and active stock markets, and Demirgüç-Kunt and Maksimovic (1996) concluded that following a development of capital markets, equity is replaced by debt, namely by long-term debt. The liquidity ratio is defined as the volume traded at a local stock exchange divided by the gross domestic product (GDP). On the other hand, we expect a higher leverage ratio in countries characterised by a developed banking system, such as France and Germany. The ratio claims of deposit money bank on private sector by GDP, defined by Demirgüç-Kunt and Levine (1999), is a proxy for the level of banking development, which we call private credit.

3. Data and descriptive statistics

The data extracted from Worldscope include firms from the 31 countries, as shown in Table 1. We have excluded financial institutions because they are subject to specific regulations that influence their leverage. We have also excluded utilities, namely in Table 6, since in the United States and many other countries, utilities are faced with significant regulations that may directly affect their leverage ratios and profitability. The industries include Basic Industries, Cyclical Consumer Goods, Cyclical Services, General Industries, Information Technologies, Non-Cyclical Services, Non-Cyclical Consumer Goods, Resources, and Utilities. Regardless of the legal environment, French, German, Scandinavian Civil regime, or Common type, Basic Industries, Cyclical Consumer Goods, Cyclical Services, General Industries and Non Cyclical Consumer Goods are the most represented industries in the sample. For example, in countries where the law is based on German origins, 91.7% of the firms belong to those five industries, and even in Common law-based countries, the least represented countries by such industries, 77.2% refers to them (see Table A1). We only choose firms that can provide certain financial information. A firm must have continuous information available at least over a five-year period from 1991 up until 2001. Five years of continuous information relates to four observations due to the fact that some variables require calculations obtained using differences over the years (for example, net equity issues and net debt issues). Note also that five annual observations of a firm are required because our research aims to analyse market timing, which is a consequence of past decisions.

Our independent variables are lagged one year in order to avoid reverse causality. Rajan and Zingales (1995) and Bevan and Danbolt (2002) also define their independent variables as lagged on a four and three-year average, respectively.

The sample in Table 1 provides 21,804 observations from 5699 firms. The US and Japan are the most representative countries in our sample—50% of the total number of observations and 52% of the total firms. Ireland, New Zealand and Brazil, on the other hand, are the least represented countries in terms of firms. There are 11 Common law- and 20 Civil law-based countries.[3] However, the number of firms (2818 and 2881 from Civil and Common law-based countries, respectively), and the number of observations (10,501 and 11,303 from Civil and Common law-based countries, respectively), avoid any bias towards the sample. Civil law-based countries are differently represented. Whereas the Scandinavian legal environment is represented by 259 firms (and 1036 observations), the German Civil regimes are represented by 1755 firms (and 6223 observations), and the French Civil regimes by 804 firms (3242 observations). The major capital markets around the world are included in our research, namely the

[3] This sample is generally comparable to the sample in the La Porta et al. (1998) research. They observe 18 countries influenced by Common law and 31 by Civil law.

Table 1
Means of firm-level variables. Book leverage (D/A_{book}) is defined as book debt divided by total assets. Book debt is defined as total assets minus book equity. Book equity is defined as total assets minus total liabilities and preferred stock plus deferred taxes and convertible debt. Market leverage (D/A_{market}) is defined by book debt divided by the result of total assets minus book equity plus market equity. Market equity is defined as market capitalisation. The ratio of short-term debt to total assets (STD/A) is defined as short-term debt divided by total assets. The ratio of long-term debt to total assets (LTD/A) is defined as long-term debt divided by total assets. Tangibility (TANG) is defined as property, plant and equipment divided by total assets. Profitability (PROF) is defined as earnings before interest, taxes, depreciation, and amortisation divided by total assets. Size is defined as logarithm of sales (SALES). Market-to-book (M/B) is defined as the result of total assets minus book equity plus market capitalisation divided by total assets. External finance weighted average (EFWA) market-to-book depends on net equity issues and net debt issues. Net equity issues are defined as the change in book equity minus the change in balance sheet retained earnings divided by total assets. Net debt issues are defined as the residual change in debt divided by assets. The residual change in debt is defined as the annual change in assets minus the annual change in book equity. *N* and firms are the number of observations and firms, respectively. Sample period is from 1996 to 2001. Dependent variables are means from 1996 to 2001. Independent variables are means from 1995 to 2000.

Country	D/A_{book}	D/A_{market}	STD/A	LTD/A	TANG	PROF	SALES	MB	EFWA	*N*	Firms
Panel A: Civil French law countries											
Belgium	0.63	0.54	0.39	0.14	0.30	0.13	13.00	1.39	1.33	113	26
Brazil	0.61	0.64	0.33	0.18	0.44	0.14	13.18	1.00	0.95	56	25
Chile	0.43	0.43	0.20	0.18	0.53	0.12	12.38	1.19	1.57	227	54
France	0.59	0.53	0.42	0.13	0.24	0.12	12.70	1.31	1.31	1,053	255
Indonesia	0.60	0.60	0.40	0.19	0.39	0.13	11.18	1.17	1.31	288	84
Italy	0.58	0.56	0.37	0.12	0.30	0.11	13.16	1.21	1.14	370	84
Mexico	0.49	0.52	0.23	0.24	0.55	0.15	13.91	1.15	1.38	138	33
Netherlands	0.61	0.45	0.42	0.14	0.33	0.16	13.33	1.61	1.55	371	83
Philippines	0.45	0.54	0.28	0.18	0.49	0.10	10.55	1.12	1.65	71	31
Portugal	0.64	0.61	0.43	0.14	0.40	0.11	12.28	1.11	1.06	142	35
Spain	0.54	0.46	0.37	0.11	0.39	0.13	13.06	1.36	1.27	324	66
Turkey	0.55	0.35	0.43	0.06	0.38	0.24	12.33	1.84	1.99	89	28
Mean	0.56	0.52	0.36	0.15	0.40	0.14	12.59	1.29	1.38		
Panel B: Civil German law countries											
Germany	0.65	0.54	0.31	0.12	0.33	0.13	12.97	1.37	1.42	1,118	262
Japan	0.57	0.57	0.42	0.13	0.31	0.06	13.39	1.13	1.28	4,526	1,319
South Korea	0.64	0.81	0.43	0.16	0.42	0.10	13.79	0.81	0.91	171	75
Switzerland	0.53	0.44	0.30	0.18	0.37	0.13	13.03	1.48	1.32	408	99
Mean	0.60	0.59	0.37	0.15	0.36	0.11	13.30	1.20	1.23		
Panel C: Civil Scandinavian law countries											
Denmark	0.52	0.49	0.34	0.17	0.38	0.13	12.11	1.25	1.25	309	73
Finland	0.51	0.45	0.30	0.18	0.37	0.16	12.71	1.32	1.23	263	63
Norway	0.59	0.50	0.28	0.27	0.39	0.12	11.78	1.54	1.65	103	30
Sweden	0.54	0.43	0.30	0.17	0.31	0.15	12.94	1.54	1.46	361	93
Mean	0.54	0.47	0.31	0.20	0.36	0.14	12.39	1.41	1.40		
Panel D: Common law Countries											
Australia	0.49	0.39	0.25	0.20	0.43	0.13	13.02	1.45	1.44	469	116
Canada	0.49	0.44	0.23	0.22	0.47	0.13	13.21	1.37	1.42	798	190
Hong Kong	0.35	0.41	0.28	0.08	0.38	0.10	12.06	1.23	1.49	211	103
Ireland	0.59	0.41	0.30	0.28	0.37	0.13	12.97	1.59	1.58	88	18
Malaysia	0.42	0.43	0.32	0.09	0.45	0.09	11.33	1.41	1.77	138	55
New Zealand	0.42	0.38	0.22	0.19	0.46	0.15	12.45	1.26	1.37	79	25
Singapore	0.47	0.48	0.35	0.12	0.41	0.08	11.29	1.30	1.41	130	47
South Africa	0.46	0.42	0.37	0.08	0.35	0.17	13.36	1.39	1.59	244	51
Thailand	0.52	0.59	0.37	0.16	0.42	0.14	11.19	0.97	1.64	266	78
UK	0.53	0.41	0.37	0.12	0.38	0.14	12.50	1.58	1.63	2,538	552
US	0.50	0.40	0.25	0.21	0.34	0.14	13.29	1.63	1.72	6,342	1,646
Mean	0.48	0.43	0.30	0.16	0.40	0.13	12.42	1.38	1.55		
Overall mean	0.53	0.49	0.33	0.16	0.39	0.13	12.6	1.33	1.42		

Table 1 (*Continued*)

Country	D/A_{book}	D/A_{market}	STD/A	LTD/A	TANG	PROF	SALES	MB	EFWA	*N*	Firms
t-Statistic (Civil vs Common)	3.65***	3.20***	1.97*	0.02	−1.11	0.33	0.84	−1.09	−2.09**		
t-Statistic (French vs Common)	2.99***	2.89**	1.90*	−0.34	−0.34	0.70	0.44	−1.03	−1.92*		
t-Statistic (German vs Common)	3.50**	1.96	1.64	−0.48	−1.73	−1.21	2.75**	−1.15	−2.69*		
t-Statistic (Scandinavian vs Common)	2.42**	1.44	0.19	1.22	−1.91*	1.04	−0.11	0.34	−1.44		
t-Statistic (French vs German)	−1.07	−0.86	−0.22	0.17	1.02	1.61	−2.14*	0.56	1.04		
t-Statistic (French vs Scandinavian)	0.74	1.77	1.94*	−1.68	0.99	−0.24	0.53	−1.22	−0.17		
t-Statistic (German vs Scandinavian)	1.70	1.53	1.62	−1.79	−0.17	−1.85	2.78**	−1.29	−1.11		

developed markets (21). The sample also includes a good number of emerging markets (10), some of which the most important in the world, namely the Brazilian and the Mexican.

Book leverage is defined as book debt divided by total assets (Worldscope Item, WC 02999). We have excluded firms with book leverage superior to one. Book debt is defined as total assets minus book equity. Book equity is defined as total assets minus total liabilities (WC 03351) and preferred stock (WC 03451) plus deferred taxes (WC 03263) and convertible debt (WC 18282). Market leverage is defined as book debt divided by the result of total assets minus book equity plus market equity. Market equity is given by market capitalisation (WC 08001). The ratio of short-term debt to total assets is defined as short-term debt (WC 03051) divided by total assets. The ratio of long-term debt to total assets is defined as long-term debt (WC 03251) divided by total assets.

We have winsorised all firm-level variables (except size), using the bottom and the top 1% of own variable distribution. Tangibility is defined as property, plant, and equipment (WC 02501) divided by total assets. Profitability is defined as earnings before interest, taxes, depreciation, and amortisation (WC 18198) divided by total assets. Size is defined as the logarithm of sales (WC 07240). We could also use the logarithm of assets as a size measure, given recent changes in world industries. For example, hi-tech firms typically present small sales for the volume of assets. We have compared the results obtained using both variables, and the results are similar. Market-to-book is defined as total assets minus book equity plus market capitalisation divided by total assets. In order to avoid multicollinearity between market-to-book and external finance weighted average, we have analysed the determinants of capital structure of firms only five years after calculating net equity and debt issues year-by-year. That is, when we obtained the values for these variables, such as 1991, the first value to be considered for EFWA in our sample dates to 1992. After that, we have calculated successive EFWA up until 1995. Then, should all the information during the period 1991–2000 be available, we would obtain the independent variables that we have considered in this research for the period from 1995 to 2000.

External finance weighted average market-to-book (EFWA) is defined in Baker and Wurgler (2002) as:

$$\left(\frac{M}{B}\right)_{efwa,t-1} = \sum_{s=0}^{t-1} \frac{e_s + d_s}{\sum_{s=0}^{t-1} e_s + d_s} \left(\frac{M}{B}\right)_s \tag{1}$$

where e_s and d_s are, respectively, net equity issues and net debt issues in period *s*. Net equity issues are defined as the change in book equity minus the change in balance sheet retained earnings (WC 03495) divided by total assets. Net debt issues are defined as the residual change in debt divided by assets.

The residual change in debt is defined as the annual change in assets minus the annual change in book equity. We have not considered negative weights in order to assure that we are in the presence of a positive weighted-average.

