Export Intensity and Financial Policies of Indian firms

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Abstract

If product demand from abroad has a low correlation with domestic demand, we would expect export-intensive firms to have greater cashflow stability than firms that only sell domestically. This implies that they would also be able to support higher financial leverage. We test this hypothesis by looking at a sample of Indian firms. The hypothesis is tentatively accepted.

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I. Introduction

After obtaining independence from their erstwhile masters, many colonies found themselves in a difficult situation. Many of them had manufacturing sectors that suffered from underinvestment and underdevelopment. At the same time, they had to cope with burgeoning populations and the high expectations of a newly-liberated people. The question was how they could grow in short order. The solution that many economists recommended was exports. Considering their poverty in terms of capital, autarky would hardly make sense. What better way, then, to obtain resources than to focus on exports to developed and other developing countries?

In the half century or so that developing countries have been trying out this policy, a lot of data has accumulated. Economists have investigated the relative success of this policy in many countries across the globe. Most of this research is at a macro-level, i.e. it looks at the effects of export-led growth on the welfare of the country as a whole. However, some researchers have also looked at this question at a micro-level. Thus, Chibber and Majumdar (1998) look at whether Indian firms that export tend to be more profitable than other firms. They find a positive relationship between exporting and profitability, and they use this as support for the proposition that "for firms from developing and transition economies like India it does pay to venture abroad, and the ability to sell goods overseas has a significant impact on firms' economic performance."[1]

In addition to research reviewing the results of such policies, there has been another strand of research that has looked at determinants of the success of firms in

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[1] Chhibber and Majumdar (1998, p. 121)

exporting. The globalization of the world economy has increased the importance of this strand of research. However, most of this research has focused on operational factors. Thus, Aulakh, Kotabe and Teegen (2000) look at exporting firms in Brazil, Chile and Mexico and find, inter alia, that "cost-based strategies enhance export performance in developed country markets and differentiation strategies enhance performance in other developing countries." A related strand of the literature looks at what differentiates export-oriented firms from other firms. The emphasis here is not so much on what makes firms more successful at exporting, from a normative point of view, i.e. in identifying strategies that all firms might utilize in improving their export performance, but rather in considering what makes some firms enter export markets, while others don't. A recent example of this is Demirbas, Patnaik and Shah (2009), who find that more productive firms gravitate to export markets. While the results could plausibly be interpreted in a normative sense,[2] the emphasis is on a positivistic interpretation; i.e., what are the firm characteristics that lead firms to export?

In spite of the volume of research at the firm-level on exporting and export behavior, very little has been done regarding the financial policies of exporting firms.[3] In this paper, we look at one aspect of their financial policies, specifically their financial leverage. This research is interesting and useful from many points of view – one, it can be used normatively to look at how firms can use financial policies to improve their

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[2] To the extent that firms that are not successful in exports would tend to go bankrupt or otherwise drift out of the exporting industry, any sample of firms would tend to have firms successful in exporting. From this point of view, the results of such studies could be used normatively.

[3] Demirbas, Patnaik and Shah (2009) document the financial leverage of different kinds of exporting and non-exporting firms. However, this is not their primary interest.

export performance; and two, it can be used to test theories of exporting firms.[4] Finally, it can be used to throw light on theories of capital structure.

It is quite well known that firms' capital structures depend upon their industry affiliation, the nature of the assets they hold, etc. Why would there be any connection between firms' export intensities and their capital structure? One answer points to the low correlation between demand from abroad and domestic demand, particularly for developing countries.[5] If this is the case, then firms that have diversified their operations to export markets, in addition to domestic sales, would have greater stability of cashflows. This should lead to an ability to take on greater financial leverage. In other words, even after adjusting for industry differences, we would expect to find that exporting firms take on more leverage than other firms. We should also be able to relate this additional leverage to the lower volatility of cashflows, as well as to the choice of export markets – firms exporting to markets that are more detached from their own home economies would take on more leverage.

However, export status might very well be correlated negatively with financial leverage, as well. There is a lot of evidence (see e.g. Ganesh-Kumar, Sen and Vaidya, 2003) that exporting firms are better and more efficient than other firms. If so, these firms probably have a lot of human capital incorporated in their value. Human capital, like other intangible assets, does not support high debt. According to this theory, exporting firms would have lower financial leverage.

