



Export Intensity and Financial Policies of Indian firms

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Elena Goldman

P.V. Viswanath

Pace University



Why look at Exporting Firms' Capital Structure

- Look at which firms succeed in exporting - does financial structure play a part?
- Test theories of what determines whether a firm exports or not.
- Test theories of capital structure
- We will approach this primarily from the point of view of testing theories of capital structure.
- However, our results will have implications for the other two objectives, as well.

Why should leverage differ by export status?

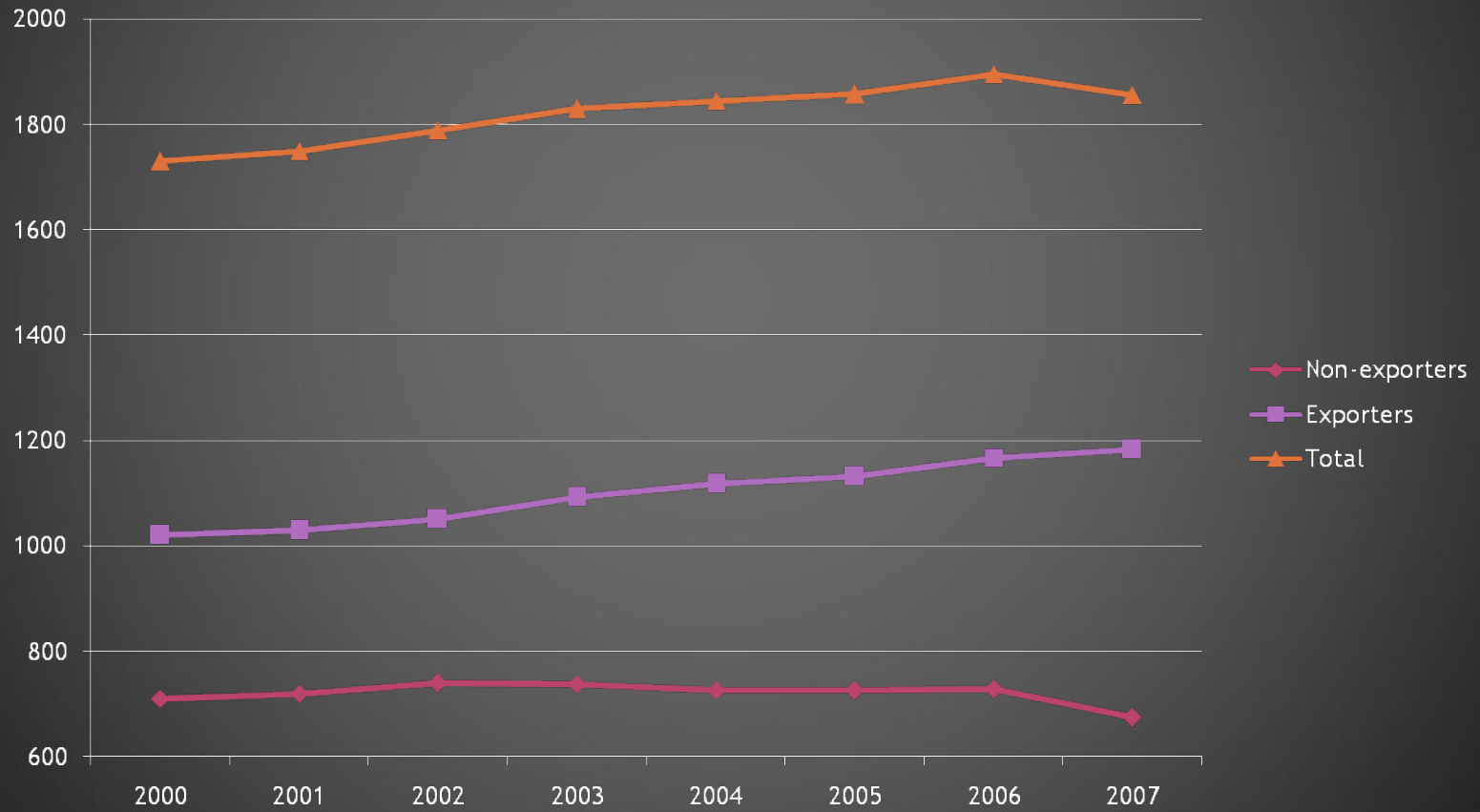
- Many researchers document lack of linkages between equity markets in developed and developing markets
 - Phylaktis and Ravazzaolo, (*Journal of International Financial Markets, Institution, and Money*, 2005)
 - Fadhlaoui, Bellalah, Dherry and Zouaouil (JIBS, 2008).
- Attributed to
 - barriers to foreign investment flows on emerging markets in order to preserve the control of national companies
 - the asymmetric information on securities in emerging markets
 - strong controls of exchange and the lack in free trade of emerging markets with international markets.
- This suggests a similar lack of correlation between developed and emerging market economies.
- If so, firms in emerging markets could stabilize their revenue flows by exporting to developed markets.
- This, in turn, would allow them to utilize additional leverage