Table 1 shows the average results for dependent and independent variables by country and by legal system. Because country analysis would produce biased results whereas there are significant differences in the number of observations by country, we decided to focus on groups of countries with the same legal system. The most interesting finding relates to differences in leverage (at the 1% level of statistical significance (t-stat = 3.65)) between Civil law- and Common law-based countries. A similar result is observed in market leverage (t-stat = 3.20). This result, at least, can be explained by the development of capital markets in Common law-based countries (in line with, for example, Demirgüç-Kunt and Levine, 1999). Comparing the means of Common law-based countries with the different Civil regimes (Scandinavian, German, and French) the results are relatively similar with those obtained in confrontation between Common and Civil law-based countries as a whole. In fact, there are no signs of significant differences between the means of Civil regimes. However, that can be a result of some regimes, such as the German and the Scandinavian, being represented by a small number of countries, impeding the obtainment of statistical findings.

Table 1 also confirms that Civil law-based countries present larger short-term debt to assets than Common law-based ones. Civil law- and Common law-based countries have different average values of STD/A, at the 10% level of statistical significance (t-stat = 1.97). That result must be credited only to the larger STD/A of firms located in French Civil regimes. In fact, when we compare French versus Scandinavian Civil regimes the results also indicate that firms from the former countries present larger STD/A (t-stat = 1.94). There are some signs that firms from Scandinavian origins present more financing similarities with firms based on a Common legal environment than the other Civil regimes, particularly with French Civil regimes. Contrary to previous results, there is not enough evidence to support a conclusion on the importance of law in long-term debt to assets. Firms in Civil law- and Common law-based countries reveal similar results for long-term debt to asset values.

Concerning firm-level variables – tangibility, profitability, market-to-book, and size – there is no difference, with statistical significance, between Civil law- and Common law-based countries.[4] However, there is a pronounced difference in external finance weighted average market-to-book (EFWA) among Civil law- and Common law-based countries (t-stat = −2.09). This result is confirmed when we compare Common law-based countries with French and German Civil regimes (t-stat = −1.92 and −2.69, respectively). Table 1 also shows how much larger are the firms located in German regimes, either comparing them with those of Common law-based countries (t-stat = 2.75) or with the other Civil regimes (t-stat = 2.14 and 2.78). Finally, we have found statistical differences between tangibility in Scandinavian regimes in comparison with firms placed in Common law-based countries (t stat = −1.91).

Table 2 provides a summary description of institutional variables. It shows a relatively well-defined relation between capital market development (or liquidity ratio) and legal system. Civil and Common law-based countries present, respectively, on average, 36.7% and 60.2%, although with no statistical significance (t-stat = −1.64). This conclusion seems to be more plausible when comparing Common law-based countries with countries placed in Civil French regimes (liquidity ratio of 60.2% and 26.05%, respectively (t-stat = −2.42)). However, the same results are not observed when other possible comparisons are made. Additionally, private credit differs from Civil to Common law-based countries, 66.3% and 88.5%, respectively, referring to differences with statistical significance at 10% (t-stat = −1.95). This result rivals those obtained in the comparison between Common law-based countries and French and Scandinavian Civil regimes. These results can be extended to developed and emerging markets—developed and emerging markets present, on average, 50.5% and 33.5%, for liquidity ratio (t-stat = 1.29), and 84.5% and 33.5%, on average, for private credit (t-stat = 4.11). This is in line with Demirgüç-Kunt and Levine (1999) who claim that banking systems and capital market development grow and become more active and more efficient as countries become richer.

[4] Although the results for firm-level variables were similar around the world, there are some interesting findings, namely the poor performance of Asian firms in the 1990s, presaging what would happen in 1997, as well as the large size of Japanese keiretsu and the Korean chaebols confirming that Japan and South Korea are countries of conglomerates and large firms.

Table 2
Country-level variables. Market development (D or E) is defined by Morgan Stanley Capital International standards. Liquidity ratio (LR) and private credit (PC) are means over 1991–2000. Liquidity ratio is defined as volume traded at a local stock exchange divided by gross domestic product (GDP). Private credit is claims on private sector/GDP. Liquidity ratio is from World Development Indicators. Claims on private sector/GDP is from International Financial Statistics. Legal system, shareholder rights (SR) and creditor rights (CR) are from La Porta et al. (1998). Corruption index (COR) is an index that ranges from 0 to 10, where higher values indicate more severe corruption. Average number of analysts (ANA) following a listed company in a country is taken from Fan et al. (2006). Inflation rate (INF) is extracted from World Development Indicators, World Bank.

Country	LR	PC	SR	CR	COR	ANA	INF
Panel A: Civil French law countries							
Belgium (D)	10.70%	71.20%	0	2	3.30	12.44	1%
Brazil (E)	14.40%	40.20%	3	1	6.45	14.64	41%
Chile (E)	9.00%	51.40%	5	2	3.20	5.94	8%
France (D)	30.30%	87.70%	3	0	3.15	21.77	2%
Indonesia (E)	9.30%	45.70%	2	4	8.20	11.48	9%
Italy (D)	21.30%	58.90%	1	2	5.55	20.83	4%
Mexico (E)	11.90%	25.20%	1	0	6.76	14.10	16%
Netherlands (D)	83.50%	83.80%	2	2	1.00	29.51	2%
Philippines (E)	17.00%	36.60%	3	0	7.22	11.10	8%
Portugal (D)	17.70%	73.70%	3	1	3.65	6.91	4%
Spain (D)	58.60%	81.60%	4	2	4.52	23.79	4%
Turkey (E)	28.90%	19.50%	2	2	6.40	7.85	80%
Mean	26.05%	56.29%	2.42	1.50	4.95	15.03	15%
Panel B: Civil German law countries							
Germany (D)	37.10%	95.00%	1	3	1.87	30.78	2%
Japan (D)	29.10%	112.60%	4	2	3.14	12.15	1%
South Korea (E)	78.70%	63.90%	2	3	5.90	10.41	5%
Switzerland (D)	135.00%	167.00%	2	1	1.15	19.04	1%
Mean	69.98%	109.63%	2.25	2.25	3.02	18.10	2%
Panel C: Civil Scandinavian law countries							
Denmark (D)	23.40%	44.70%	2	3	0.59	12.57	2%
Finland (D)	39.50%	65.50%	3	1	0.61	14.65	1%
Norway (D)	20.00%	60.80%	4	2	1.21	11.93	2%
Sweden (D)	58.00%	40.90%	3	2	0.95	19.20	2%
Mean	35.23%	52.98%	3.00	2.00	0.84	14.59	2%
Panel D: Common law countries							
Australia (D)	33.10%	75.60%	4	1	1.45	13.61	2%
Canada (D)	40.30%	61.00%	5	1	1.02	16.45	2%
Hong Kong (D)	133.40%	155.00%	5	4	2.79	27.13	3%
Ireland (D)	20.50%	63.80%	4	1	2.05	5.91	2%
Malaysia (E)	103.70%	87.00%	4	4	4.90	23.55	4%
New Zealand (D)	14.70%	96.40%	4	3	0.60	7.16	2%
Singapore (D)	79.30%	95.20%	4	4	0.87	22.05	2%
South Africa (E)	25.40%	62.70%	5	3	5.15	5.69	9%
Thailand (E)	36.50%	94.00%	2	3	6.95	13.34	5%
UK (D)	61.60%	117.10%	5	4	1.65	20.28	3%
US (D)	113.50%	65.90%	5	1	2.27	23.87	3%
Mean	60.20%	88.50%	4.27	2.64	2.70	16.28	3%
Overall mean	45.00%	74.20%	3.13	2.06	3.37	15.81	7%
t-Statistic (Civil vs Common)	−1.64	−1.95*	−4.57***	−1.87*	1.24	−0.25	1.50
t-Statistic (French vs Common)	−2.42**	−2.95***	−3.84***	−2.14**	2.57**	−0.39	1.72
t-Statistic (German vs Common)	0.36	0.91	−2.95**	−0.61	0.26	0.35	−0.98
t-Statistic (Scandinavian vs Common)	−1.64	−3.39***	−2.59**	−1.10	−2.90**	−0.59	−2.36**
t-Statistic (French vs German)	−1.74	−2.36*	0.22	−1.28	1.59	−0.60	1.87*
t-Statistic (French vs Scandinavian)	−0.84	0.37	−1.02	−0.94	6.48***	0.16	1.96*
t-Statistic (German vs Scandinavian)	1.35	2.53*	−1.00	0.40	2.06	0.72	0.51

* Significance at the 10% level.
** Significance at the 5% level.
*** Significance at the 1% level.

Table 2 shows, as La Porta et al. (1998) observe, a profound relationship between legal structure and shareholder rights. Our results are analogous—Civil and Common law-based countries present, on average, a score of 2.64 and 4.27 (t-stat = −4.57) for shareholder rights. A similar outcome is found when comparing Common law-based countries with the different Civil regimes. In fact, this result suggests a well-defined relationship between shareholders' rights and different legal regimes, contrary to other variables, such as creditors' rights. We have also employed three other institutional variables: corruption index, average number of analysts and inflation rate, which will be used as control variables at the end of this research. Our results show that there are some differences in terms of corruption index among Civil regimes. This is particularly observed when we analyse the corruption index since Scandinavian countries present the highest standards of transparency, in opposition to countries based on the Civil French regime.

4. Empirical results

First, we have estimated a regression equation, which includes time and industry-fixed effects:

$$\begin{aligned} \mathrm{LEV}_{i,t} = {} & \alpha + b_1\mathrm{LAW}_{i,t-1} + b_2\mathrm{SR}_{i,t-1} + b_3\mathrm{CR}_{i,t-1} + b_4\mathrm{PC}_{i,t-1} + b_5\mathrm{LR}_{i,t-1} + b_6\mathrm{TANG}_{i,t-1} \\ & + b_7\mathrm{PROF}_{i,t-1} + b_8\mathrm{LN}(\mathrm{Sales}_{i,t-1}) + b_9\mathrm{MB}_{i,t-1} + b_{10}\mathrm{EFWA}_{i,t-1} + u_{i,t} \end{aligned} \quad (2)$$

where $\mathrm{LEV}_{i,t}$ is one of the four different measures of leverage for firm i in period t; LAW (legal dummy variable), SR (shareholder rights), CR (creditor rights), PC (private credit), and LR (liquidity ratio) are institutional variables; TANG is tangibility; PROF is profitability; LN(Sales) is the natural logarithm of sales; MB is market-to-book; EFWA is external finance weighted average market-to-book; and $u_{i,t}$ is the error term.

The results are presented in Panels A–D of Table 3 for different specifications of leverage—book leverage and market leverage, short-term and long-term debt-to-assets. We have chosen to use panel data with time and industry-fixed effects after determining the Hausman (1978) test that rejects, for different functional forms, the hypothesis of $\mathrm{Cov}(\alpha_i, X_{i,t-1}) = 0$. In this case, a fixed effects model is more appropriate, since the fixed effect estimator is consistent. There are many examples in this field of research using panel data, with fixed effects (Hirota, 1999; Booth et al., 2001). The panel data is unbalanced because the number of time periods can vary from 1 to 6.

The regressions explaining leverage (using different functional forms), considering firm and institutional-level variables in individual terms, are presented in columns (1) of Panels A–D, Table 3. Columns (2)–(6) of Panels A–D show how firm and institutional-level variables (different legal regimes and shareholder rights) interact with each other, as a way to evaluate if there is any influence of institutional variables on firm-level variables.

In Panel A, book leverage is used as a dependent variable. The results for all regressions show that shareholders' rights are negatively related with book leverage, as expected and in line with, for example, Claessens et al. (2001). Creditor rights, on the contrary, are positively related with book leverage. In fact, the stronger the creditor rights are the greater is the debt issued by firms. Concerning liquidity ratio and private credit, both present different signs from our expectations. The former is positively influenced by book leverage, as opposite to the latter. However, recent research presents a more well-defined relationship between both variables and debt, particularly long-term debt to assets (see for example, Demirgüç-Kunt and Maksimovic, 1996, who show that following the development of capital markets, equity is replaced with debt, namely long-term debt). Regarding firm-level variables, profitability, sales, and external finance weighted average market-to-book, the results confirm our expectations, in opposition to market-to-book, that seems to exert a positive influence on leverage. However, when we do not include external finance weighted average market-to-book in the diverse functional forms, market-to-book presents a negative relationship with leverage, as expected. Thus, we cannot conclude that the underinvestment problem, defined by Myers (1977), is not observed in this functional form. Hovakimian (2006) suggests EFWA contains information about a firm's growth opportunities not observed by current market-to-book.