Another reason for looking at exporting firms' financial policies is their ability to throw light on theories suggesting a connection between financial market development

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[4] See, for example, Cavusgil (1982) Czinkota (1982), Moon and Lee (1990), Rao and Naidu (1992), Wortzel and Wortzel (1981) and Bernard and Jensen (2004).

[5] See, for example, Fadhlaoui, Bellalah, Dherry and Zouaouil (2008).

and economic development.[6] If this is true, then the success of exporting firms, which are often the force moteur of development, might have something to do with their superior access to finance. On the other hand, if exporting firms' financial policies are determined by their characteristics, rather than determining their ability to export, there would be less support for the financial markets-development nexus espoused by these theories. We discuss our results in the next section.

II. Data and Methodology

A: Data

Data was obtained from the Prowess database marketed by CMIE (Centre for the Monitoring of the Indian Economy). While CMIE data is available from the 1990s, there are a lot of policy changes in the earlier years; furthermore, firms are still responding to the new economic environment in these years.[7] Hence we used data from a more recent time period. We chose firms on the A and B lists of the Bombay Stock Exchange with available data from the years 2000 to 2007. With this sample of firms, we regressed the log of the debt-asset ratio on the log of the ratio of exports to sales, as well as on several explanatory variables.[8] We ran the regression as an unbalanced panel regression with a total sample size of 11291 observations from 1882 firms. The R-squared of the regression was 17.54%.

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[6] See, for example, Levine and Zervos (1998) and Rajan and Zingales (1998).

[7] There is some evidence even in the earlier years that exporting firms are already different from other firms (see Ganesh-Kumar, Sen and Vaidya, 2003).

[8] Since there were many firms that did not export at all and other firms that had no debt, we added a small positive number to the ratio of exports to sales and to the debt/equity ratio before taking the natural logarithms of the two variables.

Table 1: Financial Leverage as a function of firm characteristics and exports excluding direct Measures of Cashflow Volatility

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Constant	-4.672289	0.116568	-40.08201	0.0000
Log(Exports/Sales)	**0.016288**	0.004744	3.433564	0.0006
Log(Assets)	**0.266215**	0.014237	18.69926	0.0000
Capital_Intensity	**4.325869**	0.115189	37.55465	0.0000
Profit Margin	0.000109	8.60E-05	1.264447	0.2061
Intangibles-to-Assets Ratio	**-4.887522**	0.503531	-9.706494	0.0000
Market-to-Book Ratio	**-0.091713**	0.007678	-11.94453	0.0000
Beta	**0.076987**	0.015941	4.829537	0.0000
Cashflow/Assets	-0.096805	0.053095	-1.823249	0.0683
Y2001	**-0.288475**	0.104351	-2.764460	0.0057
Y2002	**-0.432928**	0.104335	-4.149415	0.0000
Y2003	**-0.460739**	0.103770	-4.439992	0.0000
Y2004	**-0.372348**	0.103096	-3.611670	0.0003
Y2005	**-0.337658**	0.102032	-3.309321	0.0009
Y2006	**-0.399666**	0.100877	-3.961909	0.0001

B. The effects of the other explanatory variables:

We chose several explanatory variables based on capital structure theory. There is a fair amount of literature suggesting that larger firms tend to have greater financial leverage. The whole notion of size as a determinant of firm choices is one fraught with uncertainty; there is no unambiguously accepted theory of firm size. Hence the best explanation of why size seems to consistently show up as a statistically significant variable in firm choice regressions may be that size is a proxy for some other firm characteristic. In this case, firm size may very well be proxying for stability of cashflows. Larger firms tend to be established firms and such firms tend to have stable cashflows. Further, if one thinks of a firm as a portfolio of projects, not all perfectly correlated, then a larger firm would have a greater potential for diversification across projects, leading to lower cashflow volatility.[9] Lower cashflow volatility means that the firm can have higher leverage because for a given level of leverage, the probability of

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[9] Assuming that there are minimum sizes for projects.

bankruptcy, i.e. the probability of not having enough funds to make promised payments on the debt is lower. The observed positive coefficient of size is consistent with this explanation.

We included the firm's beta as an explanatory variable, on the assumption that beta and return volatility would be positively correlated. And since return volatility and cashflow volatility are probably correlated (since a primary mover of prices is news regarding the firms future cashflow prospects), higher beta would imply lower financial leverage. In the table above, firms with high beta have higher leverage. This last fact is inconsistent with standard capital structure theory, and we will come back to it, later. Incidentally, we do not compute the firm beta, ourselves. Rather, we use the value provided by CMIE. This value is computed by regressing weekly firm returns on the CMIE Overall Share Price Index, using data for the last five years.[10]

We have two variables that measure the profitability of a firm – the Profit Margin and the Cashflow-to-Assets ratio. The Profit Margin is measured as the ratio of Net Income to Sales, while the Cashflow-to-Assets is measured as the ratio of Operating Cashflow before Working Capital Changes to Total Assets. In theory, the greater the ability of a firm to generate cashflow, the greater is its ability to support debt. Hence we would expect a positive relationship between financial leverage and measures of cashflow. The Profit Margin variable has a positive coefficient as expected, but it is not

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[10] Another explanation for this might be that beta is not a determinant of financial structure, but rather that financial structure determines beta. This could happen in the following way. Suppose that the firm's asset beta is a poor measure of the volatility of cashflows. Then asset betas would be uncorrelated with debt-equity ratios. However, a firm's equity beta is an increasing function of the debt-equity ratio of the firm. Including a firm's equity beta as an explanatory variable in a debt-equity ratio regression might then lead to a positive coefficient for the equity beta simply because it is a proxy for the debt-equity ratio, itself!

significant; however, the Cashflow-to-Assets variable seems to behave perversely with a negative coefficient.

Finally, we have three other variables measuring asset quality – Capital Intensity measured as the ratio of Net Fixed Assets to Total Assets; the Intangibles-to-Assets ratio computed as the ratio of Intangible Assets to Total Assets; and the Market-to-Book ratio computed as the ratio of Market Value of Equity to Book Value of Equity. Capital Structure theory suggests that tangible assets provide greater debt capacity, since the market for tangible assets is more liquid relative to intangible assets and because tangible assets tend to have multiple uses and therefore do not lose value when a firm's fortunes decrease. On this basis, we expect a negative coefficient for the Intangibles-to-Assets ratio and a positive slope coefficient for Capital Intensity. On the other hand, higher Market-to-Book values reflect the existence of growth options in the firm's asset structure; these decrease in value when the firm's prospects drop and are rarely marketable. Hence Market-to-Book would enter the regression with a negative slope. These signs are all as predicted. In addition, we included dummy variables for the years 2001-2007, all of which were significant. The significance of the year dummies perhaps indicates omitted variables.

In order to measure cashflow variability more precisely, we computed another variable, Cashflow_Var, which is computed as the variance of cashflows for each company over the past five years. This variable would be expected to correlate negatively with financial leverage, since the higher the volatility of cashflows, the higher the probability of bankruptcy for any fixed level of financial leverage, as explained earlier. We re-ran our regressions using this additional variable. This time, we also allowed for firm fixed effects. While the results are, by and large, similar to those in the previous regression, we see that the inclusion of the variance of cashflows changes the picture in one important respect. We see, in model 4 of Table 2, that once we include the

variance of cashflows as an independent variable and exclude firm fixed effects, the firm's exports are no longer significant. This suggests the possibility that the statistical significance of the firm exports variable in the initial regression was due to its being a proxy for cashflow variance.**11**

Table 2: Financial Leverage as a function of firm characteristics and exports, including direct measures of Cashflow Volatility and firm fixed effects