Data Source

- We use data from the CMIE Prowess database.
- Data is available from the 1990s onwards.
- However, there are a lot of policy changes in the early years.
- We use data for the years 2000-2007.
- We restrict ourselves to firms on the A and B lists of the Bombay Stock Exchange.
- These tend to be larger and more liquid firms. This may cause some bias in the results, in that the findings may be inapplicable to smaller and less viable firms.
- On the other hand, the results can be interpreted as providing information regarding the capital structure of the more successful firms - there is no inherent bias in such an interpretation.

Number of firms in the sample



Leverage according to Export Status

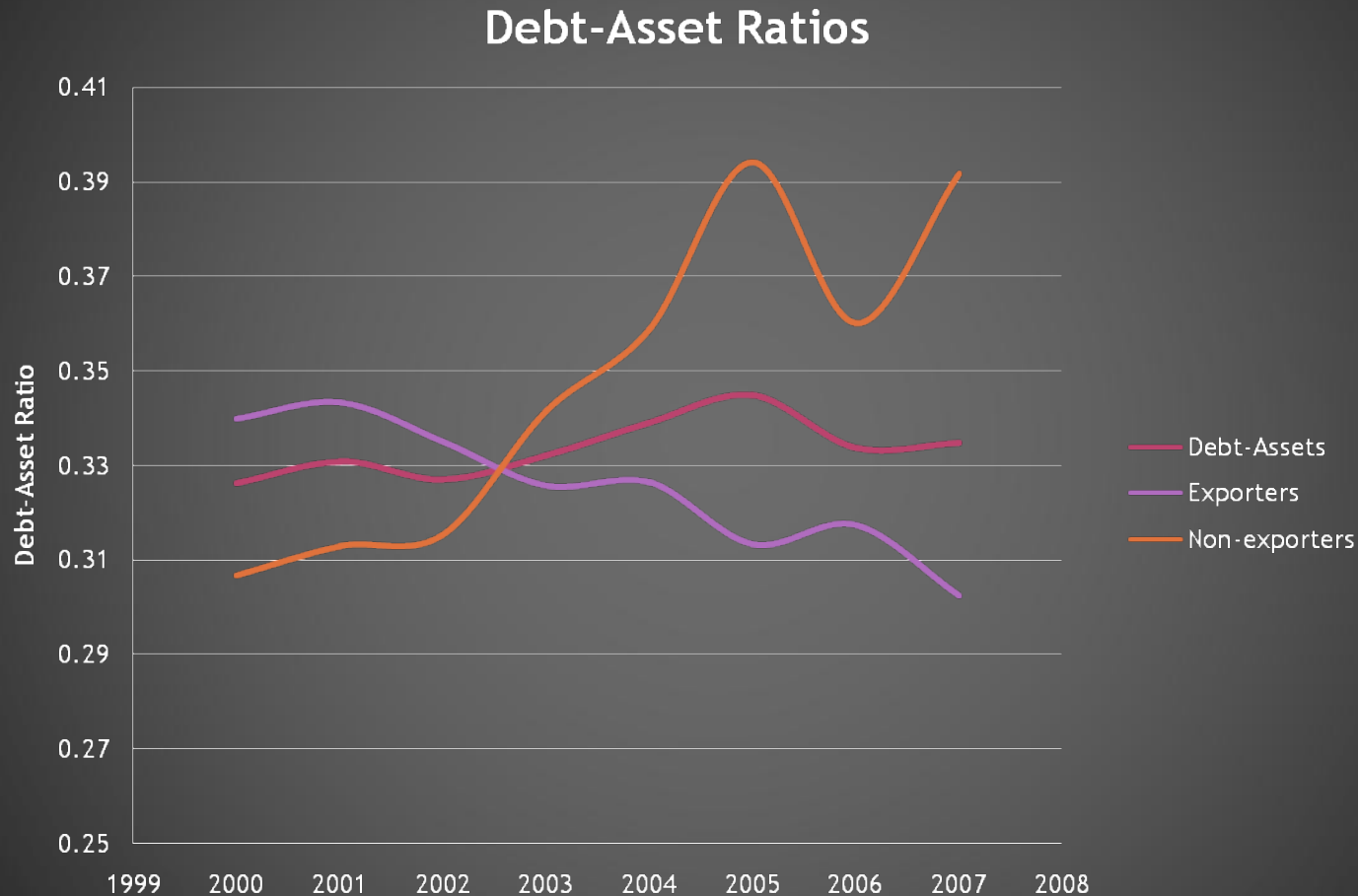
Independent Variable: Debt-Asset Ratio using Book Values