Table 3
Panel regression of leverage. Book leverage (D/A_{book}), market leverage (D/A_{market}), short-term debt (STD/A) and long-term debt to assets (LTD/A) are dependent variables. Tangibility (TANG) is defined as property, plant and equipment divided by total assets. Profitability (PROF) is defined as earnings before interest, taxes, depreciation, and amortisation divided by total assets. Size is defined as logarithm of sales (SALES). Market-to-book (MB) is defined as the result of total assets minus book equity plus market capitalisation divided by total assets. External finance weighted average (EFWA) market-to-book depends on net equity issues and net debt issues. Liquidity ratio (LR) is defined as volume traded at a local stock exchange divided by GDP. Private credit (PC) is claims on private sector/GDP. SR is shareholder rights. CR is creditor rights. LAW is a dummy variable (1 common and 0 Civil (French, German, and Scandinavian regimes)). White cross-section *t*-statistics are in parenthesis. The panel data regressions, using industry and year fixed effects, are defined by: $LEV_{i,t} = \alpha + b_a SR_{i,t-1} + b_3 CR_{i,t-1} + b_4 PC_{i,t-1} + b_5 LR_{i,t-1} + b_6 TANG_{i,t-1} + b_7 PROF_{i,t-1} + b_8 LN(Sales_{i,t-1}) + b_{9i,t-1} b_9 MB_{i,t-1} + b_{10} EFWA_{i,t-1} + u_{i,t}$.

	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Book leverage (D/A)						
SR	−0.0243	−0.0214	−0.0300	−0.0251	−0.0323	−0.0889
	(−24.89)***	(−19.60)***	(−27.20)***	(−24.76)***	(−22.89)***	(−11.35)***
CR	0.0099	0.0121	0.0105	0.0111	0.0090	0.0101
	(8.13)***	(9.52)***	(8.34)***	(8.86)***	(6.98)***	(8.37)***
PC	−0.0172	−0.0187	−0.0012	−0.0275	−0.0216	−0.0166
	(−3.34)***	(−3.80)***	(−0.22)**	(−5.37)***	(−4.24)***	(−3.23)***
LR	0.0042	0.0053	0.0056	0.0040	0.0034	0.0054
	(2.21)**	(3.02)**	(3.19)***	(2.32)**	(1.79)*	(2.87)***
TANG	−0.0186	0.0009	−0.0492	−0.0219	0.0193	−0.0286
	(−2.65)***	(0.13)	(−6.62)***	(−3.17)*	(1.95)*	(−1.31)
PROF	−0.5264	−0.5118	−0.4053	−0.5190	−0.9139	−1.0852
	(−27.33)***	(−28.76)***	(−21.79)***	(−30.63)***	(−33.24)***	(−18.38)***
SALES	0.0309	0.0308	0.0324	0.0311	0.0298	0.0139
	(42.25)***	(45.59)***	(44.84)***	(46.21)***	(41.96)***	(6.45)***
MB	0.0195	0.0159	0.0140	0.0209	0.0406	0.0215
	(7.00)***	(6.32)***	(5.48)***	(8.62)***	(9.17)**	(2.20)**
EFWA	−0.0454	−0.0462	−0.0422	−0.0480	−0.0443	−0.0198
	(−13.56)***	(−16.75)***	(−15.02)***	(−17.90)***	(−9.19)*	(−1.68)*
French Law × TANG		−0.1198				
		(−7.15)***				
French Law × PROF		−0.2027				
		(−4.18)***				
French Law × SALES		0.0024				
		(2.99)***				
French Law × MB		0.0269				
		(3.46)***				
French Law × EFWA		0.0150				
		(1.76)*				
German Law × TANG			0.1711			
			(11.52)***			
German Law × PROF			−0.8036			
			(−18.22)***			
German Law × SALES			−0.0012			
			(−1.82)*			
German Law × MB			0.0312			
			(4.68)***			
German Law × EFWA			−0.0195			
			(−2.78)***			
Scandinavian Law × TANG				0.0943		
				(3.17)***		
Scandinavian Law × PROF				−0.1105		
				(−1.33)		
Scandinavian Law × SALES				−0.0065		
				(−4.31)***		
Scandinavian Law × MB				−0.0276		
				(−2.12)**		
Scandinavian Law × EFWA				0.0504		
				(3.61)***		
Common Law × TANG					−0.0606	
					(−4.94)***	
Common Law × PROF					0.5937	

Table 3 (*Continued*)

	(1)	(2)	(3)	(4)	(5)	(6)
					(17.11)***	
Common Law × SALES					0.0015	
					(2.49)**	
Common Law × MB					−0.0302	
					(−5.79)**	
Common Law × EFWA					−0.0041	
					(−0.74)	
SR ×TANG						0.0015
						(−0.30)
SR × PROF						0.1361
						(9.83)***
SR × SALES						0.0043
						(8.39)***
SR × MB						−0.0007
						(−0.33)
SR × EFWA						−0.0061
						(−2.33)**
Adj. R^2	0.20	0.21	0.22	0.20	0.21	0.21
N	21,804	21,804	21,804	21,804	21,804	21,804
Panel B: Market leverage (D/A)						
SR	−0.0231	−0.0213	−0.0269	−0.0242	−0.0252	−0.0660
	(−24.24)***	(−19.43)***	(−24.48)***	(−23.91)***	(−17.95)***	(−8.41)***
CR	0.0062	0.0079	0.0079	0.0077	0.0082	0.0058
	(5.48)***	(6.14)***	(6.34)***	(6.15)***	(6.40)***	(5.17)***
PC	−0.0171	−0.0168	−0.0237	−0.0295	−0.0345	−0.0140
	(−3.38)***	(−3.41)***	(−4.20)**	(−5.78)***	(−6.82)***	(−2.71)***
LR	0.0104	0.0113	0.0155	0.0102	0.0034	0.0113
	(5.27)***	(6.45)***	(8.77)***	(5.96)***	(8.70)***	(5.76)***
TANG	0.0106	0.0228	−0.0114	0.0066	0.0459	0.0289
	(−1.51)	(3.17)***	(−1.54)***	(0.96)	(4.68)***	(−1.33)
PROF	−0.7424	−0.7336	−0.6014	−0.7338	−1.0701	−1.1605
	(−40.17)***	(−41.25)***	(−32.52)***	(−43.44)***	(−39.18)***	(−19.65)***
SALES	0.0163	0.0159	0.0144	0.0164	0.0190	0.0107
	(21.95)***	(23.47)***	(20.01)***	(24.49)***	(26.84)***	(4.90)***
MB	−0.0951	−0.0952	−0.0911	−0.0945	−0.1048	−0.1605
	(−35.50)***	(−38.01)***	(−36.00)***	(−39.14)***	(−23.80)***	(−14.54)***
EFWA	−0.0597	−0.0585	−0.0572	−0.0615	−0.0680	−0.0358
	(−19.59)***	(−21.24)***	(−20.49)***	(−22.98)***	(−14.21)***	(−3.04)***
French Law × TANG		−0.0762				
		(−4.55)***				
French Law × PROF		−0.1173				
		(−2.42)***				
French Law × SALES		0.0049				
		(6.11)***				
French Law × MB		−0.0010				
		(−0.12)				
French Law × EFWA		−0.0037				
		(−0.43)				
German Law × TANG			0.1438			
			(9.74)***			
German Law × PROF			−0.6984			
			(−15.93)***			
German Law × SALES			0.0064			
			(9.90)***			
German Law × MB			−0.0267			
			(−4.03)***			
German Law × EFWA			−0.0190			
			(−2.72)***			
Scandinavian Law × TANG				0.1068		
				(3.60)***		
Scandinavian Law × PROF				−0.1694		

Table 3 (*Continued*)

	(1)	(2)	(3)	(4)	(5)	(6)
				(−2.05)**		
Scandinavian Law × SALES				−0.0063		
				(−4.18)***		
Scandinavian Law × MB				0.0006		
				(0.05)		
Scandinavian Law × EFWA				0.0165		
				(1.18)		
Common Law × TANG					−0.0513	
					(−4.21)***	
Common Law × PROF					0.5596	
					(16.23)***	
Common Law × SALES					−0.0070	
					(−11.42)***	
Common Law × MB					0.0151	
					(2.90)***	
Common Law × EFWA					0.0104	
					(1.88)*	
SR ×TANG						−0.0053
						(−1.05)
SR × PROF						0.1028
						(7.34)***
SR × SALES						0.0014
						(2.73)***
SR × MB						0.0152
						(6.24)***
SR × EFWA						−0.0056
						(−2.12)**
Adj. R^2	0.45	0.45	0.46	0.45	0.46	0.45
N	21,804	21,804	21,804	21,804	21,804	21,804
Panel C: Short-term debt to assets (STD/A)						
SR	−0.0090	0.0004	−0.0179	−0.0092	0.0009	−0.0538
	(−10.16)***	(0.39)	(−19.70)***	(−10.93)***	(0.78)	(−7.67)***
CR	0.0161	0.0222	0.0156	0.0163	0.0226	0.0161
	(14.44)***	(21.26)***	(15.07)***	(15.62)***	(21.25)***	(14.57)***
PC	0.0597	0.0708	0.0801	0.0572	0.0220	0.0599
	(13.33)***	(17.44)***	(17.13)***	(13.34)***	(5.22)***	(13.30)***
LR	−0.026	−0.0201	−0.0207	−0.0260	−0.0122	−0.0252
	(−17.56)***	(−13.96)***	(−14.14)***	(−18.10)***	(−7.89)***	(−17.25)***
TANG	−0.2595	−0.2379	−0.2466	−0.2566	−0.3132	−0.3440
	(−43.38)***	(−40.01)***	(−40.23)***	(−44.51)	(−38.36)***	(−17.75)***
PROF	−0.3486	−0.3751	−0.1817	−0.3487	−0.5960	−0.7305
	(−21.64)***	(−25.57)***	(−11.86)***	(−24.63)***	(−26.24)***	(−12.72)***
SALES	0.0113	0.0118	0.0099	0.0113	0.0151	0.0048
	(19.07)***	(21.19)***	(16.89)***	(20.02)***	(25.68)***	(2.46)***
MB	0.0136	0.0116	0.0128	0.0142	0.0246	0.0051
	(6.58)***	(5.59)***	(6.10)***	(7.01)***	(6.72)***	(−0.65)
EFWA	−0.0283	−0.0277	−0.0257	−0.0291	−0.0349	−0.0358
	(−11.81)***	(−12.16)***	(−11.10)***	(−12.99)***	(−8.77)***	(−3.74)***
French Law × TANG		−0.1079				
		(−7.81)***				
French Law × PROF		−0.0170				
		(−0.42)				
French Law × SALES		0.0064				
		(9.80)***				
French Law × MB		0.0154				
		(2.39)**				
French Law × EFWA		0.0115				
		(1.64)				

Table 3 (*Continued*)

	(1)	(2)	(3)	(4)	(5)	(6)
German Law × TANG			−0.0141			
			(−1.15)			
German Law × PROF			−1.0030			
			(−27.60)***			
German Law × SALES			0.0070			
			(12.99)***			
German Law × MB			0.0022			
			(0.40)			
German Law × EFWA			−0.0146			
			(−2.54)**			
Scandinavian Law × TANG				−0.0597		
				(−2.40)**		
Scandinavian Law × PROF				0.0221		
				(0.32)		
Scandinavian Law × SALES				0.0004		
				(0.30)		
Scandinavian Law × MB				−0.0139		
				(−1.28)		
Scandinavian Law × EFWA				0.0174		
				(1.49)		
Common Law × TANG					0.1044	
					(10.30)***	
Common Law × PROF					0.4728	
					(16.49)***	
Common Law × SALES					−0.0107	
					(−21.00)***	
Common Law × MB					−0.0139	
					(−3.21)***	
Common Law × EFWA					0.0100	
					(2.17)**	
SR × TANG						0.0203
						(4.68)***
SR × PROF						0.0931
						(7.22)***
SR × SALES						0.0016
						(3.36)***
SR × MB						0.0019
						(−1.08)
SR × EFWA						0.0018
						(−0.84)
Adj. R^2	0.27	0.29	0.30	0.26	0.29	0.27
N	21,804	21,804	21,804	21,804	21,804	21,804
Panel D: Long-term debt to assets (LTD/A)						
SR	0.0057	0.0028	0.0042	0.0063	−0.0055	−0.0085
	(7.72)***	(3.46)***	(5.13)***	(8.47)***	(−5.33)***	(−1.60)
CR	−0.0127	−0.0145	−0.0134	−0.0133	−0.0174	−0.0126
	(−12.82)***	(−15.52)***	(−14.48)***	(−14.42)***	(−18.37)***	(−12.72)***
PC	−0.0660	−0.0722	−0.0500	−0.0604	−0.0448	−0.0645
	(−16.84)***	(−19.91)***	(−11.89)***	(−16.01)***	(−11.98)***	(−16.46)***
LR	0.0211	0.0190	0.0173	0.0211	0.0117	0.0215
	(14.22)***	(14.75)***	(13.16)***	(16.69)***	(8.51)***	(14.34)***
TANG	0.2291	0.2302	0.2029	0.2213	0.2927	0.3515
	(39.24)***	(43.31)***	(36.86)***	(43.60)	(40.33)***	(17.43)***
PROF	−0.1716	−0.1539	−0.1937	−0.1651	−0.2614	−0.2720
	(−12.01)***	(−11.75)***	(−14.06)***	(−13.25)***	(−12.95)***	(−5.96)***
SALES	0.0127	0.0126	0.0149	0.0130	0.0096	0.0022
	(24.17)***	(25.28)***	(27.91)***	(26.15)***	(18.35)***	−1.43
MB	−0.0059	−0.0067	−0.0100	−0.0056	0.0040	−0.0143
	(−2.83)***	(−3.64)***	(−5.28)***	(−3.15)***	(1.22)	(−1.94)***
EFWA	−0.0073	−0.0097	−0.0038	−0.0078	−0.0066	0.0422
	(−3.18)***	(−4.77)***	(−1.82)*	(−3.94)***	(−1.86)*	(4.55)***

Table 3 (*Continued*)

	(1)	(2)	(3)	(4)	(5)	(6)
French Law × TANG		−0.0186				
		(−1.51)				
French Law × PROF		−0.0871				
		(−2.44)**				
French Law × SALES		−0.0032				
		(−5.47)***				
French Law × MB		0.0048				
		(0.83)				
French Law × EFWA		0.0183				
		(2.93)***				
German Law × TANG			0.1179			
			(10.72)***			
German Law × PROF			−0.032			
			(−0.99)			
German Law × SALES			−0.0044			
			(−8.90)***			
German Law × MB			0.0230			
			(4.67)***			
German Law × EFWA			−0.0215			
			(−4.14)***			
Scandinavian Law × TANG				0.1769		
				(8.08)***		
Scandinavian Law × PROF				−0.1384		
				(−2.27)**		
Scandinavian Law × SALES				−0.0034		
				(−3.05)***		
Scandinavian Law × MB				−0.0137		
				(−1.43)		
Scandinavian Law × EFWA				0.0294		
				(2.86)***		
Common Law × TANG					−0.1138	
					(−12.63)***	
Common Law × PROF					0.0778	
					(3.05)***	
Common Law × SALES					0.0078	
					(17.26)***	
Common Law × MB					−0.0150	
					(−3.91)***	
Common Law × EFWA					−0.0033	
					(−0.80)	
SR ×TANG						−0.0306
						(−6.69)***
SR × PROF						0.0245
						(2.26)**
SR × SALES						0.0028
						(7.28)***
SR × MB						0.0019
						(−1.09)
SR × EFWA						−0.012
						(−5.69)***
Adj. R^2	0.23	0.22	0.23	0.22	0.23	0.23
N	21,804	21,804	21,804	21,804	21,804	21,804

* Significance at the 10% level.
** Significance at the 5% level.
*** Significance at the 1% level.

In spite of our expectations,[5] leverage is negatively influenced by tangibility. This can be explained by the nature of the sample. For example, Shenoy and Koch (1996) obtained different signs for different industries. However, this can also be explained by the functional form used, since Wijst and Thurik (1993) and Bevan and Danbolt (2000) showed that tangibility is positively (negatively) influenced by long-term debt to assets (short-term debt to assets). Antoniou et al. (2002), using a panel of firms, suggested that the well-defined signs of the relationship between tangibility and leverage in the major European markets (France, Germany, and the UK) are more pronounced in countries where bank loans play an important role in corporate finance.

Concerning the interaction between firm and institutional variables, similar effects, in general, were obtained considering shareholder rights or Common law regimes. From column (6), of Panel A, we have inferred the existence of a negative relationship between shareholder rights and profitability. In fact, when shareholder rights vary from 1 to 5, we have concluded that profitability varies from −0.9491 (−1.0852 + 1 * 0.1361) to −0.4047 (−1.0852 + 5 * 0.1361). The same pattern occurs when countries adopt a common legal system, as it can be observed in column (5), from −0.9139 (−0.9139 + 0 * 0.5937) to −0.3202 (−0.9139 + 1 * 0.5937). It means that the more shareholder rights there are the fewer asymmetric problems occur. This relationship cannot be extended to Civil law regimes. In fact, when we are in the presence of a Civil Scandinavian regime the slope increases from −0.519 to −0.6295; in the case of German Civil regimes it increases from −0.4053 to −1.2089; and, finally, from −0.5118 to −0.7145 in the case of French Civil regimes. In other words, firms retain more profits in the presence of an institutional environment characterised by lower shareholder rights, that is, when shareholders are less protected, leverage is more sensitive to profitability.

Also the impact of sales (size) varies according to the level of shareholder rights (and law). In this case, when shareholder rights vary from 1 to 5, the sales parameter changes from 0.0182 (0.0139 + 1 * 0.0043) to 0.0354 (0.0139 + 5 * 0.0043). It suggests that size is more sensitive in Common law-based countries. However, as opposite to profitability, the relationship between size, law regime and leverage is not completely obvious. In fact for the same book leverage, *cetaris paribus*, firms located in Civil Scandinavian regimes are less sensitive to size (0.0246 = 0.0311 − 0.0065) than the firms placed in Common law-based regimes (0.0313 = 0.0298 + 0.0015) and in Civil German regimes (0.0312 = 0324 − 0.0012). Firms placed in Civil French regimes, on the contrary, are the most sensitive to size (0.0332 = 0.0308 + 0.0024).

Our results also denote a negative relationship resulting from the interaction between EFWA and shareholder rights, and the consequent impact on the dependent variable book leverage. When shareholder rights vary from 1 to 5, external finance weighted average market-to-book varies from −0.0259 (−0.0198 − 0.0061 * 1) to −0.0503 (−0.0198 − 0.0061 * 5). We suspect that in countries where shareholders are well protected, managements easily replace debt with equity, or vice versa, because there is a reliable relationship between management and investors that is not possible to observe in a Civil legal environment. However, such relationship exists in Civil German regimes where the impact of EFWA on book leverage is the largest (−0.0617 = −0.0422 − 0.095), followed by Common law-based regimes (−0.0484 = −0.0433 − 0.0041).

The results considering market leverage regressions (Panel B) do not differ significantly from those obtained for book leverage, rather the reverse. Only tangibility assumes a positive relationship with market leverage, although with no statistical significance. On the other hand, market-to-book presents a negative sign, with statistical significance, as expected. The marginal impact of profitability on market leverage, as on book leverage, is lower in Common law-based countries in the same way that size also presents a lower marginal impact on Civil Scandinavian regimes.

When we analyse the determinants of long-term and short-term debt to assets (Panels C and D), the results concerning tangibility confirm what we previously noticed. Tangibility is negatively related to short-term debt, and positively related to long-term debt to assets, independently of the legal regime. On this subject we must say that when we consider short-term debt to assets, as a

[5] Booth et al. (2001) and Fan et al. (2006), among others, also find tangibility has a negative influence on leverage in many countries.

dependent variable, the impact of tangibility varies from −0.3237 to −0.2425, as a result of changes on shareholder rights from 1 to 5. On the other hand, when shareholder rights change from 1 to 5, the impact of tangibility on long-term debt to assets varies from 0.3209 to 0.1985. This means that the stronger the shareholder rights are, the lower is the impact of collateral assets on long-term (and short-term) debt to assets. This occurs because either creditor rights or shareholder rights are positively related, and the conflict of interests between shareholders and creditholders is reduced under those circumstances.

In Table 4, we have used market leverage as a dependent variable, considering year and industry as random effects. The largest adjusted R^2, obtained in Table 3, was the reason for our choice of that dependent variable. In general, the results do not differ from those exhibited in Table 3, Panel B, namely the lower impact of profitability on the dependent variable if we consider firms placed in Common law-based countries and also, on the other hand, the identical behaviour for size when we are in the presence of firms from Civil Scandinavian regimes.

In Table 5 we have analysed which firm and institutional variables influence market leverage, considering the Fama and MacBeth (1973) approach. In this case, we have only taken into account the interaction between shareholder rights and firm-level variables. The results are relatively similar to those presented in Tables 3 and 4, particularly the influence of shareholder rights on profitability (sales), which show that the higher the shareholders' rights are the lower (higher) is the impact of profitability (sales) on market leverage.

Table 6 , Panel A analyses the determinants of market leverage considering countries with different characteristics in terms of legal system, economic and capital market development: Civil versus Common law-based countries, countries with high versus those with low shareholder rights, developed markets, except G7, emerging markets, all countries except utilities, and all countries except Japan and the USA, and the whole sample. We have used panel data regressions, using year and industry fixed effects. In Table 6 we have found comparable results to those previously obtained, whatever the group of countries chosen, namely in terms of: market-to-book, EFWA, shareholder rights, profitability and sales. The interaction between shareholder rights and firm-level variables confirms, considering the whole sample or excluding Japan and the USA or utilities, the results are presented in Table 5. There is the same impact of the interaction between shareholder rights and sales, profitability, and market-to-book on market leverage. In Panel B of Table 6 we have considered a few additional control variables, namely the average number of analysts, inflation, and corruption perception index. The most important result of such inclusion relates to the impact of country-level variables on market leverage. Our results show that the impact of institutional variables on market leverage is not similar around the world. This can be observed, particularly, in terms of inflation rate and average number of analysts.

To sum up, our results show that the institutional environment, particularly the legal structure and shareholder rights, is an important variable that must be taken into account when analysing the determinants of capital structure. However, its impact is the same around the world. We consider that there is much work left for analysis concerning the impact of firm and, particularly, institutional-level variables on firms' capital structure, but we have no doubt that both, alone or interacted, influence the financing decisions (see for example, Giannetti, 2003; Fan et al., 2006). We have also no doubt that firm and particularly institutional determinants do not have the same importance in all countries or in all types of firms, comparatively to firms' financing decisions (see for example, De Jong et al., 2006). Second, tangibility is closely related to short and long-term debt to assets. In this case, the impact of tangibility on leverage is more pronounced in countries where shareholders are less protected. Third, profitability, as well as its interaction with shareholder rights, is the most consistent determinant of capital structure, and the level of shareholders protection implies that the higher shareholder rights are the lower is the impact of profitability on market leverage, meaning that lower asymmetric costs are associated with countries where shareholders are well protected. Fourth, the importance of sales, as a determinant of capital structure, depends on the group of countries that are being analysed. Firms placed in Scandinavian Civil regimes are the least sensitive to this variable, as opposite to those located in French Civil regimes. Nevertheless, we have concluded that leverage is more sensitive to size (as a proxy for bankruptcy costs) in countries where shareholders' rights present a higher score. Fifth, EFWA and market-to-book present mixed

Table 4
Country-random regression of leverage. Market leverage (D/A_{market}) is a dependent variable. Tangibility (TANG) is defined as property, plant and equipment divided by total assets. Profitability (PROF) is defined as earnings before interest, taxes, depreciation, and amortisation divided by total assets. Size is defined as logarithm of sales (SALES). Market-to-book (M/B) is defined as the result of total assets minus book equity plus market capitalisation divided by total assets. External finance weighted average (EFWA) market-to-book depends on net equity issues and net debt issues. Liquidity ratio (LR) is defined as volume traded at a local stock exchange divided by GDP. Private credit (PC) is claims on private sector/GDP. SR is shareholder rights. CR is creditor rights. LAW is a dummy variable (1 common and 0 Civil French, German, and Scandinavian regimes). White cross-section *t*-statistics are in parenthesis. The panel data regressions, using year and industry country random effects, are defined by: $LEV_{i,t} = \alpha + b_1 Law_{i,t-1} + b_2 SR_{i,t-1} + b_3 CR_{i,t-1} + b_4 PC_{i,t-1} + b_5 LR_{i,t-1} + b_6 TANG_{i,t-1} + b_7 PROF_{i,t-1} + b_8 LN(Sales_{i,t-1}) + b_{9i,t-1} b_9 MB_{i,t-1} + b_{10} EFWA_{i,t-1} + u_{i,t}$.

	(1)	(2)	(3)	(4)	(5)	(6)
Market leverage (D/A)						
SR	−0.0243	−0.0228	−0.0281	−0.0255	−0.0258	−0.0723
	(−24.53)***	(−20.95)***	(−25.76)***	(−25.49)***	(−18.44)***	(−10.17)***
CR	0.0075	0.0093	0.0093	0.0092	0.0097	0.0074
	(6.10)***	(7.43)***	(7.52)***	(7.41)***	(7.65)***	(6.11)***
PC	−0.0147	−0.0131	−0.0227	−0.0258	−0.0333	−0.0107
	(−3.06)***	(−2.66)***	(−4.04)**	(−5.06)***	(−6.58)***	(−2.24)**
LR	0.0117	0.0128	0.0173	0.0119	0.0181	0.0130
	(7.06)***	(7.70)***	(10.15)***	(7.24)***	(10.13)***	(7.97)***
TANG	0.0030	0.0107	−0.0163	−0.0036	0.0487	0.0346
	(0.48)	(1.62)	(−2.38)**	(−0.57)	(5.05)***	(1.68)*
PROF	−0.7333	−0.7220	−0.5844	−0.7243	−1.0700	−1.1745
	(−44.40)***	(−40.74)***	(−31.74)***	(−43.02)***	(−39.22)***	(−21.44)***
SALES	0.0168	0.0166	0.0150	0.0171	0.0195	0.0097
	(25.48)***	(24.87)***	(21.22)***	(25.79)***	(27.87)***	(4.73)***
MB	−0.0975	−0.0985	−0.0934	−0.0973	−0.1079	−0.1627
	(−41.27)***	(−39.60)***	(−37.04)***	(−40.57)***	(−24.59)***	(−18.50)***
EFWA	−0.0630	−0.0626	−0.0617	−0.0654	−0.0693	−0.0390
	(−24.02)***	(−22.88)***	(−22.24)***	(−24.58)***	(−14.50)***	(−3.99)***
French Law × TANG		−0.0621				
		(−3.72)***				
French Law × PROF		−0.1175				
		(−2.42)***				
French Law × SALES		0.0045				
		(5.69)***				
French Law × MB		0.0013				
		(0.17)				
French Law × EFWA		−0.0059				
		(−0.69)				
German Law × TANG			0.1492			
			(10.20)***			
German Law × PROF			−0.7349			
			(−16.83)***			
German Law × SALES			0.0062			
			(9.59)***			
German Law × MB			−0.0284			
			(−4.30)***			
German Law × EFWA			−0.0129			
			(−1.86)*			
Scandinavian Law × TANG				0.1213		
				(4.10)***		
Scandinavian Law × PROF				−0.1401		
				(−1.69)*		
Scandinavian Law × SALES				−0.0063		
				(−4.25)***		
Scandinavian Law × MB				−0.0028		
				(−0.83)		
Scandinavian Law × EFWA				0.0160		
				(1.15)		
Common Law × TANG					−0.0624	
					(−5.19)***	
Common Law × PROF					0.5773	
					(16.77)***	

Table 4 (*Continued*)

	(1)	(2)	(3)	(4)	(5)	(6)
Common Law × SALES					−0.0068	
					(−11.21)***	
Common Law × MB					0.0160	
					(3.08)***	
Common Law × EFWA					0.0073	
					(1.32)	
SR ×TANG						−0.0086
						(−1.81)*
SR × PROF						0.1089
						(8.51)***
SR × SALES						0.0018
						(3.74)***
SR × MB						0.0149
						(7.53)***
SR × EFWA						−0.0059
						(−2.67)***
Adj. R^2	0.41	0.42	0.43	0.42	0.43	0.42
N	21,804	21,804	21,804	21,804	21,804	21,804

* Significance at the 10% level.
** Significance at the 5% level.
*** Significance at the 1% level.

results when simultaneously considered, although this does not mean that they mean different theories.

5. Robustness and additional tests

Table 7 , Panel A analyses the impact of firm and institutional variables on market leverage, controlling firms' sales (by quartiles) and considering the panel data with year and industry-fixed effects. The corruption perception index reveals a positive influence on market leverage. Investors do not like to buy shares in countries where the relationship between firms, government agencies, and justice is not very clear. On the other hand, creditor rights influence negatively market leverage when in the presence of small firms, contrarily to the remaining quartiles. The opposite happens in relation to private credit. In this case, there is a positive relationship between the use of debt by small firms and the size of the banking system. This result seems to explain why it is so difficult for some firms to go public in many countries. The liquidity ratio always presents a positive relationship. The positive relationship between the use of long-term debt and active stock markets, found by Demirgüç-Kunt and Maksimovic (1999), can be a plausible explanation for such result. The average number of analysts is only important for small firms, as was expected. In general, there is less information about small firms. If many analysts follow a small firm the probability that such firm will issue equity increases significantly. Also, regarding small firms and firms from the second quartile one can observe a positive impact of tangibility on market leverage. We suspect the overinvestment problem is less pronounced in large firms because there is much more information about them, avoiding the allocation of collateral debt to a specific project. The results obtained for profitability, market-to-book, and EFWA are in line with previous ones. However, it must be highlighted that the largest firms are more sensitive to profitability than the smallest. This can occur because a large firm expects to issue more equity than a small one, and a way to avoid future asymmetric problems is by holding present earnings.

In Panel B of Table 7, we have used a similar approach as used in Panel A, but controlling the firm's profitability. As prior results indicate, country and firm-level variables seem to produce different impacts on market leverage. The results concerning the corruption perception index are more definitive in this case. The market leverage of a more profitable firm is less sensitive to corruption than a less profitable one. We also show that a firm with high profitability presents a less sensitive market leverage when shareholders are well protected, because lower asymmetric costs are expected in such conditions. On the other hand, the impact of the average number of analysts on market lever-

Table 5
Cross-sectional regression of leverage. Market leverage (D/A_{market}) is dependent variable. Tangibility (TANG) is defined as property, plant and equipment divided by total assets. Profitability (PROF) is defined as earnings before interest, taxes, depreciation, and amortisation divided by total assets. Size is defined as logarithm of sales (SALES). Market-to-book (M/B) is defined as the result of total assets minus book equity plus market capitalisation divided by total assets. External finance weighted average (EFWA) market-to-book depends on net equity issues and net debt issues. Liquidity ratio (LR) is defined as volume traded at a local stock exchange divided by GDP. Private credit (PC) is claims on private sector/GDP. SR is shareholder rights. CR is creditor rights. White cross-section t-statistics are in parenthesis. The panel regression model is defined by: $LEV_{i,t} = \alpha + b_1 Law_{i,t-1} + b_2 SR_{i,t-1} + b_3 CR_{i,t-1} + b_4 PC_{i,t-1} + b_5 LR_{i,t-1} + b_6 TANG_{i,t-1} + b_7 PROF_{i,t-1} + b_8 LN(Sales_{i,t-1}) + b_{9i,t-1} b_9 MB_{i,t-1} + b_{10} EFWA_{i,t-1} + u_{i,t}$.

	1996	1997	1998	1999	2000	2001	1996–2001
SR	−0.1079	−0.1090	−0.0857	−0.0841	−0.0165	−0.0542	−0.0762
	(−5.30)***	(−6.33)***	(−4.92)***	(−4.81)***	(−0.97)***	(−3.57)***	(−5.27)***
CR	0.0089	0.0082	0.0091	0.0010	0.0063	−0.0020	0.0052
	(3.04)***	(2.70)***	(2.89)***	(−0.30)	(2.17)**	(−0.73)	(2.75)**
PC	−0.0340	0.0194	−0.0171	0.0267	−0.0640	0.0067	−0.0104
	(−2.62)***	(−1.60)	(−1.36)	(2.14)**	(−5.73)***	(−0.63)	(−0.73)
LR	0.0383	−0.0403	−0.0266	−0.0107	0.0059	−0.0107	−0.0074
	(2.56)**	(−3.87)***	(−3.55)***	(−1.70)**	(−1.33)	(−3.79)***	(−0.66)
TANG	−0.0568	0.0461	0.0451	0.0063	0.1115	0.0142	0.0277
	(−0.95)	(−0.93)	(−0.90)	(−0.13)	(2.24)**	(0.32)	(1.22)
PROF	−1.3809	−1.1065	−0.9524	−1.0220	−1.0390	−1.2822	−1.1305
	(−8.05)***	(−8.25)***	(−6.98)***	(−8.00)***	(−7.92)***	(−10.95)***	(−16.65)***
SALES	0.0187	−0.0003	0.0003	0.0051	0.0186	0.0166	0.0098
	(3.26)***	(−0.06)	(0.06)	(1.00)	(3.75)***	(3.82)***	(2.64)**
MB	−0.1367	−0.1919	−0.2050	−0.1430	−0.1432	−0.1516	−0.1619
	(−3.39)***	(−7.84)***	(−8.71)***	(−7.13)***	(−7.84)***	(−8.33)***	(−13.68)***
EFWA	−0.1789	0.0001	−0.0138	−0.0920	−0.0454	−0.0322	−0.0604
	(−4.58)***	(0.01)	(−0.54)	(−4.03)***	(−2.05)**	(−1.68)***	(−2.23)*
SR × TANG	0.0083	−0.0130	−0.0121	−0.0057	−0.0281	0.0000	−0.0085
	−0.62	(−1.13)	(−1.04)	(−0.49)	(−2.45)***	(−0.01)	(−1.66)
SR × PROF	0.1907	0.0956	0.0780	0.1207	0.0703	0.1171	0.1121
	(4.88)***	(3.02)***	(2.41)**	(4.07)***	(2.32)**	(4.24)***	(6.31)***
SR × SALES	0.0002	0.0044	0.0225	0.0029	−0.0002	0.0008	0.0019
	(0.17)	(3.75)***	(4.24)***	(2.42)**	(−0.15)	(0.78)	(2.51)**
SR × MB	0.0111	0.0237	0.0225	0.0132	0.0081	0.0129	0.0153
	(1.29)	(4.30)***	(4.24)***	(2.94)***	(1.95)*	(3.11)***	(5.87)***
SR × EFWA	0.0235	−0.0099	−0.0085	0.0005	−0.0062	−0.0098	−0.0017
	(2.78)***	(−1.60)	(−1.48)	(0.10)	(−1.23)	(−2.24)**	(−0.32)
R^2	0.47	0.46	0.44	0.41	0.43	0.48	
N	2,670	3,025	3,225	3,699	4,408	4,777	

* Significance at the 10% level.
** Significance at the 5% level.
*** Significance at the 1% level.

age presents different signs. In the case of firms with a lower performance the sign is negative. We suspect this occurs because we are in the presence of value firms – firms more likely to be under stress –, and it is therefore plausible that the higher the average number of analysts a country has the more likely it is that the overinvestment problems of a firm are analysed by them. Inflation presents, as in Panel A, non definitive results. Tangibility, sales and market-to-book, although revealing the expected signs, do not show a conclusive trend. On the contrary, EFWA exhibits a trend showing that the lower profitability a firm presents the more sensitive market leverage is going to be to this variable. Probably, less profitable firms need to retain more earnings in order to avoid difficulties when under stress and this will imply significant changes on EFWA.

Summing up, although there is much research left to be carried out, we must highlight that the impact of firm and country-level variables is not similar for all firms, particularly in the last ones. In fact, in this research paper we show, among other aspects, that the market leverage of small firms is particularly sensitive to the average number of analysts, and that the lower the profitability of a firm the stronger will be the impact of the corruption perception index on market leverage.

