CORPORATE CAPITAL STRUCTURE CHOICES IN MENA: EMPIRICAL EVIDENCE FROM NON-LISTED FIRMS IN MOROCCO

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Based on their perceptions, more than three quarters of Moroccan manufacturing firms have identified access to finance as one of the major constraints affecting their performance. However, compared to a number of emerging countries, Moroccan firms appear relatively undercapitalized and more reliant on external finance. These two findings seem contradictory and have very different policy implications. The purpose of this paper is to provide a rigorous understanding of the rationale behind financial choices made by Moroccan firms, and assess the severity of financial constraints they effectively face. The paper uses a panel dataset covering 550 non-listed manufacturing firms over the period 1998–2003 and investigates both long-term and short-term measures of leverage with the objective of understanding the factors that shape "debt-equity choice" as well as "debt maturity structure".

Our analysis reveals the existence of a negative relationship between asset tangibility and both aggregate leverage and short-term debt ratio. However, no clear cut relationship between asset tangibility and long-term debt is uncovered. Small firms tend to increase their debt instead of opening their capital to outside investors and larger firms seem to rely much more on their retained earnings for their long-term financial needs. For short-term debt, size does not appear to matter. The impact of growth is positive on short-term leverage and irrelevant for long-term leverage. Finally, profitability exerts a positive effect on long-term leverage and a negative one on short-term leverage.

Keywords: Financial structure; debt-equity choice; debt maturity issue; manufacturing firms.

1. Introduction

The purpose of this paper is to empirically investigate the determinants of financial structure in non-listed firms in a developing country, namely Morocco, using a panel data approach. The paper investigates long-term and short-term measures of leverage with the objective of understanding the factors behind shaping "debt-equity choice" as well as "debt maturity structure" in the context of non-listed manufacturing firms. The issue is of high relevance for both academic research and policy-making.

From an academic point of view, there is a relatively vast body of theory-derived literature relating corporate capital structure to firm and industry characteristics. However, most studies use data on listed companies, and frequently focus on developed countries. Only a limited amount of research has focused on developing countries largely because of data constraints and therefore there is an important knowledge gap that needs to be tackled.

Moreover, there are valid reasons to expect that capital structure decisions of non-listed firms are shaped by different factors compared to listed firms. This is particularly the case in developing countries where capital markets are less developed, the range of financial instruments available to non-listed firms is relatively narrow, and the lack of rigorous accounting standards and audit controls create higher information asymmetry among stakeholders (Cobham and Subramaniam 1998). Using firm level data on business environment across 80 countries, Ayyagari *et al.* (2005) show that access to finance is the most robust factor that has a direct impact on firms' growth. Various other studies suggest that financing obstacles faced by small and medium-sized enterprises translate into slower growth (Beck *et al.* 2005, Beck and Demirguç-Kunt 2006).

From a policy-making point of view, the paper is expected to provide a more rigorous understanding of the rationale behind financial choices made by Moroccan manufacturing firms, and assess the severity of financial constraints they effectively face. Based on their perceptions, more than three-quarters of Moroccan manufacturing firms have identified access to finance as one of the major constraints affecting their performance (ICA survey[a] 2004). However, a large cross sectional survey conducted in 48 countries (Beck *et al.* 2008) reveals that compared to firms in emerging countries such as Turkey, Egypt, Mexico, Jordan, Poland and Argentina, Moroccan firms appear relatively undercapitalized and more reliant on external finance.

Thanks to a panel dataset covering some 550 firms over the period 1998–2003, we are able to extend the existing empirical work on the determinants of financial structure to non-listed manufacturing firms in the specific context of a developing MENA country, namely Morocco. In addition, we investigate both long-term and short-term measures of leverage with the objective of understanding the factors that shape "debt-equity choice" as well as "debt maturity structure".

The rest of the paper proceeds as follows. Section 2 examines the main findings of previous empirical work on leverage determinants and their relevance for non-listed firms. Section 3 describes data sources and analyzes typical balance sheets of non-listed firms in the Moroccan manufacturing sector. Section 4 presents the econometric approach, and discusses the main empirical results. It also compares and contrasts long-term and short-term determinants of leverage behavior. Finally, Sec. 5 sums up the main findings and draws their policy implications.

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[a]ICA stands for *Investment Climate Assessment*, which is a firm level survey implemented in collaboration with the World Bank. ICA is a broad survey that covers firm's activity, organization, its inputs and outputs, infrastructure and services, finance, labor and training, regulation and conflict resolution.

2. Literature Review

The theoretical background underpinning the literature on corporate capital structure dates back to Modigliani and Miller (1958) for whom the value of a company is independent of its capital structure in a perfect capital market. Therefore, the issue of optimal capital structure is irrelevant. Since then, economists have developed a number of theories to explain variation in debt ratios across firms by accounting for the implications of capital market imperfections. From the perspective of non-listed companies, Modigliani and Miller's argument does not seem appropriate for at least three reasons. First, non-listed companies have access to a limited range of financial instruments to adjust their current leverage to their desired level. Second, non-listed firms are generally held by a single owner or by members of the same family and likely to be reluctant to open their business to outsiders. Third, even if they decide to open their capital, it would not be easy to convince potential investors to acquire a stake in unlisted family businesses.[b]

The agency cost model initiated by Jensen and Meckling (1976) postulates that shareholder-manger conflict plays a key role in shaping capital structure decisions. Managers have different incentives in comparison with owners, which may lead them to waste the firm's free cash flow. Therefore, the advantage of debt is to reduce free cash flow available to managers. However, the agency cost model does not really fit with the situation of non-listed firms. Owners of this category of firms are very likely to be also involved in their management,[c] and hence the shareholder-manager conflict is less relevant to explain their financial structure.