	Mean	Std. Dev.	Obs.
Non-exporters	34.74%	60.41	5762
Exporters	32.49%	27.87	8793
All	33.38%	43.76	14555

Method	df	Value	Probability
t-test	14553	3.037936	0.0024
Satterthwaite-Welch t-test	7385.622	2.651614	0.008
Anova F-test	(1, 14553)	9.229056	0.0024
Welch F-test	(1, 7385.62)	7.031059	0.008

Contrary Conclusion: Exporting firms have lower financial leverage

Firm Leverage Over Time



Clearly, the story is more complex!



Financial Leverage Controlled for Firm Characteristics

- While firms do make their own choices as to whether they should enter export markets or not, not all firms in all industries are able to export.
- There are many theories explaining the pattern of exports:
 - Absolute and Comparative Advantage
 - Theory of Factor Proportions
 - Overlapping Product Ranges Theory
 - Product Cycle Theory
 - Porter's Competitive Advantage of Nations
- There are exogenous firm and industry characteristics that differ between exporters and non-exporters. Some of these might be related to capital structure.
- If so, we have to adjust for these characteristics before looking at how capital structures differ by export status. Else, we might find export status significant when actually the data would be simply expressing a standard result from capital structure theory!

Independent Variables in Model

- Firm Size, measured as $\text{Log}(\text{Assets})$
- Level of Cashflows
 - Profitability (Net Income to Sales)
 - Cashflow-to-Assets (Operating Cashflow before Working Capital Changes to Total Assets)
- Asset Quality
 - Capital Intensity (Net Fixed Assets to Total Assets)
 - Intangibles (Intangible Assets to Total Assets)
 - Growth Options (Mkt Val of Equity to Bk Val)
- Variability
 - Systematic Risk of Assets (Asset Beta, computed by taking stock beta adjusted for leverage)
 - Cashflow Variance (Variance of Operating Cashflows over last five years)

Results with Explanatory Variables

- The relevance of the export indicator variable drops as we include fixed effects and then further drops as we included explanatory variables.
- The coefficient drops from 0.064 to 0.025 to 0.017, although it remains significant even in the final regression.

Leverage Ratios Explained (2000-2007)

	Model A		Model B		Model D	
	Coeff	p-value	Coeff	p-value	Coeff	p-value
C	-2.078	0	-2.349	0	-5.5725	0
LOG(EXPORT_SALES)	0.064	0	0.025	0	0.01694	0.006
LOG(ASSETS)					0.60776	0
CAPITAL_INTENSITY					2.63039	0
PROFIT_MARGIN					0.00044	0.269
INTANGIBLES-TO-ASSETS					-0.977	0.065
MARKET-TO-BOOK					0.0006	0.909
Asset Beta					-0.6876	0
CASHFLOW/ASSETS					0.02038	0.554
Cross-section fixed (dummy variables)			YES		YES	
Period fixed (dummy variables)			YES		YES	
R-squared	0.01		0.73		0.77	
Adjusted R-squared	0.01		0.68		0.72	
Cross-sections included	2247		2247		1882	
Total panel (unbalanced observations)	14555		14555		11291	

Coefficients of variables that are significant at the 5% or 10% level in bold

Interpretation of Explanatory Variables

- Larger Firms have more debt
 - This may have to do with greater stability of large firms and some too-big-to-fail characteristic that is not properly captured by the other explanatory variables.
- Firms that are more capital intensive tend to have more debt
- Firms with more intangibles have less debt
 - This is consistent with the idea that fixed assets are more fungible and can support more debt; intangibles are less liquid and can support less debt
- Firms with higher asset return volatility have less debt
 - The likelihood of bankruptcy is greater for these firms.