Table 6
Panel regression of leverage by country type. Developed markets exclude G7 countries. High shareholder rights means 4 or 5 in the scale of La Porta et al. (1998). Market leverage (D/A_{market}) is dependent variable. Tangibility (TANG) is defined as property, plant and equipment divided by total assets. Profitability (PROF) is defined as earnings before interest, taxes, depreciation, and amortisation divided by total assets. Size is defined as logarithm of sales. Market-to-book (M/B) is defined as the result of total assets minus book equity plus market capitalisation divided by total assets. External finance weighted average (EFWA) market-to-book depends on net equity issues and net debt issues. Liquidity ratio (LR) is defined as volume traded at a local stock exchange divided by GDP. Private credit (PC) is claims on private sector/GDP. SR and CR are shareholder and creditor rights. Law is a dummy variable: 1 common and 0 Civil. Corruption index (COR) is an index that ranges from 0 to 10, with larger value indicate a more severe corruption. Average number of analysts (ANA) in a country is taken from I\B\E\S Thomson Financial. Inflation rate (INF) is taken from World Development Indicators, World Bank. White cross-section *t*-statistics are in parenthesis. The panel data regressions, using year and industry fixed effects are defined by: $LEV_{i,t} = \alpha + b_1 Law_{i,t-1} + b_2 SR_{i,t-1} + b_3 CR_{i,t-1} + b_4 PC_{i,t-1} + b_5 LR_{i,t-1} + b_6 TANG_{i,t-1} + b_7 PROF_{i,t-1} + b_8 LN(Sales_{i,t-1}) + b_9 MB_{i,t-1} + b_{10} EFWA_{i,t-1} + u_{i,t}$.

	(1) French Law	(2) German Law	(2) Scandinavian Law	(2) Common Law	(1) High SR	(2) Low SR	(3) Developed Markets	(4) Emerging Markets	(5) All except Utilities	(5) All except Japan and USA	(6) All
Panel A: Sample variations											
SR	−0.0128	−0.0025	0.0298	−0.0439			−0.0213	−0.0409	−0.0686	−0.0559	−0.0660
	(−4.78)***	(−0.63)	(2.58)***	(−12.65)***			(−8.16)***	(−11.48)***	(−9.38)***	(−33.80)***	(−8.41)***
CR	0.0029	0.0688	0.0321	0.0138	−0.0086	0.0156	0.0015	0.0114	0.0067	0.0054	0.0058
	(1.11)	(5.85)***	(3.50)***	(4.00)***	(−3.87)***	(8.55)***	(0.50)	(2.58)***	(5.37)***	(4.28)***	(5.17)***
PC	−0.0617	−0.1107	0.0972	−0.0306	0.0681	−0.0076	−0.0285	0.0461	−0.0123	−0.0319	−0.0140
	(−3.63)***	(−5.26)***	(4.34)***	(−1.76)*	(6.55)***	(−1.09)	(−3.42)***	(2.36)**	(−2.49)**	(−5.41)***	(−2.71)***
LR	0.0086	0.0798	0.0431	0.0259	0.0075	0.0002	0.0064	0.0175	0.0118	0.0131	0.0113
	(1.20)	(11.66)***	(3.20)***	(10.22)***	(3.86)***	(0.05)	(1.27)	(1.83)*	(6.69)***	(3.62)***	(5.76)***
TANG	−0.0641	0.1151	0.1362	−0.0071	0.0056	0.0196	0.0127	−0.0702	0.0402	0.0674	0.0289
	(−3.90)***	(7.82)***	(4.68)***	(−0.79)	(0.70)	(1.50)	(0.79)	(−3.00)***	(1.87)*	(3.27)***	(1.33)
PROF	−0.8845	−1.2711	−0.8240	−0.5056	−0.7090	−0.8790	−0.7359	−0.8697	−1.1820	−1.0618	−1.1605
	(−20.77)***	(−30.52)***	(−10.90)***	(−23.72)***	(−35.74)***	(−27.09)***	(−16.93)***	(−15.58)***	(−21.19)***	(−19.46)***	(−19.65)***
SALES	0.0131	0.0139	0.0172	0.0182	0.0173	0.0146	0.0126	0.0201	0.0098	0.0121	0.0107
	(8.28)***	(10.80)***	(6.26)***	(18.82)***	(21.33)***	(11.95)***	(7.69)***	(6.93)***	(4.60)***	(5.97)***	(4.90)***
MB	−0.0874	−0.1042	−0.0983	−0.0894	−0.0864	−0.1272	−0.0966	−0.0846	−0.1537	−0.1655	−0.1605
	(−12.42)***	(−16.20)***	(−8.16)***	(−31.46)***	(−32.21)***	(−24.62)***	(−15.61)***	(−7.99)***	(−17.06)***	(−18.62)***	(−14.54)***
EFWA	−0.0827	−0.0903	−0.0627	−0.0539	−0.0623	−0.0453	−0.0526	−0.0853	−0.0380	−0.0302	−0.0358
	(−10.39)***	(−13.13)***	(−4.53)***	(−17.20)***	(−20.82)***	(−7.99)***	(−7.02)***	(−9.69)***	(−3.81)***	(−3.05)***	(−3.04)***
SR × TANG									−0.0083	−0.0256	−0.0053
									(−1.64)*	(−4.81)***	(−1.05)
SR × PROF									0.1073	0.1192	0.1028
									(8.24)***	(8.20)***	(7.34)***
SR × SALES									0.0016	0.0010	0.0014
									(3.14)***	(1.77)*	(2.73)***
SR × MB									0.0138	0.0163	0.0152
									(6.81)***	(7.06)***	(6.24)***
SR × EFWA									−0.0049	−0.0053	−0.0056
									(−2.19)**	(−2.05)**	(−2.12)**
Adj. R^2	0.47	0.45	0.48	0.41	0.44	0.46	0.42	0.48	0.45	0.45	0.45
N	3,242	6,223	1,036	11,303	16,217	5,587	3,371	1,688	21,036	16,745	21,804

Table 6 (*Continued*)

	(1) French Law	(2) German Law	(2) Scandinavian Law	(2) Common Law	(1) High SR	(2) Low SR	(3) Developed Markets	(4) Emerging Markets	(5) All except Utilities	(7) All except Japan and USA	(8) All
Panel B: Additional control variables											
SR	−0.0183	0.0060	−0.0405	0.0189			−0.0268	−0.0314	−0.0596	−0.0468	−0.0577
	(−6.47)***	(0.47)	(−2.43)**	(2.32)**			(−7.59)***	(−4.37)***	(−8.11)***	(−5.87)***	(−5.51)***
CR	−0.0053			−0.0029	0.0227	0.0128	0.0040	0.0039	0.0066	0.0034	0.0057
	(−1.88)*			(−0.69)	(6.83)***	(7.00)***	(0.92)	(−0.77)	(5.17)***	(2.64)***	(3.63)***
PC	0.0413	−0.1096	0.0766	0.1009	−0.0721	−0.0014	−0.0381	0.0801	−0.0036	−0.0195	−0.0057
	(1.66)*	(−5.20)***	(3.33)***	(4.21)***	(−4.74)***	(−0.18)	(−4.42)***	(3.50)***	(−0.68)	(−3.12)***	(−0.94)
LR	0.0507	0.0694	0.0708	0.0257	0.0332	0.0184	0.0174	0.0294	0.0175	0.0189	0.0177
	(5.58)***	(6.75)***	(4.58)***	(8.31)***	(11.56)***	(4.12)***	(2.79)***	(2.96)***	(8.50)***	(5.24)***	(3.51)***
ANA	−0.0045	0.0082	−0.0115	−0.0042	−0.0035	0.0013	−0.0015	−0.0055	−0.0005	0.0002	−0.0007
	(−6.47)***	(3.15)***	(−4.76)***	(−5.89)***	(−8.46)***	(3.35)***	(−2.66)***	(−4.83)***	(−1.93)*	(0.77)	(−1.63)
INF	−0.0194			−2.674	−1.6081	−0.0279	0.2081	−0.0285	−0.0347	−0.048	−0.0343
	(−0.68)			(−7.89)***	(−10.73)***	(−1.16)	(0.54)	(−0.84)	(−1.41)	(−2.06)**	(−1.02)
COR	0.0113	0.0455	0.1919	0.0423	0.0124	0.0183	0.0122	0.0198	0.0127	0.0134	0.0122
	(4.76)***	(5.33)***	(3.61)***	(8.54)***	(6.44)***	(14.46)***	(3.67)***	(3.04)***	(11.87)***	(12.79)***	(7.42)***
TANG	−0.0714	0.1146	0.1222	−0.005	0.007	0.0111	0.0174	−0.0482	0.0144	0.0481	0.0022
	(−4.35)***	(7.79)***	(4.19)***	(−0.56)	(0.88)	(0.86)	(1.08)	(−2.03)**	(0.67)	(2.34)**	(0.08)
PROF	−0.8502	−1.273	−0.8174	−0.5145	−0.6688	−0.8634	−0.7288	−0.9086	−1.1510	−1.0433	−1.1285
	(−19.70)***	(−30.55)***	(−10.87)***	(−24.15)***	(−33.50)***	(−26.84)***	(−16.78)***	(−15.87)***	(−20.46)***	(−19.09)***	(−15.28)***
SALES	0.0157	0.0138	0.0187	0.0185	0.0169	0.0158	0.0131	0.0193	0.0121	0.0142	0.0129
	(9.87)***	(10.72)***	(6.77)***	(19.07)***	(20.88)***	(13.00)***	(7.96)***	(6.48)***	(5.71)***	(7.01)***	(5.33)***
MB	−0.0845	−0.1039	−0.0940	−0.0887	−0.0846	−0.1136	−0.0969	−0.0797	−0.1360	−0.1502	−0.1432
	(−12.05)***	(−16.86)***	(−7.82)***	(−31.17)***	(−31.52)***	(−22.09)***	(−15.68)***	(−7.53)***	(−14.99)***	(−16.89)***	(−13.03)***
EFWA	−0.0883	−0.0899	−0.0689	−0.0552	−0.0626	−0.0568	−0.0506	−0.0822	−0.0512	−0.04	−0.0488
	(−11.02)***	(−13.06)***	(−4.97)***	(−17.60)***	(−21.00)***	(−10.10)***	(−6.75)***	(−9.39)***	(−5.12)***	(−4.05)***	(−4.20)***
SR × TANG									−0.0018	−0.0198	−0.0014
									(−0.36)	(−3.72)***	(−0.22)
SR × PROF									0.1047	0.1149	0.1002
									(8.01)***	(7.93)***	(5.58)***
SR × SALES									0.0010	0.0011	0.0018
									(2.01)**	(1.82)*	(1.85)*
SR × MB									0.0106	0.0137	0.0121
									(5.20)***	(5.96)***	(4.82)***
SR × EFWA									−0.0024	−0.0037	−0.0032
									(−1.29)	(−1.46)	(−1.29)
Adj. R^2	0.48	0.45	0.49	0.41	0.44	0.48	0.42	0.49	0.46	0.41	0.46
N	3,242	6,223	1,036	11,303	16,217	5,587	3,371	1,688	21,036	10,936	21,804

* Significance at the 10% level.
** Significance at the 5% level.
*** Significance at the 1% level.

Table 7
Panel regression of leverage by firm size and profitability. Market leverage (D/A_{market}) is a dependent variable. Tangibility (TANG) is defined as property, plant and equipment divided by total assets. Profitability (PROF) is defined as earnings before interest, taxes, depreciation, and amortisation divided by total assets. Size is defined as logarithm of sales. Market-to-book (M/B) is defined as the result of total assets minus book equity plus market capitalisation divided by total assets. External finance weighted average (EFWA) market-to-book depends on net equity issues and net debt issues. Liquidity ratio (LR) is defined as volume traded at a local stock exchange divided by GDP. Private credit (PC) is claims on private sector/GDP. SR and CR are shareholder and creditor rights. Corruption index (COR) is an index that ranges from 0 to 10, with larger value indicate a more severe corruption. Average number of analysts (ANA) in a country is from I\B\E\S Thomson Financial. Inflation rate (INF) is taken from World Development Indicators, World Bank. White cross-section t-statistics are in parenthesis. The panel data regressions, using year and industry fixed effects, are defined by: $LEV_{i,t} = \alpha + b_1 LAW_{i,t-1} + b_2 SR_{i,t-1} + b_3 CR_{i,t-1} + b_4 PC_{i,t-1} + b_5 LR_{i,t-1} + b_6 ANAb_{i,t-1} + b_7 INF_{i,t-1} + b_8 COR_{i,t-1} + b_9 TANG_{i,t-1} + b_{10} PROF_{i,t-1} + b_{11} MB_{i,t-1} + b_{12} EFWA_{i,t-1} + u_{i,t}$.

	(1) Smallest	(2) 2° quartile	(3) 3° quartile	(4) Largest
Panel A: Robustness tests of firm-level regression of leverage by firm size				
SR	−0.0258	−0.0193	−0.0200	−0.0153
	(−11.39)***	(−8.82)***	(−10.17)***	(−7.82)***
CR	−0.0113	0.0123	0.0152	0.0143
	(−4.58)***	(4.89)***	(4.87)***	(5.65)***
PC	0.0604	−0.0229	−0.0363	−0.0614
	(5.74)***	(−2.26)**	(−3.68)***	(−5.74)***
LR	0.0064	0.0200	0.0182	0.0235
	(1.24)	(4.87)***	(2.45)***	(6.73)***
ANA	−0.0019	−0.0006	0.0006	0.0001
	(−3.15)***	(−1.11)	(0.90)	(0.12)
INF	−0.0672	−0.0542	−0.1366	−0.1191
	(−1.61)	(−1.18)	(−2.22)**	(−1.68)*
COR	0.0139	0.0157	0.0121	0.0146
	(8.06)***	(7.22)***	(4.22)***	(6.22)***
TANG	0.0634	0.0375	0.0187	−0.0614
	(4.15)***	(2.66)**	(0.84)	(−4.69)***
PROF	−0.4962	−0.7852	−0.8702	−1.0368
	(−15.22)***	(−23.14)***	(−15.23)***	(−25.29)***
MB	−0.0851	−0.0726	−0.0967	−0.0909
	(−17.06)***	(−15.58)***	(−15.42)***	(−17.80)***
EFWA	−0.0608	−0.0735	−0.0579	−0.0543
	(−10.91)***	(−14.33)**	(−11.33)***	(−8.32)**
Adj. R^2	0.36	0.45	0.50	0.53
N	5,451	5,451	5,451	5,451
	(1) Low prof	(2) 2° quartile	(3) 3° quartile	(4) High prof
Panel B: Robustness tests of firm-level regression of leverage by profitability				
SR	−0.0301	−0.0219	−0.0197	−0.0165
	(−9.83)***	(−10.13)***	(−11.05)***	(−9.69)***
CR	0.0059	0.0087	0.0058	0.0084
	(1.79)*	(3.42)***	(2.68)***	(4.13)***
PC	−0.0260	−0.0648	−0.0409	0.0051
	(−1.81)*	(−6.28)***	(−4.59)***	(0.55)
LR	0.0304	0.0243	0.0286	0.0049
	(5.83)***	(6.13)***	(8.21)***	(1.37)
ANA	−0.0024	0.0024	0.001	0.0001
	(−3.51)***	(4.76)***	(2.38)**	(0.27)
INF	−0.447	−0.1558	−0.0435	0.0224
	(−4.91)***	(−1.64)	(−0.72)**	(0.75)
COR	0.0202	0.0157	0.0090	0.0060
	(7.11)***	(7.21)***	(4.99)***	(3.01)***
TANG	0.0051	0.0598	0.0254	0.0571
	(0.35)	(4.42)***	(2.01)**	(4.14)***

Table 7 (*Continued*)

	(1) Smallest	(2) 2° quartile	(3) 3° quartile	(4) Largest
SALES	0.0250	0.0161	0.0075	0.0102
	(17.49)***	(12.14)***	(5.76)***	(8.77)***
MB	−0.1007	−0.1240	−0.1274	−0.0739
	(−16.86)***	(−19.89)***	(−24.03)***	(−25.11)***
EFWA	−0.0797	−0.0777	−0.0600	−0.0402
	(−13.21)***	(−12.58)**	(−10.79)***	(−10.97)***
Adj. R^2	0.37	0.32	0.35	0.37
N	5,451	5,451	5,451	5,451

* Significance at the 10% level.
** Significance at the 5% level.
*** Significance at the 1% level.

6. Conclusion

Our analysis of the determinants of the capital structure of firms considers different institutional environments. We have used a panel of firms from 31 countries with different legal systems, shareholder and creditor rights and banking and capital market development. Our main objective has been to see how the institutional environment is related to internal variables—tangibility, profitability, size, market-to-book, and external finance weighted average. Our particular contribution is our novel analysis of market timing in an international context.

We have shown that shareholder rights, in general, – even controlling, creditor rights, legal systems, capital market development, banking development, corruption index, average number of analysts, and inflation – are an important determinant of capital structure. Thus, we would like to stress governments and public agencies take this variable into serious account. It is currently agreed that the value created by firms is not independent of their capital structure. In this respect, we would also emphasise the importance of transparency levels. In our research, we have found that in general there is a positive relationship between corruption levels presented by countries and the use of debt by firms. It is well known that, on average, equity has historically presented higher returns (or creation of wealth) in comparison with debt. Any subsequent research should consider the relationship between the creation of wealth and the optimal capital structure of firms, considering different transparency levels.

Our results confirm that the impact of firm-level variables and country level variables on market leverage is not the same in all countries. However, it seems that the results concerning firm-level variables are more regular around the world.

Size seems to be a common determinant of capital structure around the world. Nevertheless, it appears that leverage is more sensitive to size (as a proxy for bankruptcy costs) in countries where shareholders are better protected. Firms placed in Civil Scandinavian regimes, on the contrary, are the least sensitive to size.

Profitability, more than any other firm characteristic, seems to be a common determinant around the world. In 25 countries (see Appendix A) from the sample this variable plays an important role as a determinant of leverage. The Pecking order theory of Myers (1984) and Myers and Majluf (1984) and its relationship with the protection of shareholders is strengthened in this research paper, regardless of the countries, or the size of the firms analysed. Simply put, the relationship between asymmetric information costs (proxied by profitability) and leverage is more pronounced in countries where shareholders are not well protected. This suggests that the more shareholder rights there are, the fewer asymmetric problems occur.

On the other hand, tangibility seems to be more related with short- and long-term debt to assets than with book and market leverage. The higher shareholder rights are the lower is the impact of collateral assets on long-term (and short-term) debt to assets. This occurs because creditor rights or shareholder rights are positively related, and the conflict of interests between shareholders and creditholders is reduced under those circumstances.

Market-to-book and external finance weighted average market-to-book are observable respectively in 22 and 23 countries (see Appendix A). Regarding these variables, this does not mean that both variables explain different theories, namely market timing. We prefer the explanation offered by Hovakimian (2006) that EFWA contains information about a firm's growth opportunities not observed by current market-to-book.

Finally, when a firm's size and profitability are controlled, the impact of country-level variables is not the same for all firms. We emphasise the average number of analysts and the corruption perception index. An average number of analysts is particularly important for small firms. In general, there is less information about small firms. The larger the number of analysts following a small firm the higher the probability is that such firm issues equity. On the other hand, the higher profitability a firm presents, the less sensitive market leverage is to the corruption perception index.

Appendix A.

See Tables A1 and A2.

Table A1
Number of firms by industry and country.

	Basic Industries	Cyclical Consumer Goods	Cyclical Services	General Industries	Information Technologies	Non Cyclical Services	Non Cyclical Consumer Goods	Resources	Utilities	
Civil French law countries										
Belgium	9		5	4		1	5	1	1	26
Brazil	5	4		6	1	1	5	1	2	25
Chile	12	1	5	6		4	12	3	11	54
France	34	40	53	41	20	6	53	7	2	256
Indonesia	24	15	9	5	5	5	17	4		84
Italy	18	21	12	15	3	1	7	2	6	85
Mexico	7	3	8	6		3	6			33
Netherlands	13	10	14	20	7	7	10	2		83
Philippines	4	1	7	3		3	5	7	1	31
Portugal	14	3	5	2	1	5	4		1	35
Spain	18	4	9	11	2	3	11	4	5	67
Turkey	8	10	1	1	2		3	2	1	28
Total	166	112	128	120	41	39	138	33	30	807
% Total	20.6%	13.9%	15.9%	14.9%	5.1%	4.8%	17.1%	4.1%	3.7%	
Civil German law countries										
Germany	52	57	40	60	3	3	36	1	10	262
Japan	367	167	225	316	54	23	137	19	11	1319
South Korea	26	11	7	12	2		13	3	1	75
Switzerland	16	7	15	31	4	3	15		8	99
Total	461	242	287	419	63	29	201	23	30	1755
% Total	26.3%	13.8%	16.4%	23.9%	3.6%	1.7%	11.5%	1.3%	1.7%	
Civil Scandinavian law countries										
Denmark	16	15	10	16	3	2	10		1	73
Finland	12	8	12	15	4	4	7		1	63
Norway	4	1	13	6	2			3	1	30
Sweden	18	10	16	24	11	2	10	2		93
Total	50	34	51	61	20	8	27	5	3	259
% Total	19.3%	13.1%	19.7%	23.6%	7.7%	3.1%	10.4%	1.9%	1.2%	
Common law countries										
Australia	9	9	26	16		2	19	32	3	116
Canada	33	11	37	16	11	13	20	39	10	190
Hong Kong	12	21	30	24	6	2	6		2	103
Ireland	6	2	4				5	1		18

Table A1 (*Continued*)

	Basic Industries	Cyclical Consumer Goods	Cyclical Services	General Industries	Information Technologies	Non Cyclical Services	Non Cyclical Consumer Goods	Resources	Utilities	
Malaysia	15	7	8	10		1	10	4		55
New Zealand	1	3	13	1		1	4		2	25
Singapore	5	5	15	16	2	2	2			47
South Africa	10	2	18	7		1	5	8		51
Thailand	19	19	11	1	3	1	21	3		78
UK	71	51	193	91	41	11	61	18	15	552
USA	171	172	350	287	193	60	246	90	79	1648
Total	352	302	705	469	256	94	399	195	111	2883
% Total	12.2%	10.5%	24.5%	16.3%	8.9%	3.3%	13.8%	6.8%	3.9%	
Total	1029	690	1171	1069	380	170	765	256	174	5704
% Total	18.0%	12.1%	20.5%	18.7%	6.7%	3.0%	13.4%	4.5%	3.1%	

Table A2
Panel regression of leverage by country. Market leverage (D/A_{market}) is dependent variable. Tangibility (TANG) is defined as property, plant and equipment divided by total assets. Profitability (PROF) is defined as earnings before interest, taxes, depreciation, and amortisation divided by total assets. Size is defined as logarithm of sales (SALES). Market-to-book (M/B) is defined as the result of total assets minus book equity plus market capitalisation divided by total assets. External finance weighted average (EFWA) market-to-book depends on net equity issues and net debt issues. The cross-sectional regression is estimated using the year fixed effects: $LEV_{i,t} = \alpha + b_1 TANG_{i,t-1} + b_2 PROF_{i,t-1} + b_3 LN(Sales_{i,t-1}) + b_4 MB_{i,t-1} + b_5 EFWA_{i,t-1} + u_{i,t}$.

Country	TANG	PROF	SALES	MB	EFWA	*N*	Adj. R^2
Belgium	0.1399	−1.7914	0.0238	−0.0529	−0.045	113	0.56
	(0.91)	(−5.16)***	(1.58)	(−1.33)	(−1.04)		
Brazil	−0.3130	−0.2647	0.0116	0.0400	−0.5750	56	0.2
	(−2.67)**	(−1.18)	(0.44)	(0.27)	(−3.14)***		
Chile	−0.0935	−0.3400	0.0287	−0.0669	−0.1024	227	0.31
	(−1.48)	(−1.58)	(3.58)***	(−1.79)*	(−3.48)***		
Denmark	0.1672	−0.7031	0.0365	−0.1653	−0.0279	309	0.48
	(3.35)***	(−5.00)***	(7.17)***	(−7.41)***	(−1.02)		
Finland	0.0837	−1.0663	0.0016	−0.0986	−0.0867	263	0.48
	(1.83)*	(−7.41)***	(0.23)	(−3.47)***	(−2.45)***		
France	0.0041	−0.9553	0.0089	−0.0877	−0.1015	1.053	0.52
	(0.13)	(−11.21)***	(3.27)***	(−6.07)***	(−6.34)***		
Germany	0.0212	−0.6412	0.0093	−0.194	−0.0443	1.118	0.5
	(0.76)	(−10.40)***	(3.82)***	(−14.73)***	(−2.93)***		
Indonesia	−0.0557	−1.0100	0.0389	−0.1210	−0.0650	288	0.42
	(−1.15)	(−7.28)***	(4.56)***	(−4.44)***	(−2.16)**		
Italy	0.0435	−0.9867	0.0448	−0.1047	−0.0410	370	0.52
	(0.83)	(−6.82)***	(9.32)***	(−3.41)***	(−0.99)		
Japan	0.1805	−1.8744	0.0161	−0.1072	−0.1030	4.526	0.41
	(10.56)***	(−27.26)***	(9.73)***	(−12.99)***	(−12.57)***		
Mexico	−0.2880	−0.7306	−0.0231	−0.0528	−0.3058	138	0.57
	(−3.55)***	(−2.71)***	(−1.97)*	(−1.23)	(−7.19)***		
Netherlands	−0.0172	−0.7353	0.0009	−0.0990	−0.0276	371	0.49
	(−0.36)	(−4.69)***	(0.18)	(−5.74)***	(−1.52)		
Norway	0.0685	−0.3251	0.0228	−0.0699	−0.1261	103	0.54
	(0.78)	(−1.38)	(2.32)**	(−1.59)	(−2.53)**		
Philippines	0.1391	−0.1582	0.0421	−0.1427	−0.1301	71	0.54
	(1.23)	(−0.63)	(2.79)***	(−3.28)***	(−4.68)***		
Portugal	−0.3434	−1.1183	−0.0023	−0.0866	−0.0986	142	0.49
	(−3.46)***	(−3.99)***	(−0.27)	(−1.58)	(−1.41)		
South Korea	−0.0219	−1.0130	0.0170	−0.1242	0.1296	171	0.28
	(−0.34)	(−5.18)***	(2.34)**	(−1.18)	−0.92		
Spain	−0.1988	−0.8715	0.0248	−0.0670	−0.1135	324	0.55
	(−4.64)***	(−4.78)***	(5.28)***	(−2.69)***	(−4.25)***		
Sweden	0.1316	−0.9176	0.0088	−0.0830	−0.0464	361	0.48
	(1.89)*	(−6.15)***	(1.93)**	(−4.69)***	(−2.78)***		
Switzerland	−0.0615	−0.864	−0.0072	−0.1138	−0.0049	408	0.46
	(−1.48)	(−5.55)***	(−1.44)	(−5.50)***	(−0.17)		
Turkey	−0.3670	−0.3048	0.0211	−0.01463	−0.1031	89	0.35
	(−2.96)***	(−1.55)	(2.94)***	(−0.43)	(−3.24)***		
Panel B: Common law countries							
Australia	−0.1101	−0.2308	0.0113	−0.1036	−0.0326	469	0.28
	(3.07)***	(−2.10)**	(2.49)**	(−7.24)***	(−1.68)*		
Canada	−0.0680	−0.3031	0.0185	−0.1147	−0.0793	798	0.37
	(−2.20)**	(−2.79)***	(4.05)***	(−7.30)***	(−5.46)***		
Hong Kong	0.0866	−0.2334	0.0348	−0.0759	−0.1582	211	0.43
	(1.16)	(−1.29)	(2.98)***	(−2.82)***	(−5.76)***		
Ireland	−0.0041	−0.8121	0.0128	−0.0127	−0.1233	88	0.39
	(−0.05)	(−2.66)***	(0.85)	(−0.38)	(−3.15)**		
Malaysia	0.166	−1.3174	0.0202	−0.0022	−0.1404	138	0.51
	(2.42)**	(−7.88)***	(1.75)*	(−0.08)	(−4.02)***		
New Zealand	0.1214	−1.1069	0.0164	−0.0949	0.0283	79	0.32
	(1.16)	(−3.47)***	(0.62)	(−2.27)**	(0.79)		

Table A2 (*Continued*)

Country	TANG	PROF	SALES	MB	EFWA	*N*	Adj. R^2
Singapore	0.0752	−0.9153	0.0603	−0.0856	−0.0718	130	0.37
	(0.87)	(−5.16)***	(6.10)***	(−2.49)***	(−1.77)*		
South Africa	−0.2275	−0.8563	0.0120	−0.0701	−0.0734	244	0.48
	(−3.64)***	(−4.35)***	(0.90)	(−2.28)**	(−2.91)***		
Thailand	0.0202	−1.2314	0.0230	−0.1348	−0.0407	266	0.29
	(0.34)	(−7.34)***	(1.99)**	(−3.68)***	(−2.63)***		
UK	−0.1029	−0.4122	0.0173	−0.0934	−0.0337	2.538	0.39
	(−6.50)***	(−9.68)***	(10.12)***	(−16.05)***	(−4.77)***		
US	0.0333	−0.5378	0.0202	−0.0961	−0.0621	6.342	0.41
	(3.01)***	(−17.30)***	(14.79)***	(−25.05)***	(−14.19)***		

* Significance at the 10% level.
** Significance at the 5% level.
*** Significance at the 1% level.

References

Alti, A., 2003. How persistent is the impact of market timing on capital structure? In: AFA 2005 Philadelfia Meetings.

Antoniou, A., Guney, Y., Paudyal, K., 2002. Determinants of corporate capital structure: evidence from European countries. In: EFMA 2002 London Meetings.

Baker, M., Wurgler, J., 2002. Market timing and capital structure. Journal of Finance 57, 1–32.

Bevan, A., Danbolt, J., 2000. Capital structure and its determinants in the United Kingdom: a decompositional analysis. Working Paper, University of Glasgow.

Bevan, A., Danbolt, J., 2002. Capital structure and its determinants in the United Kingdom – a decompositional analysis. Applied Financial Economics 12, 159–170.

Booth, L., Aivazian, V., Demirgüç-Kunt, A., Maksimovic, V., 2001. Capital structures in developing countries. Journal of Finance 56, 87–130.

Bradley, M., Jarrel, G., Kim, E., 1984. On the existence of an optimal capital structure: theory and evidence. Journal of Finance 39, 857–878.

Chiarella, C., Pham, T., Tan, M., 1992. Determinants of corporate capital structure: Australian evidence. Pacific Basin Capital Markets Research 3, 139–158.

Chittenden, F., Hall, G., Hutchinson, P., 1996. Small firm growth. Access to capital markets and financial structure: review of issues and empirical investigation. Small Business Economics 8, 59–67.

Claessens, S., Djankov, S., Nenova, T., 2001. Corporate risk around the world. Working Paper, World Bank Policy Research.

DeAngelo, H., Masulis, R., 1980. Optimal capital structure under corporate and personal taxation. Journal of Financial Economics 8, 3–29.

De Jong, A., Kabir, R., Nguyen, T., 2006. Capital structure around the world: the roles of firm- and country-specific determinants. EFA 2006 Zurich Meetings Paper.

Demirgüç-Kunt, A., Levine, R., 1999. Bank-based and market-based financial systems: cross country comparisons. Working Paper, World Bank Policy Research.

Demirgüç-Kunt, A., Maksimovic, V., 1996. Stock market development and financing choices of firms. World Bank Economic Review 10, 341–369.

Demirgüç-Kunt, A., Maksimovic, V., 1998. Law, finance and firm growth. Journal of Finance 53, 2107–2137.

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

Fama, E., MacBeth, J., 1973. Risk, return and equilibrium: empirical tests. Journal of Political Economy 71, 607–636.

Fan, J., Titman, S., Twite, G., 2011. An International Comparison of Capital Structure and Debt Maturity Choices. Journal of Financial and quantitative Analysis, forthcoming.

Fan, J., Titman, S., Twite, G., 2006. An international comparison of capital structure and debt maturity choices. In: AFA 2005 Philadelphia Meetings.

Frank, M., Goyal, V., 2003. The Effect of Market Conditions on Capital Structure Adjustment, SSRN: http://ssrn.com/abstract=467081.

Giannetti, M., 2003. Do better institutions mitigate agency problems? Evidence from corporate finance choices. Journal of Financial and Quantitative Analysis 38, 185–212.

Hausman, J., 1978. Specifications tests in econometrics. Econometrica 46, 1251–1271.

Hirota, S., 1999. Are corporate financing decisions different in Japan? An empirical study on capital structure. Journal of the Japanese and International Economies 13, 201–229.

Hovakimian, A., 2006. Are Observed capital structures determined by equity market timing? Journal of Financial and Quantitative Analysis 41, 221–243.

Hovakimian, A., Opler, T., Titman, S., 2001. The debt-equity choice. Journal of Financial and Quantitative Analysis 36, 1–24.

Jensen, G., Solberg, D., Zorn, T., 1992. Simultaneous determination of insider ownership, debt and dividend policies. Journal of Financial and Quantitative Analysis 27, 247–261.

Jensen, M, 1986. Agency costs of free cash flow, corporate finance and takeovers. American Economic Review 76, 323–329.

Jensen, M., Meckling, W., 1976. Theory of the firm: managerial behavior, agency costs and ownership structure. Journal of Financial Economics 3, 305–360.

Kim, E, 1978. A mean-variance theory of optimal capital structure and corporate debt capacity. Journal of Finance 33, 45–63.
Kraus, A., Litzenberger, R., 1973. A state-preference of optimal capital structure and corporate debt capacity. Journal of Finance 33, 45–63.
La Porta, R., de Silanes, F., Shleifer, A., Vishny, R., 1997. Legal determinants of external finance. Journal of Finance 52, 1131–1150.
La Porta, R., de Silanes, F., Shleifer, A., Vishny, R., 1998. Law and finance. Journal of Political Economy 106, 1113–1155.
La Porta, R., de Silanes, F., Shleifer, A., 1999. Corporate ownership around the world. Journal of Finance 54, 471–517.
Lee, J., Lee, Y., Lee, B., 2000. The determination of corporate debt in Korea. Asian Economic Journal 14, 333–356.
Levine, R., Zervos, S., 1998. Stock markets, banks, and economic growth. American Economic Review 88, 537–558.
Marsh, P, 1982. The choice between equity and debt: an empirical study. Journal of Finance 37, 121–144.
Modigliani, F., Miller, M., 1958. The cost of capital, corporation finance and the theory of investment. American Economic Review 48, 261–297.
Modigliani, F, Miller, M., 1963. Corporate income taxes and cost of capital: a correction. American Economic Review 48, 433–443.
Myers, S., 1977. Determinants of corporate borrowing. Journal of Financial Economics 5, 147–175.
Myers, S., 1984. The capital structure puzzle. Journal of Finance 39, 574–592.
Myers, S., Majluf, N., 1984. Corporate financing and investment decisions when firms have information that investors do not have. Journal of Financial Economics 13, 187–221.
Pagano, M., Panetta, F., Zingales, L., 1998. Why do companies go public? An empirical analysis. Journal of Finance 53, 27–64.
Rajan, R., Zingales, L., 1995. What do we know about capital structure? Some evidence from international data. Journal of Finance 50, 1421–1460.
Rajan, R., Zingales, L., 1998. Financial dependence and growth. American Economic Review 88, 559–586.
Rajan, R., Zingales, L., 2003. The great reversals: The politics of financial development in the 20th century. Journal of Financial Economics 69, 5–50.
Ritter, J., 1991. The long-run performance of initial public offerings. Journal of Finance 42, 3–27.
Scott, J., 1976. A theory of optimal capital structure. Bell Journal of Economics 7, 33–54.
Shenoy, C., Koch, P., 1996. The firm's leverage-cash flow relationship. Journal of Empirical Finance 2, 1–19.
Titman, S., Wessels, R., 1988. The determinants of capital structure choice. Journal of Finance 43, 1–43.
Warner, J., 1977. Bankrupcy costs: some evidence. Journal of Finance 32, 337–347.
Wijst, N., Thurik, R., 1993. Determinants of small firm debt ratios: an analysis of retail panel data. Small Business Economics 5, 55–65.
Wurgler, J., 2000. Financial markets and the allocation of capital. Journal of Financial Economics 58, 187–214.