The trade-off theory suggests that firms target an optimal level of leverage to balance the benefits and costs of debt financing. The main benefit of debt is its tax deductibility by firms. It therefore pays to borrow as long as a firm has taxable profits. However, the costs of financial distress (Myers 2001) impose limits on the optimal level of debt targeted by a firm. The costs can be direct out-of-pocket expenses or indirect such as the reluctance of suppliers to deal with firms in financial distress. This aspect is crucial for non-listed firms for which credit extended by suppliers generally represents a key source of short-term finance. Furthermore, trade-off theory fails to explain why firms with higher profitability are often characterized by low debt levels (Rajan and Zingales 1995).

The pecking order model developed by Myers and Majluf (1984) provides such an explanation. It argues that profitable firms, which generate sufficient cash flows to meet their capital needs, use their retained earnings first. They opt for debt as their second choice. Additional equity finance is used as a source of last resort. Holmes and Kent (1991) argue that leverage decisions of non-listed firms tend to be shaped by the pecking order theory for two reasons. First, their access to appropriate

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[b]We would like to thank an anonymous referee for suggesting this caveat of the Modigliani and Miller's paradigm in the specific context of non-listed family firms.
[c]For instance, our data on non-listed Moroccan manufacturing firms indicate that in 89% of cases, there is no separation between ownership and control.

external sources of capital is limited. Second, their cost of capital is generally high due to asymmetrical information in credit markets. In order to circumvent these constraints, non-listed firms often tend to rely primarily on their internal sources of funding.

From an empirical point of view, there is a relatively vast body of theory-derived literature relating corporate capital structure to firm and industry characteristics. However, most studies use data on listed companies, and frequently focus on developed countries. For example Titman and Wessels (1988) focused on American firms, Rajan and Zingales (1995) and Aggrawal and Jamdee (2003) investigated the determinants of capital structure in the G-7 countries.

On the other hand, very few papers have dealt with the same issue in developing countries. Glen and Pinto (1994) found that unlike firms in G7 countries, firms in developing countries rely more substantially on externally generated funds. Booth *et al.* (2001) examined capital structure in 10 developing countries, two of which were from MENA (Jordan and Turkey).[d] Their findings indicated that, overall, capital structure choices in developing countries are affected by the same variables as in developed countries. Finally, Agarwal and Mohtadi (2004) focused on the impact of financial sector size and structure of debt-equity ratios in 21 developing countries. However, in all these cases, only listed firms were covered.

3. Data and Descriptive Analysis

3.1. *Data sources*

Financial variables used in the paper are expressed in book values and drawn from balance sheets and income statements of a sample made from 550 Moroccan manufacturing firms over the period 1998–2003. It is important to mention that the same firms are tracked over the five-year period. To obtain this sample we had to merge two separate but consistent databases.[e] The first relies on data collected in 2000 under FACS (*Firm Analysis and Competitiveness Survey*). The second is based on data collected in 2004 under ICA (*Investment Climate Survey*). Both surveys are jointly conducted by the Moroccan Ministry of Industry and the World Bank.

To our knowledge, this is the most comprehensive dataset on financial variables that has ever been constructed on the manufacturing sector in Morocco. Nevertheless, we checked the data for consistency to detect potential outliers on the basis of accounting rules and logical relationships.[f]

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[d]Countries covered by Booth *et al.* (2001) included: Brazil, Mexico, India, South Korea, Jordan, Malaysia, Pakistan, Thailand, Turkey and Zimbabwe.
[e]Each firm has a unique code used in both databases.
[f]We checked for consistency within each accounting period using accounting rules such as (total assets = total debt + total equity). We also checked for consistency from one period to the other by looking at the annual changes on aggregates, such as output, employment, and total sales; also available from the annual manufacturing survey data. We had to remove some 30 firms from our database due to their numbers that were very unlikely. Overall, and from a pure statistical point

3.2. *Descriptive analysis*

The purpose of this section is to provide a brief descriptive analysis of sources of funds among manufacturing firms in Morocco. Although more than thirty items are included in the database, we perform a certain amount of aggregation in order to focus on the respective importance of the main components. Data are averaged to provide the liability side of the balance sheet for a hypothetical firm with the mean characteristics of the sample. The results are presented in Table 1 for the first and the last available years in our dataset, namely 1998 and 2003. The last column of Table 1 reports, for each component, the average over the six-year period.

The share of equity, which represents the amount of money initially invested by owners plus any retained earnings, stands at 37% over the period under study. It increases from around 32% in 1998 to more than 40% in 2004 due mainly to the drastic jump recorded in retained earnings. The share of the latter in total financing more than tripled in six years, going up from 4.9% in 1998 to 16.7% in 2003. Retained earning is an accumulated number, with each year's retained earnings being added to the amount from prior years. Although it is natural for firms to have a larger pool of retained earnings relative to total equity as they become older, the increase recorded in our case is also explained by the decision in 1997 by the government to exempt up to 20% of profits retained for investment purposes. Thus, Moroccan firms appear to be sensitive to fiscal incentives in their trade-offs between equity and debt.