Financial Leverage Year-by-Year

	2000	2001	2002	2003	2004	2005	2006	2007
C	-4.115771	-4.53151	-5.31106	-5.15668	-4.76402	-4.79141	-4.793576	-4.43029
LOG(EXPORT_SALES)	0.029979	0.027763	0.021895	0.018365	0.026633	0.003622	0.018558	0.014299
LOG(ASSETS)	0.28568	0.351059	0.336446	0.318608	0.309879	0.245431	0.283623	0.309482
CAPITAL_INTENSITY	3.429765	3.748844	4.588227	4.798194	4.12711	4.431459	4.473692	3.847925
PROFIT_MARGIN	9.38E-05	0.00143	0.000113	-0.00228	0.002336	0.001582	0.00041	0.001385
INTANGIBLES-TO-ASSETS	-4.646514	-8.99928	-7.13444	-6.57351	-4.9811	-2.34862	-2.300674	-2.6202
MARKET-TO-BOOK	-0.059365	-0.37585	-0.03074	-0.32527	-0.40426	-0.2048	-0.150452	-0.18074
Asset Beta	-0.06894	-0.06631	-0.03926	-0.07275	-0.07603	-0.0886	-0.405988	-0.59411
CASHFLOW/ASSETS	-1.311409	-2.07413	-1.07322	-1.72551	-0.13043	-0.3834	0.058429	-1.56516
R-squared	0.21	0.22	0.20	0.21	0.20	0.17	0.17	0.18
Adjusted R-squared	0.21	0.21	0.20	0.21	0.20	0.17	0.17	0.18
Cross-sections included (N)	1286	1317	1329	1358	1391	1452	1529	1629

We see that the export-indicator variable remains always positive, as posited, and becomes insignificant after 2004

Growth firms have less debt, since growth options are more subject to agency problems

Cashflow/Assets is inexplicably negatively correlated with debt!

Regressions including Cashflow Variance (2005-7)

	Model E		Model F	
	Coeff	p-value	Coeff	p-value
C	-5.35026	0.000	-7.043	0.000
LOG(EXPORT_SALES)	0.025942	0.404	0.016	0.201
LOG(ASSETS)	0.728973	0.000	0.859	0.000
CAPITAL_INTENSITY	1.876672	0.000	2.369	0.000
PROFIT_MARGIN	-1.40E-05	0.472	0.000	0.930
INTANGIBLES-TO-ASSETS	1.310609	0.010	1.340	0.246
MARKET-TO-BOOK	0.048494	0.000	0.036	0.019
Asset Beta	-1.91733	0.000	-0.533	0.000
CASHFLOW/ASSETS	0.21126	0.001	-0.154	0.357
VAR (CASHFLOW)	-6.63E-08	0.000		
Cross-section fixed (dummy variables)	YES		YES	
Period fixed (dummy variables)	YES		YES	
R-squared	0.89		0.87	
Adjusted R-squared	0.82		0.80	
Cross-sections included	1445		1752	
Total panel (unbalanced) observations	3832		4610	

Two-stage LS

Instrumental Variables for first stage: Year of Incorporation,
R&D, Operating Profit Margin
Additional Explanatory Variables: Industry Dummies

Variable	Coefficient	Prob.
C	-4.76	0
EXPORT_SALES	1.19	0.355
LOG (ASSETS)	0.315	0
CAPITAL_INTENSITY	4.389	0
PROFIT_MARGIN	0	0.044
INTANGIBLESTOASSETS	-1.54	0.037
MARKETTOBOOK	-0.09	0
Asset Beta	-0.14	0
CASHFLOW /ASSETS	-0.134	0.071

The export variable is insignificant!

List of NIC-based industries

		NIC (5 decimals of NIC)
IND 1	<u>AGRICULTURE & MINING</u>	1 0000-1 4999
IND 2	<u>MANUFACTURING</u>	1 5000-3 6999
IND 3	<u>ELECTRICITY</u>	4 0000-4 4999
IND 4	<u>CONSTRUCTION</u>	4 5000-4 5301
IND 5	<u>TRADE & HOTEL</u>	5 0000-5 5000
IND 6	<u>TRANSPORT & TELECOM</u>	6 0000-6 4202
IND 7	<u>BUSINESS SERVICES</u>	6 5000-7 5000
IND 8	<u>COMMUNITY SERVICES</u>	8 0000-9 2200
IND 9	<u>MISCELLANEOUS</u>	9 3000-9 7000



Some other Preliminary Results

- Preliminary results allowing export variable coefficient to differ from industry yields heterogeneous results: positive for Agriculture, Electricity, Construction, and Community Services and negative for Manufacturing, Trade & Hotel, Business Services, Transport/Telecommunications, and Miscellaneous.
- Used Redefined Export Variable
$$\text{Export Var} = 1 - 2 * |\text{exports/sales} - 0.5|$$

If exports are close to half of sales, the variable value is 1; else, it is equal to zero.
Value of 1 indicates greater diversification potential for exports
- