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UNDERSTANDING FINANCIAL STRUCTURE
OF NON-LISTED FIRMS IN MENA PANEL DATA
APPROACH APPLIED TO MOROCCAN FIRMS

Lahcen Achy and Jawad El Otmani

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APPLIED TO MOROCCAN FIRMS**

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Abstract

The purpose of this paper is to empirically investigate the determinants of financial structure in non-listed Moroccan manufacturing firms using a panel data approach. 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 normally focus on developed countries. Yet, there are reasons to expect that capital structure decisions of non-listed firms are constrained either by their own characteristics or by their limited access to financial and credit markets. This is particularly the case in developing countries where most firms are reluctant to open their equity to outside investors, and lack rigorous accounting standards that create higher information asymmetry for potential borrowers. In addition, since capital markets are less developed, the range of financial instruments available to non-listed firms is relatively narrow. Thanks to a panel dataset covering some 550 firms over the period 1998-2003, we are able to extend the existing empirical work on capital structure to non-listed manufacturing firms in the specific context of a developing MENA country, namely Morocco. The findings of this paper are crucial to further understand the determinants of financial structure, and to provide useful insights to academics and guidance to policy makers. The key finding of the paper is: While, the existence of supply-side financial constraints is the main anecdotic evidence usually referred to in explaining the financial structure of the Moroccan firms, the evidence emerging from our paper indicates that demand-driven constraints can largely explain the financial structure. Hence, barriers to firms' growth — frequently perceived as financial — are often managerial and cultural and therefore the availability of external funds may not always be sufficient to promote growth.

ملخص

تهدف هذه الورقة إلى إجراء دراسة قائمة على التجربة على محددات الهيكل المالي للمؤسسات التصنيعية المغربية الغير مدرجة في البورصة وذلك باستخدام منهج لوحة البيانات. وثمة رصيد كبير من المؤلفات التي تربط بين هيكل رأس المال في الشركات بالسمات الخاصة بالشركات والصناعة ربطاً قائماً على النظرية، إلا أن أغلب الدراسات تستخدم بيانات خاصة بالشركات المسجلة بالبورصة وتركز في كثير جداً من الأحيان على الدول المتقدمة. ولكن هناك من الأسباب ما يجعلنا نتوقع أن قرارات هيكل رأس المال في الشركات الغير مدرجة بالبورصة إما يحكمها السمات الخاصة بتلك الشركات أو بقدرتها المحدودة على الوصول إلى الأسواق المالية والإئتمانية. وهذا هو الحال بشكل خاص في البلدان النامية حيث تحجم معظم الشركات بها عن فتح رأس مالها وأسهمها لمستثمرين من الخارج إضافة إلى عدم توافر معايير محاسبية صارمة؛ الأمر الذي من شأنه أن يؤدي إلى زيادة تباين المعلومات للمقترضين المحتملين. وبالإضافة إلى ذلك فإنه نظراً لأن أسواق المال هي أقل تطوراً، فإن نطاق الأدوات المالية المتاحة للشركات الغير مدرجة بالبورصة يكون ضيقاً نسبياً. واستناداً إلى حزمة من البيانات عن حوالي 550 شركة خلال الفترة من العام 1998 حتى العام 2003، يمكننا أن نوسع نطاق العمل الخبروي القائم متناولاً هيكل رأس المال لشركات التصنيع الغير مسجلة بالبورصة في سياق محدد لبلد نامٍ ينتمي لمجموعة دول الشرق الأوسط وشمال إفريقيا ألا وهو المغرب. أما النتائج التي خلصت إليها هذه الورقة فهي ذات أهمية كبيرة من أجل مزيد من الفهم لمحددات الهيكل المالي كما أنها توفر معلومات مفيدة جداً للأكاديميين وإرشادات لصانعي السياسات. ويمكن بيان أهم النتائج التي انتهت إليها هذه الورقة على النحو التالي: ففي الوقت الذي يشار فيه عادةً إلى محددات مالية تتعلق بالعرض على أنها المؤشر الوحيد المتاح لشرح طبيعة الهيكل المالي للشركات المغربية، فإن النتائج المستمدة من هذه الورقة تشير إلى أن ثمة محددات أخرى تتعلق بالطلب لا بد من أخذها في الاعتبار عند شرح طبيعة الهيكل المالي لتلك الشركات. وبناءً عليه فإن العوائق التي تحول دون تطور الشركات والتي كثيراً ما ينظر إليها على أنها عوائق مالية تكون في أغلب الأحيان عوائق ذات طابع إداري وثقافي ومن ثم فإن توافر أموال خارجية قد لا يساعد دائماً على التغلب على تلك العوائق.

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 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 so there is an important knowledge gap that needs to be addressed.

From a policy making point of view, most Moroccan manufacturing firms perceive access and cost of finance as their major constraints (ICA surveys 2000 and 2004). In addition, various studies on the failure of small and medium firms in developing countries have identified financial leverage as the primary cause of failure (Keasey and Watson (1987) and Ang (1992)).

In addition, 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)).

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.

We use four different measures of leverage. By investigating both long and short-term indicators of leverage, our purpose is to deal with both debt-equity choice and debt maturity issues 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 long-term debt.

The rest of the paper proceeds as follows. Section 2 summarizes the main findings of previous empirical work on leverage determinants, particularly in developing countries. 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 applied, and discusses the main empirical results. It also compares and contrasts these results with their counterparts in the literature. Finally, Section 5 sums up the main findings and draws their policy implications.

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. The trade-off model suggests that firms target an optimal level of leverage to balance tax benefits of extra debt against expected costs of financial distress (Myers (2001)). The agency cost model initiated by Jensen and Meckling (1976) postulates that managers have other objectives, which may lead them to waste the firm's free cash flow. The advantage of debt is to reduce free cash flow available to managers. The "pecking order model" developed by

Myers and Majluf (1984) argues that firms use their retained earnings first, then opt for debt, and use equity finance as a last resort.

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 and Rajan and Zingales (1995) 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, 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)¹. Their findings indicated that, overall, capital structure choices in developing countries are affected by the same variables as in developed countries. Finally Agrawal 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.

Achy and Rigar (2005) made a first attempt to explore the determinants of financial structure among non-listed firms in Morocco. However, their paper was based on a cross section of firms, which was not sufficient to account for heterogeneity among firms. The objective of our paper is to further investigate the issue on the basis of a panel made from 550 non-listed firms over a period of six years.

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. To obtain this sample merge two separate but consistent databases. 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 were jointly conducted by the Moroccan Ministry of Industry and the World Bank. We also had to use the annual survey to complement our data.

To our knowledge, this is the most comprehensive dataset on financial variables that has ever been constructed on the manufacturing sector in Morocco. It is worth mentioning that before we started our analysis, we had to check the data for consistency and detect potential outliers on the basis of accounting rules and logical relationships. Overall, and from a pure statistical point view, our dataset seems to be of good quality.

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.

¹ Countries covered by Booth et al. (2001) included: Brazil, Mexico, India, South Korea, Jordan, Malaysia, Pakistan, Thailand, Turkey and Zimbabwe.

The share of equity, which represents the amount of money initially invested by owners plus any retained earnings, represents 37 percent over the period under study. It increases from around 32 percent in 1998 to more than 40 percent in 2004 due mainly to the drastic jump recorded in retained earnings. The share of the later in total liabilities goes up from 4.9 percent in 1998 to 16.7 percent in 2003.

Despite this change, debt continues to play a central role in the capital structure of the Moroccan manufacturing sector. This is particularly the case of short-term debt (current liabilities), which accounts for roughly the equivalent of half total 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 percent. Overall, these findings seem to confirm that Moroccan manufacturing firms tend to be undercapitalized and highly indebted.

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). Their results are very useful for comparative purposes. For developed countries, debt ratios ranged between 54 percent (UK) and 73 percent (Germany). For developing countries, debt ratios were globally lower and ranged between 30 percent in Brazil and a surprising 73 percent 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 percent in the UK and 53 percent in Japan. Conversely, in developing countries short-term debt exceeded long-term with the exception of South Korea and India.

Morocco, with a debt ratio amounting to 63 percent, seems to be located in the highest debt group with respect to developing countries. However, based exclusively on its long-term debt ratio, Morocco falls into the lowest debt group. This finding reveals the potentially worrying financial fragility of Moroccan firms and their excessive reliance on short-term external finance compared to firms in other countries of similar development level. The striking difference between the roles played by short-term debt compared to long-term financing motivates why we focus, later in our analysis, not only on debt-equity choice, but also on debt-maturity issues.

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. This is another interesting finding that motivates our interest in investigating financial structure of non-listed firms. In contrast to listed firms, their financing options are generally limited, as they do not have access to bond and equity markets. In addition to short term loans from banks, they also depend heavily on credit from suppliers. This type of 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.

The role of credit extended by suppliers in a firm's financial structure depends on how quickly the firm can pay off new balances. If it makes timely payments, credit from suppliers can be seen as complementary to bank loans. However, 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. On the basis of the ICA survey, average duration of credit granted by suppliers is 74 days, with peaks around 60 and 90 days. This result clearly confirms that manufacturing firms in Morocco use trade credit as a substitute to bank loans.

4. Econometric Analysis

Our empirical investigation is based on panel data regressions of leverage proxies on firm's 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 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). The second is calculated as the ratio of debt to total assets (Lev 2). The third is computed as the ratio of long-term debt to permanent resources² (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 simultaneously with both debt-equity choice and debt maturity issues 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 the aggregate debt. Figure 1 shows the distribution of the four proxies over the period 1998-2003 and Table 2 reports their descriptive statistics.

We clearly see that financial leverage behavior among Moroccan firms is very heterogeneous, with marked differences between short-term and long-term components of debt. This finding is crucial as an important question in capital structure theory relates to 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 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's 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.

Asset Tangibility

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

Asset tangibility can also be related to the notion of financial distress costs. In particular, the costs of financial distress depend on the nature of assets that a firm owns. If a firm retains large investments in land, equipment and other tangible assets, it will have smaller costs of financial distress than a firm that relies on intangible assets. In addition, fixed generally 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 also

² Permanent resources are defined as the sum of equity and long term debt.

be expected. Since we define four different measures of leverage, the expected effect of asset tangibility may vary between long-term and short-term debt ratios. One of the basic rules in financial management is that firms match the maturity of their debt with the degree of liquidity of their assets. In our empirical investigation we use the share of fixed assets in total assets as a proxy for the collateral value of assets.

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 less often expected to go bankrupt compared to smaller ones as proposed by Warner (1977). Hence, small firms are expected to rely less on external finance and more on their own equity and retained earnings.

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. Anecdotic evidence suggests that this is the case among most non-listed firms in Morocco. Hence, the relationship between leverage and size may also be negative.

It has also been shown that delaying payments to creditors is very frequent among small firms. Therefore, small firms can be expected to increase their short-term bank borrowing when suffering from late payments. This is why we use both long-term debt ratio and short-term debt ratio in our investigation. 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.

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. We used the percentage change of future sales as proxy for growth opportunities. To this end our data was drawn from the annual survey for which data on sales was available until 2006.

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. We use the ratio of operating income to total assets as an indicator for profitability.

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 but 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 the Tables 3, 4, 5 and 6.

a. Debt-Equity Issue

The debt-equity issue is dealt with by using two complementary leverage proxies. The first is simply the ratio of total equity to total debt. The results are reported in Table 3. The second is the share of total debt in total assets. The results are shown in Table 4. The results are broadly similar in both cases. This is why we prefer to comment on both simultaneously.

First, there seems to be a negative and statistically significant relationship between the share of tangible assets and both leverage proxies. Our econometric estimates reveal that the negative relationship is robust to the size proxy used. 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, they 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. On the empirical ground, 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 study³. 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 large share of the 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.

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 as reported in Tables 3 and 4. Theoretically, 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 in all cases but one. The negative relationship reveals that firms generating high returns from their businesses are likely to maintain low levels of debt. This

³ 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.

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.

b. Debt Maturity Issue

An examination of Figure 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 high total debt ratios, their long-term debt ratios are rather low. Both findings motivate our interest in dealing with 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 results are presented in Table 5.

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, statistically significant when total sales is used as proxy for size. Yet, this finding is very useful from an economic point of view in understanding the leverage behavior of Moroccan manufacturing firms. Since collateral is required for long-term funds, firms with weak collateral basis tend to have less access to this category of funds.

So how can we interpret the negative relationship found earlier when 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. Conversely, long-term dominates debt portfolio in OECD countries, which explains the positive sign between their aggregate debt ratio and asset tangibility.

The same reasoning applies to the relationship between long-term debt ratio and size. This relationship comes out with a positive and statistically significant sign in two cases out of three. Therefore, there is evidence that size tends to positively affect the capacity of Moroccan firms to raise long-term debt.

Regarding growth potential, our econometric estimates indicate that it is positively related to long-term debt ratio. However, the coefficient associated with growth potential fails to be statistically significant in two cases out of three.

Paradoxically, profitability emerges as a variable that exerts a positive and statistically significant effect on long-term debt ratio. In addition, this result is robust to the size proxy selected. This finding, which differs from what we uncovered with the aggregate leverage proxies, implies that more profitable firms are likely to rely strongly on long-term debt. The rationale behind is probably that profitable firms 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.

With regards to short-term leverage behavior, our econometric estimates are presented in Table 6. For three explanatory variables out of four, the results are broadly consistent with those found when we investigated the debt equity issue and used aggregate leverage proxies.

More precisely, short-term debt ratio tends to increase among firms with low levels of tangible assets, and those that generate poor returns. On the other hand, promising growth prospects exert a positive impact on the propensity of firms to rely on short-term debts.

However, size does not emerge as a significant factor in shaping short-term leverage behavior of Moroccan manufacturing firms, regardless of the proxy used to measure firms' size.

To sum up, our findings from dealing with the debt equity choice and the debt maturity choice are summarized in the Table 7.

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 findings of the paper are expected to help policy makers understand the role of access to finance in constraining firms' growth. Ultimately, this understanding is crucial for designing appropriate policies geared toward banks or specific categories of firms. The main findings of the paper are as follows.

Our descriptive analysis of Moroccan firms' sources of funding reveals their potentially worrying financial fragility through their excessive reliance on short-term external finance. Morocco, with a debt ratio amounting to 63 percent, seems to be located in the highest debt group among developing countries. However, based exclusively on its long-term debt ratio, Morocco falls into the lowest debt group. The striking difference between the roles played by short-term debt compared to long-term financing motivates why we focus, later in our econometric analysis, not only on debt-equity choice, but also on debt-maturity issue.

Another interesting characteristic of Moroccan firms is that a large proportion of their short-term debt is made by credit to suppliers and short-term creditors. The share of short-term bank loans is relatively limited. In contrast to listed firms, funding options of non-listed firms are generally limited, as they do not have access to bond and equity markets. Credit from suppliers 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. The same survey also reveals that the average duration of credits granted by suppliers is 74 days, with peaks around 60 and 90 days. 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. However, since data needed to address them is available in our database, we postpone them for future research.

Our empirical investigation is based on panel data regressions of leverage proxies on firm's attributes such as asset tangibility, size, expected growth and profitability. Other variables such as the degree of concentration of ownership, the separation of ownership from control, and the share of foreign ownership are expected to be potentially relevant in understanding financial leverage behavior of the Moroccan firms. However, due to data constraints, we were not able to include them into our model. We use four different measures of leverage in order to deal with both debt-equity choice and debt maturity issue among non-listed manufacturing firms. The first and the second measures are both used as proxies for aggregate leverage behavior. The third and the fourth proxies account respectively, for short-term and long-term leverage behavior.

The econometric estimates reveal broadly similar results for the aggregate leverage measures. First, a negative and statistically significant relationship emerges between the share of tangible assets and leverage. Booth et al. (2001) have found the same results for listed firms in eight out of 10 developing countries. Therefore, aggregate leverage 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 aggregate leverage is statistically significant but with a negative sign, which is inconsistent with what has been found by Rajan and Zingales (1995) for OECD countries except for Germany and by Booth et al. (2001) except for Turkey and Zimbabwe out of ten countries. One plausible explanation for our finding is

that owners of small firms tend to increase their debt instead of strengthening their capital by opening it to outside investors. This explanation fits with the “control rights model” developed by Hart (1995, 2001) and appears to be very likely as a large share of the Moroccan manufacturing firms is family owned with a high concentration of capital. 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”. It is also consistent with Rajan and Zingales (1995), and Booth et al. (2001) respectively for OECD countries and listed companies in developed countries.

Our paper also investigates the maturity dimension of leverage in order to identify similarities and differences between short-term and long-term determinants of firms’ behavior.

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 means that collateral is required for long term funds and that firms with weak collateral basis tend to have less access to this category of funds. The negative relationship found with the aggregate leverage was driven by the over-representation of short-term debt in the debt portfolio of Moroccan firms. The same reasoning applies to the relationship between long- term debt ratio and size that comes out with a positive sign. Profitability emerges as a variable that exerts a positive and statistically significant effect on long-term debt ratio. This finding, which differs from what we uncovered with the aggregate leverage proxies, implies that more profitable firms are likely to rely strongly on long-term debt. The rationale behind is probably that profitable firms use their “good accounts” to signal their quality to potential borrowers and have more easy access to long-run debt.

For short-term debt ratio, the results are broadly consistent with those found when we investigate the debt-equity issue and used aggregate leverage proxies. More precisely, short-term debt ratio tends to increase among firms with low levels of tangible assets, and those that generate poor returns. On the other hand, promising growth prospects exert a positive impact on the propensity of firms to rely on short-term debts. However, size does not emerge as a significant factor in shaping the short-term leverage behavior of Moroccan manufacturing firms.

What Policy Implications Can Be Drawn from our Paper?

First, one important results of our paper is that owners of small firms tend to increase their debt instead of strengthening their capital by opening it to outside investors. This explanation fits with the “control rights model” developed by Hart. The challenge for policy makers is to provide an environment in which individual and family owned firms can retain sufficient profits in their businesses to fund the largest possible number of economically viable projects (Reid, 1996). Yet, the tax regime in Morocco has in 2008 removed tax rebates offered 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 do believe that there is scope for fiscal policy that will provide incentives to retain profits and encourage investment in growth oriented strategies. We learned from our descriptive analysis that the share of equity in Moroccan manufacturing firms increased from around 32 percent in 1998 to more than 40 percent in 2004 due mainly to the drastic jump recorded in the retained earnings. Hence, it is likely that the new tax regime will exert perverse effects on the share of profit retained by firms in the coming years.

Second, another relevant lesson drawn from this paper emerges from the distinction between demand-driven and supply-driven financial constraints. A supply-driven constraint can be defined as a capital market imperfection that leads to rationing. A demand-driven constraint is defined as a situation in which firm's financial structure is adversely affected by a factor internal to the firm. This is the case if the firm's owners would like to grow, but the only way to achieve this objective is by handing over part of equity, and yet they refuse to do so. While the existence of a supply-side financial constraint tends to be the main anecdotic evidence usually referred to in explaining financial structure of the Moroccan firms, the evidence emerging from our paper indicates that a substantial amount of the explanation lies behind demand-driven constraints. 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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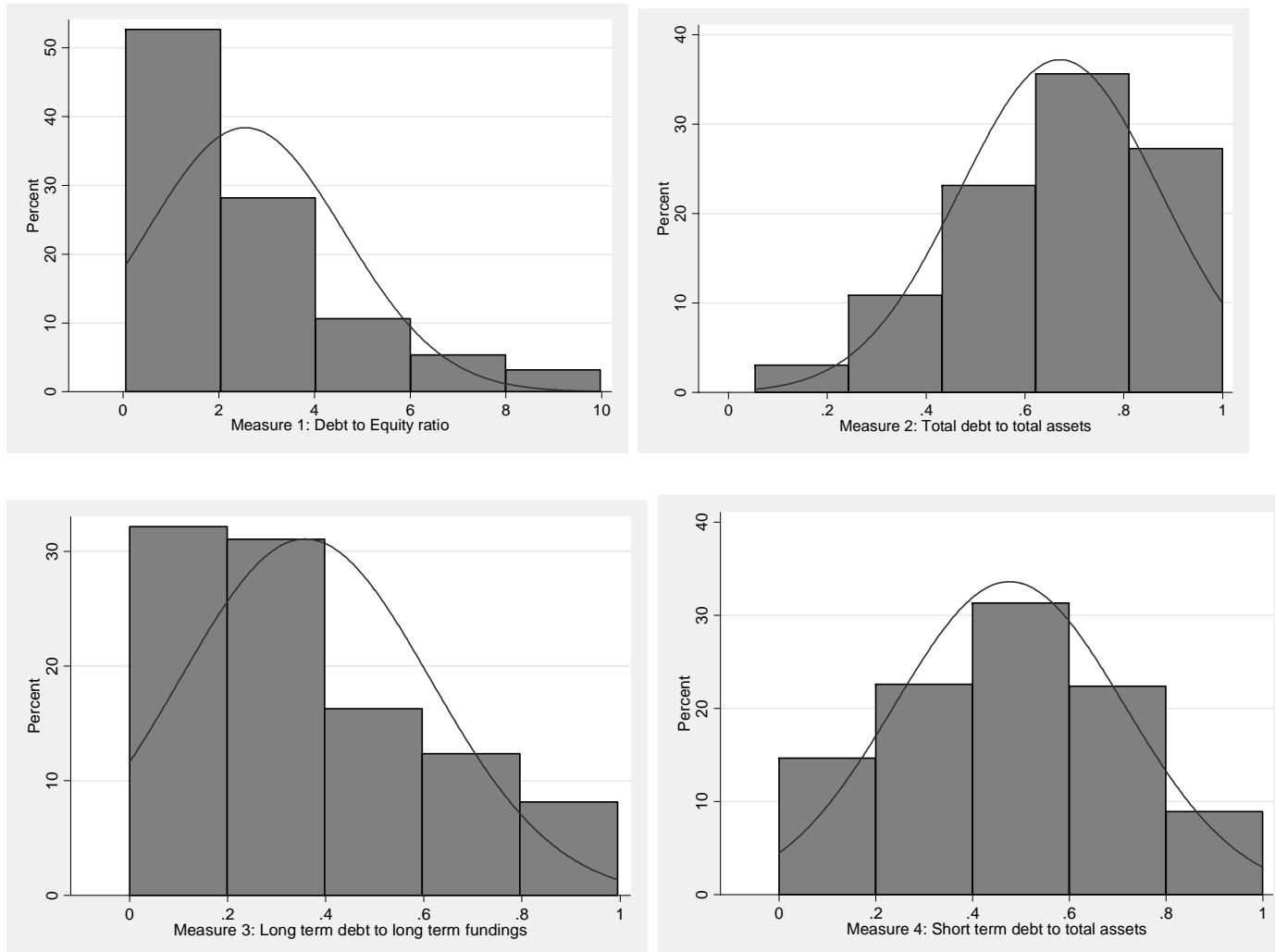
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Figure 1: Distribution of Financial Structure Proxies



Source: Drawn by the authors' on the basis of the database

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	100	100	100

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

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: Authors' computation from the dataset. These are non-weighted statistics.

Table 3: Dependant Variable - Debt Equity Ratio

Explanatory Variables	(1)	(2)	(3)
Tangible assets	-0.11*** (3.67)	-0.10** (-2.83)	-0.12*** (-3.76)
Size proxy			
log (sales)	-0.06** (2.90)		
log (employment)		-0.06* (-1.85)	
log (assets)			-0.09*** (-3.50)
Growth potential	0.11*** (3.18)	0.04 (0.96)	0.10*** (2.93)
Profitability proxy	-0.15 (-1.01)	-0.33** (-2.08)	-0.26* (-1.74)
Number of observations	2745	2278	2479
R ² (overall)	0.19	0.17	0.14
F-statistic	8.58	8.67	8.19
p-value	0.00	0.00	0.00

Note: Authors' estimation on the basis of data from FACS and ICA surveys. The estimation is based on panel data fixed effects method. t- Statistics are reported in parentheses. * Significance levels at 10 percent, ** at 5% and *** at 1%.

Table 4: Dependant Variable - Debt to Total Assets

Explanatory Variables	(1)	(2)	(3)
Tangible assets	-0.05* (-1.86)	-0.05* (-1.66)	-0.05** (-2.04)
Size proxy			
log (sales)	-0.02*** (-3.17)		
log (employment)		-0.02* (-1.62)	
log (assets)			-0.03** (-3.98)
Growth potential	0.03** (3.06)	0.08 (0.80)	0.03** (2.77)
Profitability proxy	-0.19*** (-4.68)	-0.25*** (-5.31)	-0.23*** (-5.36)
Number of observations	2859	2380	2863
R ² (overall)	0.17	0.19	0.14
F-statistic	8.57	7.99	8.19
p-value	0.00	0.00	0.00

Note: Authors' estimation on the basis of data from FACS and ICA surveys. The estimation is based on panel data fixed effects method. t- Statistics are reported in parentheses. * Significance levels at 10 percent, ** at 5% and *** at 1%.

Table 5: Dependant Variable – Long-term Debt to Long-term Funds

Explanatory Variables	(1)	(2)	(3)
Tangible assets	0.07* (1.75)	0.07 (1.47)	0.02 (0.48)
Size proxy			
log (sales)	0.03*** (3.86)		
log (employment)		0.09 (0.69)	
log (assets)			0.1*** (9.60)
Growth potential	0.08 (0.53)	0.03* (1.78)	0.01 (0.20)
Profitability proxy	0.13** (2.12)	0.12** (2.50)	0.11** (2.42)
Number of observations	2859	2380	2863
R ² (overall)	0.12	0.10	0.14
F-statistic	5.91	5.84	5.67
p-value	0.00	0.00	0.00

Note: Authors' estimation on the basis of data from FACS and ICA surveys. The estimation is based on panel data fixed effects method. t- Statistics are reported in parentheses. * Significance levels at 10 percent, ** at 5% and *** at 1%.

Table 6: Dependant Variable – Short-term Debt to Total Assets

Explanatory Variables	(1)	(2)	(3)
Tangible assets	-0.13*** (-4.29)	-0.16*** (-4.23)	-0.10*** (-2.94)
Size proxy			
log (sales)	0.06 (0.59)		
log (employment)		0.02 (0.22)	
log (assets)			0.06 (0.54)
Growth potential	0.04*** (3.56)	0.04*** (3.41)	0.04*** (3.92)
Profitability proxy	-0.41*** (-8.44)	-0.37*** (-6.63)	-0.31*** (6.35)
Number of observations	2859	2380	2863
R ² (overall)	0.25	0.23	0.19
F-statistic	7.18	6.58	7.23
p-value	0.00	0.00	0.00

Note: Authors' estimation on the basis of data from FACS and ICA surveys. The estimation is based on panel data fixed effects method. t- Statistics are reported in parentheses. * Significance levels at 10 percent, ** at 5% and *** at 1%.

Table 7: The Impact of Various Firms' Attributes on Leverage Proxies

	Debt Equity ratio	Total debt to total assets	Long-term debt ratio	Short-term debt ratio
Asset tangibility	-	-	+	-
Size	-	-	+	?
Growth opportunities	+	+	+	+
Profitability	-	-	+	-

Note: “?” indicates that the corresponding estimated coefficient is not statistically significant.