Debt, on the other hand, seems to play a central role in the capital structure of the Moroccan manufacturing sector. This is particularly the case for short-term debt (current liabilities), which accounts for roughly the equivalent of half of total

Table 1. Financial structure of Moroccan non-listed manufacturing firms.

	1998	2003	Average 1998–2003
Total equity	**31.9**	**40.4**	**37.0**
Capital	27.0	23.7	25.0
Retained earnings	4.9	16.7	12.0
Long-term debt	**13.0**	**13.6**	**14.1**
Short-term debt	**55.2**	**46.0**	**48.9**
Accounts payable	*37.0*	*35.1*	*33.4*
Credit to suppliers	21.1	23.1	18.9
Other short-term creditors	15.9	12.0	14.5
Short-term bank loans	*18.2*	*10.9*	*15.5*
Total liabilities and equity	**100**	**100**	**100**

Source: Moroccan FACS (Firm Analysis and Competitiveness Survey) and ICA (Investment Climate Assessment) carried out respectively in 2000 and 2004.

view, our dataset seems to be of good quality. The issue of credibility of accounting reporting goes beyond the scope of this paper.

firms' assets over the period 1998–2003. Long-term debt, on the other hand, appears to be of limited contribution as its share does not exceed 14%.

But how does the financial structure of Moroccan firms compare with their counterparts in other countries?

Booth *et al.* (2001) reported debt ratios for 17 countries (10 developing and 7 developed countries). For developed countries, debt ratios ranged between 54% (UK) and 73% (Germany). For developing countries, debt ratios were globally lower and ranged between 30% in Brazil and a surprising 73% in South Korea. Regarding long-term debt, it appears that its share in developed countries is much more important compared to short-term debt; it varied between 28% in the UK and 53% in Japan. Conversely, in developing countries short-term debt exceeded long-term with the exception of South Korea and India. Although these results are useful for comparative purposes, their relevance is limited for two reasons. First, they only cover listed firms. Second, they are not limited to the manufacturing sector.

Thanks to the database constructed by the World Bank through a major cross sectional survey conducted in 48 countries on 3000 firms, among which 80% are small and medium (Beck *et al.* 2008), we are able to perform more appropriate comparisons. On average external finance accounts for 41% over the entire sample with minor differences between developed and developing countries. Furthermore, compared to firms in emerging countries such as Turkey, Egypt, Mexico, Jordan, Poland and Argentina, Moroccan firms appear relatively undercapitalized and more reliant on external finance.

Moroccan firms, with a debt ratio amounting to 63%, seem to be located in the highest debt group with respect to the rest of the countries in the World Bank sample. However, based exclusively on their long-term debt ratio, Moroccan firms fall into the lowest debt group. This situation may be a potential source of financial fragility of Moroccan firms.

One of the basic rules in financial management is that firms need to match the maturity of their debt with the degree of liquidity of their assets. Therefore, one simple way to assess financial fragility of Moroccan firms is to test the extent to which firms comply with this matching rule. At the aggregate level as well as by size class,[g] there seems to be no mismatching issue and thus no special worry about the financial structure of Moroccan firms. Their long-term sources of finance cover their fixed assets and their current assets are larger than their current liabilities.

When we examine the items under short-term debt, we see that a large proportion is made by credit to suppliers and short-term creditors. The share of short-term bank loans is relatively limited. Trade credit is usually not free, as suppliers consider all costs including the cost of extending trade credit when setting their prices. The ICA survey indicates that in case of cash payments, firms benefit from price discounts. Theoretically, the role of credit extended by suppliers in a firm's financial structure depends on how quickly the firm can pay off new balances (Danielson and

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[g]We constructed three classes on the basis of the number of employees: small firms (less than 50), medium-sized firms (between 51 and 200) and large firms (more than 200).

Scott 2004). If a firm cannot make timely payments, probably because it faces liquidity constraints or because additional bank loans are not available, trade credit can stand as a substitute for bank loans. Otherwise, credit from suppliers can be seen as complementary to bank loans.

On the basis of the ICA survey, credit granted by suppliers represents almost one fifth of total assets and has an average duration of 74 days, with peaks around 60 and 90 days. Similarly, the share of trade receivables represents 25% of total assets with an average duration of 77 days. Different explanations are provided in the literature to motivate such behavior. In addition to limited access to finance from the banking sector (Petersen and Rajan 1995), suppliers have information superiority over banks in lending to their customers (Buckart and Ellingsen 2004) and they can monitor their financial position at lower costs (Jain 2001).

4. Econometric Analysis

Our empirical investigation is based on panel data regressions of leverage proxies on firm attributes that different theories predict to be important in explaining capital structure decisions. We first begin with a brief discussion of financial leverage proxies adopted and then examine the list of relevant explanatory variables as derived from theory.

4.1. *Financial structure proxies*

Following Rajan and Zingales (1995), the choice of leverage proxy depends on the objective of the analysis. In our case, we use four different measures of leverage based on book values of relevant financial variables.

The first is the ratio of debt to equity (Lev 1), which is typically used to assess whether a given firm is using more debt or equity to finance its business. The second is calculated as the ratio of total debt to total assets (Lev 2). These two leverage proxies have similar information content since a firm's equity is equal to its total assets minus its total debt. However, they have different ranges. The first ratio may vary between 0 (firm without debt) and infinity (firm without equity). The second ratio lies between 0 and 1. The third leverage proxy is computed as the ratio of long-term debt to permanent resources[h] (Lev 3). Finally, the fourth measure is calculated as the ratio of short-term debt to total assets (Lev 4).

By investigating various dimensions of financial structure proxies, our purpose is to deal with both debt-equity choice and debt maturity structure among non-listed manufacturing firms. By doing so, we are able to test if factors that influence short-term debt are similar or different from those that influence aggregate debt.

Figure 1 shows the distribution of the four proxies over the period 1998–2003 and Table 2 reports their descriptive statistics. The ratio of debt to equity varies between a minimum value of 0.06 and a maximum value of roughly 10 with an

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[h]Permanent resources are defined as the sum of equity and long-term debt.
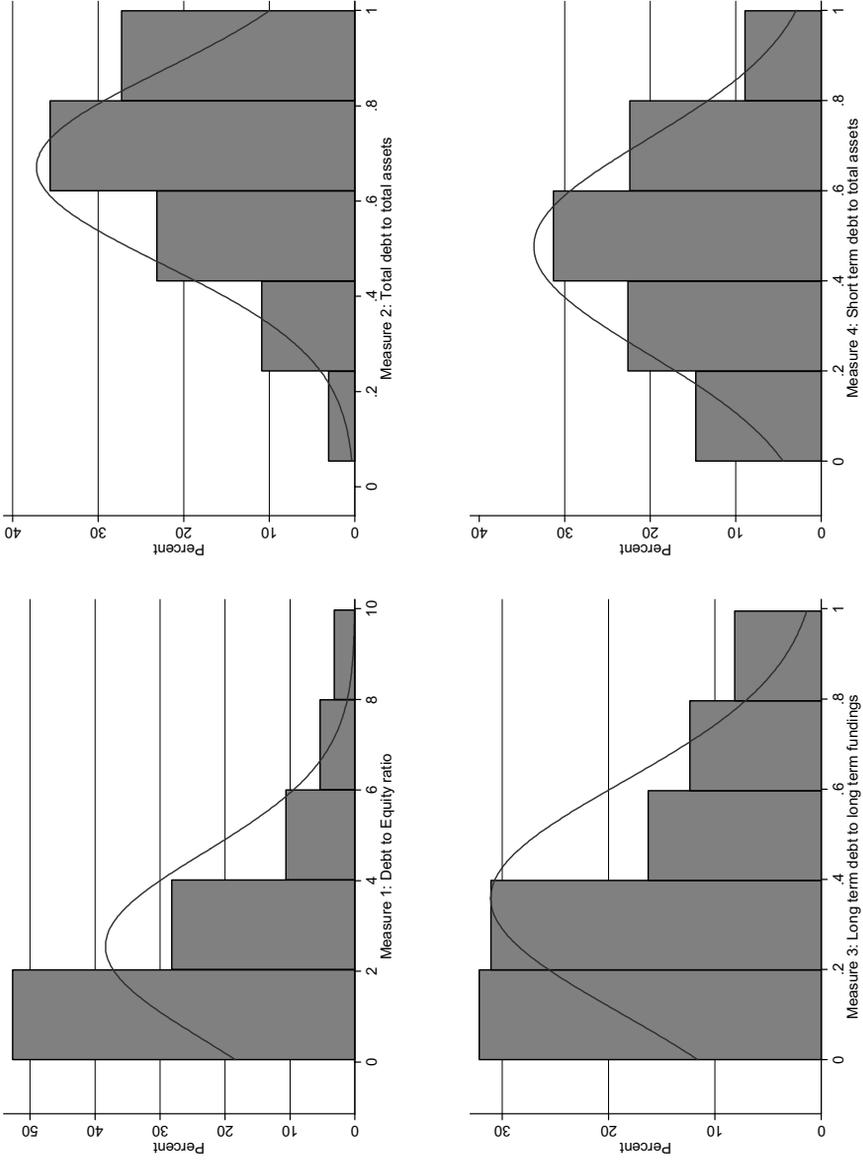
Source: Drawn by the author on the basis of the database.

Fig. 1.   Distribution of financial structure proxies.

Table 2. Descriptive statistics of leverage proxies.

	Mean	Standard deviation	Min	Max	Skewness	Kurtosis
Lev 1	2.55	2.06	0.06	9.98	1.40	4.57
Lev 2	0.67	0.20	0.05	0.94	−0.50	2.69
Lev 3	0.36	0.25	0.03	0.97	0.66	2.42
Lev 4	0.47	0.23	0.04	0.98	0.05	2.40

Source: Author's computation from the dataset. These are non-weighted statistics.

average of 2.55. The share of debt in total assets amounts to 0.67 on average and ranges between 0.05 and 0.94. The average value of the third leverage ratio (long-term debt to permanent resources) is 0.36 with values located between 0.03 and 0.97. Finally, the ratio of short-term debt to total assets is 0.47 on average and varies between 0.23 and 0.98. Financial leverage behavior among Moroccan firms seems very heterogeneous, regardless of the proxy used for its measurement. This finding is crucial as an important question in capital structure theory concerns the extent to which firms' financing decisions are driven by their own characteristics rather than being the result of the institutional environment in which they operate (Rajan and Zingales 1995).