	Model 1		Model 2		Model 3		Model 4	
	Coeff	p-value	Coeff	p-value	Coeff	p-value	Coeff	p-value
Constant	-5.574	0.000	-5.018	0.000	-7.240	0.000	-5.179	0.000
Log(Exports/Sales)	**0.014**	0.019	**0.016**	0.001	**0.030**	0.033	0.006	0.466
Log(Assets)	**0.506**	0.000	**0.266**	0.000	**0.828**	0.000	**0.255**	0.000
Capital_Intensity	**2.747**	0.000	**4.326**	0.000	**2.397**	0.000	**4.210**	0.000
Profit Margin	0.000	0.285	0.000	0.206	0.000	0.904	0.001	0.310
Intangibles-to-Assets Ratio	**-1.362**	0.010	**-4.888**	0.000	1.199	0.325	**-2.526**	0.002
Market-to-Book Ratio	-0.001	0.768	**-0.092**	0.000	**0.038**	0.027	**-0.167**	0.000
Beta			**0.077**	0.000			**0.423**	0.000
Cashflow/Assets	-0.018	0.615	**-0.097**	0.068	**-0.331**	0.054	**-1.188**	0.000
Cashflow_Var					-8×10^{-9}	0.503	**-26×10^{-9}**	0.000
Cross-section fixed (dummy variables)	**YES**				**YES**			
Period fixed (dummy variables)	**YES**		**YES**		**YES**		**YES**	
R-squared		0.767		0.175		0.880		0.160
Adjusted R-squared		0.717		0.174		0.806		0.157
Sample	2000-2007		2000-2007		2005-2007		2005-2007	
Periods included	8		8		3		3	
Cross-sections included	2069		1882		1455		1445	
Total panel (unbalanced) observations	11721		11291		3846		3832	

Note: Coefficients in bold (other than the constant) indicate significance at the 5% level of significance.

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11 On the other hand, if we allow for firm fixed effects as well, firm exports continue to be significant. This needs to be examined further.

C. Export Intensity and Financial Leverage:

We noted above that the positive correlation of exports with financial leverage may be because of the fact that exporting firms tend to have lower cashflow variability. However, this is not at all conclusive for several reasons – one, including firm fixed effects causes the export variable to be significant; two, the coefficients of the Cashflow_Assets is significant, but negative; three, the coefficient of beta is unexpectedly positive. These perverse results may mean that there are omitted variables that are not being captured in the current regressions.

To throw further light on the importance of export intensity in determining capital structure, we ran the regressions year-by-year. The results are reported in Table 3. In these regressions, we used only data for that particular year and so did not include the variance of cashflows as an independent variable. We did not estimate the equations as a system and so we cannot test whether the sign of the coefficients are different across years. However, broadly speaking, it would seem that export status becomes less important over time. In future work, we will include cashflow variance as an independent variable. If the regressions are not being estimated as a system, then there should be no problem with computing the variance over the five years previous to the regression; this would allow us to run year-by-year regressions for the years 2005-2007, but not for previous years. Alternatively, we could exclude the cashflow variance variable, but estimate the eight regressions as a system to test for changes in the effect of the export variable over time.

Table 3: Financial Leverage as a function of firm characteristics and exports, year-by-year regressions

Panel A: 2000-2003

	2000		2001		2002		2003	
	Coeff	p-val	Coeff	p-val	Coeff	p-val	Coeff	p-val
Constant	-4.169	0.000	-4.639	0.000	-5.347	0.000	-5.216	0.000
Log(Exports/Sales)	**0.030**	0.013	**0.028**	0.029	**0.023**	0.107	0.019	0.163
Log(Assets)	**0.283**	0.000	**0.343**	0.000	**0.330**	0.000	**0.311**	0.000
Capital_Intensity	**3.445**	0.000	**3.751**	0.000	**4.606**	0.000	**4.834**	0.000
Profit Margin	0.000	0.190	0.001	0.380	0.000	0.949	-0.002	0.641
Intangibles-to-Assets Ratio	**-4.713**	0.003	**-9.050**	0.000	**-7.195**	0.000	**-6.665**	0.000
Market-to-Book Ratio	**-0.060**	0.000	**-0.372**	0.000	**-0.031**	0.027	**-0.322**	0.000
Beta	0.018	0.573	**0.095**	0.039	0.041	0.244	0.036	0.321
Cashflow/Assets	**-1.314**	0.052	**-2.035**	0.005	**-1.071**	0.000	**-1.707**	0.004
R-squared	0.210		0.220		0.204		0.213	
Adjusted R-squared	0.205		0.215		0.199		0.208	
Cross-sections included (N)	1286		1317		1329		1358	

Panel B: 2004-2007

	2004		2005		2006		2007	
	Coeff	p-val	Coeff	p-val	Coeff	p-val	Coeff	p-val
Constant	-4.846	0.000	-4.919	0.000	-5.249	0.000	-5.574	0.000
Log(Exports/Sales)	**0.028**	0.039	0.002	0.868	0.018	0.200	0.015	0.255
Log(Assets)	**0.300**	0.000	**0.238**	0.000	**0.247**	0.000	**0.254**	0.000
Capital_Intensity	**4.162**	0.000	**4.451**	0.000	**4.599**	0.000	**3.940**	0.000
Profit Margin	0.003	0.477	0.002	0.464	0.000	0.392	0.002	0.330
Intangibles-to-Assets Ratio	**-5.080**	0.001	**-2.442**	0.050	**-2.546**	0.061	**-3.061**	0.025
Market-to-Book Ratio	**-0.400**	0.000	**-0.205**	0.000	**-0.143**	0.000	**-0.159**	0.000
Beta	**0.071**	0.082	**0.094**	0.034	**0.295**	0.000	**0.971**	0.000
Cashflow/Assets	-0.127	0.495	-0.403	0.183	0.040	0.525	**-1.670**	0.001
R-squared	0.202		0.175		0.169		0.163	
Adjusted R-squared	0.197		0.170		0.165		0.159	
Cross-sections included (N)	1391		1452		1529		1629	

Note: Coefficients in bold (other than the constant) indicate significance at the 5% level of significance.

In addition to our previous caveats, it must also be noted that we have not explicitly considered the fact that firms endogenously choose to export. In addition, capital structure might be a determinant of a firm's export status. Such a hypothesis might go as follows. Firms in the export business are exposed to a lot of uncertainty – the business environment is constantly changing because these firms have to compete with other firms that operate internationally.[12] It is well known that a consequence of high financial leverage is loss of flexibility, since these firms must make promised payments to debtholders each period, and further may have to satisfy various covenants in the bond indenture restricting the firm from taking various actions. Thus, on the one hand, financial leverage is concomitant with restrictions on the actions of firm executives. The export business requires, on the other hand, a high level of entrepreneurial and management skills and entrepreneurs, as is well known, do not function well in a constrained environment. As a result, they tend to gravitate to businesses where there is not a lot of debt, which brings in its wake, covenantal and other restrictions. They probably tend to gravitate to industries that would, in any case, not have much debt. However, even in any given industry, they would have a predilection for less debt than other firms. If this is true, firms involved in export would tend, as a whole, to be characterized by low financial leverage even after adjusting for firm characteristics. While this is not what we see in our results, such a hypothesis points out the importance of explicitly recognizing the endogeneity of firm's exports, as well as a possible role for capital structure in the firm's decision to export.

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[12] In contrast, domestic firms are protected to some extent because foreign firms will be less quick to enter the domestic market because of the need to make an investment in fixed costs (cost of dealing with a new bureaucracy, steep learning curve etc.).

III. Conclusion

In this paper, we investigate the financial leverage choices of exporting firms in India. We find that, after controlling for other variables, exporting firms use more financial leverage than non-exporting firms. Our results are broadly consistent with the notion that exporting firms' cashflows are less variable because of diversification of revenue flows over different markets. However, more work is needed to be sure of this.[13]

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[13] In future work, we plan to consider other econometric formulations. For example, we will see if the leverage ratio determines the decision to export or the other way around, as assumed here. Second, instead of taking logarithms, we could use a censored-data model. Finally, we could also model the decision to export first and then look at the financial leverage of firms that export versus firms that don't export. Since firms choose their export status, this might be relevant in determining the proper model for financial leverage. We will also explicitly model the endogeneity of firm exports by estimating a system of equations, one which determines export status, and another which determines the level of leverage, where export status would be an explanatory variable. Finally, we will explore the importance of export status over time.

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