Figure 1 shows that under a broadly similar macroeconomic and institutional environment, there is substantial amount of variation in firms' capital structure. This finding justifies the emphasis we are putting on firms' attributes as derived from theory to account for leverage behavior of the Moroccan firms.

4.2. *Potential determinants financial structure*

We follow the empirical literature and focus on the most important firm attributes derived from theory such as asset tangibility, firm size, growth prospects and profitability. The theoretical motivations behind the introduction of these attributes as well as the proxies used to capture them are presented in what follows.

4.2.1. *Asset tangibility*

The existence of asymmetric information may induce lenders to require material guarantees as collateral (Myers 1977, Harris and Raviv 1990). The type of assets a firm possesses can be considered an important factor in determining its debt-equity ratio.

Asset tangibility can also be related to the notion of a firm's financial distress, which is defined as its inability to meet interest or principal obligations to creditors and hence may be forced to declare bankruptcy or agree to restructure its financial claims. In particular, the costs of financial distress depend on the nature of assets that a firm owns (Shleifer and Vishny 1992). If a firm retains large investments in land, equipment and other tangible assets, it can sell them if it gets into financial distress. However, firms with intangible assets such as brand names, patents and

human capital will face higher financial distress costs as unhappy customers and employees can leave or seek alternative suppliers. In addition, tangible assets offer more security than current assets. Therefore, firms with assets that can be used as collateral may be expected to issue more debt.

However, large holdings of tangible assets could also suggest that a firm already owns a stable source of return which yields more internally generated funds and discourages it from relying on debt. Hence, a negative relationship between leverage and asset structure may not be ruled out.

The expected effect of asset tangibility is also expected to vary between long-term and short-term leverage behavior. In principle, the role of tangible assets is much more important for long-term debt than for short-term debt.

4.2.2. *Size*

Rajan and Zingales (1995) and Fama and Jensen (1983) argue that large firms have relatively low information asymmetry problems. From a financial distress perspective, larger firms are more diversified and therefore expected to go bankrupt less often compared to smaller ones as proposed by Warner (1977). Hence, larger firms are expected to rely more on external finance and less on their own equity and retained earnings, which implies a positive relationship between size and leverage. The same argument also implies that larger firms can more easily have access to long-term debt.

However, the "control rights model" developed by Hart (1995 and 2001) suggests that small firms, in which owners do not wish to cede control rights to outside investors, would tend to prefer debt over equity.[i] Therefore, the relationship between leverage and size may also be negative. However, if small firms cannot meet their needs through long-term loans, it is likely that most of their debt will be of short maturity.

Since there is no perfect measure for size, we suggest three different proxies that capture various aspects of the size effect. These are total sales, total employment and total assets. The purpose is to assess the robustness of our econometric results with respect to various proxies.

4.2.3. *Growth prospects*

Firms with high growth opportunities are more likely to exhaust internal funds and search for additional capital through borrowing. However, Myers (1977) argues that firms with growth potential will tend to have lower leverage. The reason is that growth opportunities can produce moral hazard effects and push firms to take more risk. This may explain why firms with important growth opportunities may be considered risky and face difficulties in raising debt on favorable terms. The

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[i]Anecdotic evidence suggests that this is the case among small and medium non-listed firms in Morocco.

relationship between leverage and growth opportunities is expected to be negative. Empirically, Rajan and Zingales (1995) and Booth *et al.* (2001) corroborate the above theoretical prediction.

As a proxy for growth prospects, we consider two alternatives. First, the change of future sales (one year ahead) using data drawn from the annual survey of manufacturing firms for which information on sales are available until 2006. Although based on actual data on future sales, this proxy is likely to introduce a selection bias since some firms with prior strong growth prospects may fail to achieve them. To partly overcome this issue, we consider using the firm's past growth in sales as an indicator for its future prospects. It turns out from our data that both proxies are highly correlated.[j] This is why we only report econometric results with the first proxy.

We investigate the impact of growth prospects on both the short and long-term leverage behavior of the Moroccan manufacturing firms.

4.2.4. *Profitability*

The pecking order theory, developed by Myers and Majluf (1984) and Myers (1984) suggests that firms prefer raising capital, first from retained earnings, second from debt, and third from issuing new equity. According to that theory, more profitable firms have more internal financing available. Therefore, we should expect a negative relationship between leverage and profitability. However, it is also likely that some firms use their profitability as an argument for additional external finance. It seems that both explanations may be uncovered by making the distinction between long-term and short-term leverage. We use the ratio of operating income to total assets as an indicator for profitability.

4.2.5. *Other potential explanatory variables*

There are other firm-specific variables that are potentially expected to be relevant in understanding the financial leverage behavior of Moroccan firms, such as the degree of concentration of ownership, the separation of ownership from control, and the share of foreign ownership. Unfortunately, data on these variables are either absent from our dataset or available only for a single year. This is why we were unable to include them in our econometric analysis.

4.3. *Econometric results*

This section presents the results of panel data regressions of various debt measures against the set of explanatory variables listed earlier. We run both random and fixed effects regressions and opt for the later on the basis of Hausman test. The estimates are reported in Table 3.

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[j]Data on sales are highly auto correlated which means that past sales is good proxy for future sales. Using the first or the second proxy does not seem to statistically change our results.

Table 3.   Regression results.

Explanatory variables	Dependant variables											
	Debt equity ratio			Debt to total assets			Long-term debt to long terms funds			Short-term debt to total assets		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Tangible assets	−0.11***	−0.10**	−0.12***	−0.05*	−0.05*	−0.05**	0.07*	0.07	0.02	−0.13***	−0.16***	−0.10***
	(−3.67)	(−2.83)	(−3.76)	(−1.86)	(−1.66)	(−2.04)	(1.75)	(1.47)	(0.48)	(−4.29)	(−4.23)	(−2.94)
Size proxy log (sales)	−0.06**			−0.02***			−0.03***			0.06		
	(−2.90)			(−3.71)			(−3.86)			(0.99)		
log (employment)		−0.06*			−0.02*			−0.09			0.02	
		(−1.85)			(−1.62)			(−0.69)			(0.22)	
log (assets)			−0.09***			−0.03**			−0.1***			0.06***
			(−3.50)			(−3.98)			(−9.60)			(7.54)
Growth potential	0.11***	0.04	0.10***	0.03**	0.08	0.03**	0.08	0.03*	0.01	0.04***	0.04***	0.04***
	(3.18)	(0.96)	(2.93)	(3.06)	(0.80)	(2.77)	(0.53)	(1.78)	(0.20)	(3.56)	(3.41)	(3.92)
Profitability proxy	−0.15	−0.33**	−0.26*	−0.19***	−0.25***	−0.23***	0.13**	0.12**	0.11**	−0.41***	−0.37***	−0.31***
	(−1.01)	(−2.08)	(−1.74)	(−4.68)	(−5.31)	(−5.36)	(2.12)	(2.50)	(2.42)	(−8.44)	(−6.63)	(−6.35)
Number of observations	2745	2278	2479	2859	2380	2863	2859	2380	2863	2859	2380	2863
R^2 (overall)	0.19	0.17	0.14	0.17	0.19	0.14	0.12	0.10	0.14	0.25	0.23	0.19
F-statistic	8.58	8.67	8.19	8.57	7.99	8.19	5.91	5.84	5.67	7.18	6.58	7.23
p-value	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Note: Author's estimation on the basis of data from FACS and ICA surveys. Four dependant variables are considered, $\left(\frac{\text{Total debt}}{\text{Equity}}\right)$, $\left(\frac{\text{Total debt}}{\text{Total assets}}\right)$, $\left(\frac{\text{Long term debt}}{\text{Long term debt}-\text{Equity}}\right)$ and finally $\left(\frac{\text{Short term debt}}{\text{Total assets}}\right)$. The estimation is based on panel data fixed effects method. The fixed effects are with respect to industries. The industries in the database are classified as follows: agro-food industry, garment industry, textiles, chemicals, electric and electronic industries, and other industries. t- Statistics are reported in parentheses. * Significance levels at 10%, ** at 5% and *** at 1%.

4.3.1. *Debt-equity issue*

The debt-equity issue is dealt with by using two complementary leverage proxies. The first is the ratio of total debt to total equity. The second is the share of total debt in total assets. As indicated earlier, these two leverage proxies have similar information content; hence their results are broadly similar. This is why we focus our comments on regressions (4), (5) and (6) reported in Table 3 under the second leverage proxy.

First, there seems to be a negative relationship between the share of tangible assets and leverage. The estimates reveal that the negative relationship is robust to the size proxy used, with statistical significance at 95% confidence level when size is measured by sales and at 90% confidence level when size is proxied either by employment or assets. These findings are inconsistent with those of Titman and Wessels (1988) as well as with those of Ozkan (2000) who found a positive relationship between the importance of tangible assets in total assets and total debt ratios. However, our results, although they may seem counterintuitive, are not completely surprising. Theoretically, as mentioned earlier, firms with large amounts of tangible assets probably already own a stable source of return that pushes them to resort to internal funds rather than debt. From an empirical perspective, Booth *et al.* (2001) have also found a negative relationship between tangibility of assets and total debt ratios of listed firms in eight out of the 10 developing countries covered in their study.[k] Therefore, the magnitude of the aggregate debt may not be necessarily constrained by a narrow collateral basis, as captured by the share of tangible assets in total assets.

Second, the relationship between size and leverage appears to be statistically significant but with a negative sign. Our estimates indicate that the direction of this relationship is not affected by the proxy selected to capture firms' size. Therefore, small manufacturing firms are relatively more indebted compared to larger firms. Our estimates are inconsistent with those found by Rajan and Zingales (1995) for OECD countries except for Germany. They are also not in line with those of Booth *et al.* (2001) except for two countries (Turkey and Zimbabwe) out of ten.

The negative relationship we found corroborates the "control rights model" developed by Hart (1995, 2001), which suggests that owners of small firms tend to increase their debt instead of strengthening their capital by opening it to outside investors. The fundamental objective of this category of owners is to keep control over their business. As a substantial share of small and medium Moroccan manufacturing firms is family owned with a high concentration of capital, the negative relationship found between size and indebtedness does not seem to be puzzling.

[k]A negative relationship has been found in eight cases: Brazil, India, South Korea, Jordan, Malaysia, Pakistan, Turkey and Thailand. The relationship was positive only in two cases: Mexico and Zimbabwe.

Growth potential is another relevant explanatory variable of financial structure of Moroccan manufacturing firms. Our estimates show that growth potential is positively associated to leverage. The relationship appears to be statistically significant in two cases out of three. Our estimates are in line with the hypothesis according to which firms with promising growth prospects tend to exhaust their internal funds and to resort more intensively to debt.

As far as profitability is concerned, its relationship with leverage turns out to be negative and statistically significant regardless of the size proxy used. The negative relationship reveals that firms generating high returns from their businesses are likely to maintain low levels of debt. This finding provides evidence supporting "the pecking order theory" suggested by Myers and Majluf (1984) that firms prefer internal funding and turn to external resources as a secondary option. It should be emphasized that Rajan and Zingales (1995), and Booth *et al.* (2001) found similar results respectively for OECD countries and listed companies in developed countries.

4.3.2. *Debt maturity issue*

An examination of Fig. 1 suggests that there are marked differences between the distributions of long-term debt ratio as compared to short-term debt ratio in the Moroccan manufacturing firms. In addition, while Moroccan firms tend to be characterized by relatively high total debt ratios, their long-term debt ratios are rather low. Both findings motivate our interest in dealing with the debt maturity issue by separating the long-term component from the short-term component of debt.

The share of long-term debt in permanent funding is used as proxy for the long-term dimension of leverage. The corresponding econometric estimates are presented in regressions (7), (8) and (9) in Table 3. Unlike our previous results, there seems to be a positive relationship between the tangibility of firms' assets and the degree of their reliance on long-term debt. This relationship is, however, not statistically significant except when total sales is used as proxy for size with a modest 90% confidence level.

It is worth mentioning that unlike short-term debt, long-term debt originates exclusively from the banking sector. Two competing explanations may lie behind the absence of a clear-cut relation between tangibility of assets and access to long-term funds. The first is demand driven. The availability of collateral is a necessary condition to have access to long-term funds. But having collateral may not automatically result in higher demand for long-term debt. The second is supply driven. The availability of collateral is a necessary but not sufficient condition to have access to long-term debt from the banking sector.

If we consider that in making their financial decisions, firms attempt to match the duration of their liabilities with the liquidity of their assets, then the demand driven explanation seems more plausible. When examining their balance sheets, manufacturing firms appear to be endowed with more long-term funds to cover their illiquid assets than what is suggested by the static matching rule. Long-term

funds (total equity and long-term debt) represent 51% of total assets compared to 33% for illiquid assets.

So how can we interpret the negative relationship found earlier when the aggregate debt ratio was used as a proxy for leverage? The negative relationship was driven by the over-representation of short-term debt in the debt portfolio of Moroccan firms. From a managerial point of view, it makes sense for a firm that carries a large share of its assets in short-term inventories and accounts receivable to accumulate a higher proportion of short-term debt. Therefore, there is a strong consistency between the results uncovered so far, and further confirmed in regressions (10), (11) and (12) on the relationship between leverage proxy and asset tangibility.

The relationship between long-term debt ratio and size lends support to the previous finding revealed when the total debt ratio is used as the leverage proxy. This relationship comes out with a negative and statistically significant sign in two cases out of three. In particular, firms with large levels of sales or assets tend to raise less long-term debt. The most plausible explanation is probably that larger firms rely much more on their retained earnings for their long-term financial needs in comparison with small and medium firms. This hypothesis seems to be confirmed when looking at the share of retained earnings in total assets for various size categories. Retained earnings represent 12% of total assets for the whole sample during the period 1998–2003, 16% for large firms and 6.5% for small and medium firms.[1] These findings provide support to the pecking order theory in shaping financial decisions of the Moroccan manufacturing firms.

The relationship between growth potential and the short-term debt ratio appears to be positive and highly significant as shown in the last three regressions of Table 3. As growth potential is measured by variation in annual sales, higher sales require, ceteris paribus, more inventories, receivables and cash. Growth potential in our case reflects short-term opportunities that are subject to cyclical shifts, it seems rational to expect that short-term debt will adjust to meet the extra liquidity needs. From this perspective, growth potential would be irrelevant in driving long-term debt ratio, which corroborates our previous findings.

Finally, profitability emerges as a factor that exerts a positive and statistically significant effect on the long-term debt ratio as reported in regressions (7), (8) and (9). In addition, this result is robust to the size proxy selected. Conversely, the impact of profitability on short-term leverage is negative. These results indicate that profitability induces the leverage behavior of firms in two directions. On one hand, it leads firms, in the short-term, to switch partly from their dependence on short-term debt, probably by retaining a portion of their internally generated cash flows. On the other hand, profitable firms seem to use their "good accounts", as suggested by Ross (1977), to signal their quality to potential borrowers and have more easy access to long run debt.

[1]For the purpose of this classification of firms, we used the Moroccan official definition for which a large firm has total annual sales over 75 million DH (approximately US$9 million).

Table 4.   The impact of firms' attributes on leverage proxies.

	Total debt to total assets	Long-term debt ratio	Short-term debt ratio
Asset tangibility	Negative and fairly robust	Not clear cut	Negative and strong
Size	Negative and fairly robust	Negative and fairly robust	Positive but weak
Growth opportunities	Positive and fairly robust	Not significant	Positive and strong
Profitability	Negative and strong	Positive and strong	Negative and strong

Note: Constructed on the basis on the econometric estimates.

To sum up, our findings from dealing with the debt equity choice and the debt maturity choice are summarized in Table 4.

5. Conclusions and Policy Implications

The objective of the paper is to provide empirical evidence on the behavior of leverage among non-listed firms in the context of the MENA region. The main findings of the paper are as follows.

Our descriptive analysis of Moroccan firms' sources of funding reveals their potential financial fragility through their excessive reliance on short-term external finance. However, one of the basic rules in financial management is that firms need to match the maturity of their debt with the degree of liquidity of their assets. At the aggregate level as well as by size class, there seems to be no special worry about the financial structure of Moroccan firms. Their long-term sources of finance cover their fixed assets and their current assets are larger than their current liabilities.

Moroccan firms are also characterized by their large proportion of credit to suppliers and short-term creditors. Understanding the determinants of this specific category of credit and its interactions with access to and cost of banking credit are very important issues that are beyond the purpose of this paper. They are left for future research.

Our empirical investigation is based on panel data regressions of leverage proxies on firm attributes such as asset tangibility, size, expected growth and profitability. For the aggregate leverage proxy, the key results can be summarized as follows.

First, a negative and statistically significant relationship emerges between the share of tangible assets and leverage. Second, the relationship between size and aggregate leverage is negative suggesting that small firms increase their debt instead of opening their capital. This explanation fits with the "control rights model" developed by Hart (1995, 2001). The challenge for policy makers is to provide an environment in which individual and family owned firms can retain sufficient profits in their businesses. Yet, the tax regime in Morocco has in 2008 removed tax rebates granted before to firms retaining their profits. The new regime stipulates that the same corporate tax is applied regardless of the firm's profit allocation. Based on our results, we believe that there is scope for fiscal policy that will provide

incentives to retain profits and encourage investment in growth oriented strategies. Third, growth potential is positively associated to leverage. This is in line with the hypothesis according to which firms with promising growth prospects tend to exhaust their internal funds and to resort more intensively to debt. Fourth, the relationship between profitability and aggregate leverage turns out to be negative and statistically significant in most cases. This finding fits with "the pecking order theory".

We then decompose leverage into its short and long-term dimensions in order to identify similarities and differences in the impact of various determinants of firms' behavior. Fairly interesting results emerge from this analysis and provide further understanding to time dimension of leverage choices in Moroccan manufacturing firms.

First, unlike our previous results, there seems to be a positive but statistically weak relationship between the tangibility of firms' assets and the degree of their reliance on long-term debt. Two competing explanations may lie behind the absence of a clear-cut relation between tangibility of assets and access to long-term funds. The first is demand driven. The second is supply driven. If we consider that in making their financial decisions, firms attempt to match the duration of their liabilities with the liquidity of their assets, then the demand driven explanation seems more plausible. It implies that availability of collateral is a necessary condition to have access to long-term funds. But having collateral may not automatically result in higher demand for long-term-debt. Moreover, manufacturing firms appear to be endowed with relatively more long-term funds than with what they really need for covering their illiquid assets. The relationship between asset tangibility and short-term leverage maintains a negative sign. From a managerial point of view, it makes sense for a firm that carries a large share of its assets in short-term inventories and accounts receivable to accumulate a higher proportion of short-term debt. Therefore, there is a strong consistency between the results uncovered for different measures of leverage and asset tangibility.

Second, the relationship between long-term debt ratio and size lends support to the previous finding uncovered when the total debt ratio is used as the leverage proxy. In particular, firms with large levels of sales or assets tend to raise less long-term debt. The most plausible explanation is probably that larger firms rely much more on their retained earnings for their long-term financial needs in comparison to small and medium firms. This hypothesis seems to be confirmed when looking at the share of retained earnings in total assets for various size categories. These findings provide support to the pecking order theory in shaping financial decisions of Moroccan manufacturing firms.

Third, the relationship between growth potential and short-term debt ratio appears to be positive and highly significant. As growth potential is measured by variation in annual sales, higher sales require, ceteris paribus, more inventories, receivables and cash. Since growth potential in our case reflects short-term opportunities that are subject to cyclical shifts, it seems rational to expect that short-term

debt will adjust to meet the extra liquidity needs. From this perspective, growth potential would be irrelevant in driving long-term debt ratio.

Fourth, profitability emerges as a factor that exerts a positive and statistically significant effect on the long-term debt ratio. In addition, this result is robust to the size proxy selected. Conversely, the impact of profitability on short-term leverage is negative. These results indicate that profitability induces the leverage behavior of firms in two opposite directions. On one hand, it leads firms, in the short-term, to switch partly from their dependence on short-term debt, probably, by retaining a portion of their internally generated cash flows. On the other hand, profitable firms seem to use their "good accounts", as suggested by Ross (1977), to signal their quality to potential borrowers and have more easy access to long run debt.

Finally, while the existence of supply-side financial constraints tends to be the main anecdotal evidence usually referred to in explaining financial structure of Moroccan firms, the evidence emerging from our paper indicates that a substantial amount of the explanation is demand driven. Hence, the barriers to firms' growth frequently perceived as financial, are often managerial and cultural. The availability of external funds alone may not be sufficient to solve the problem.

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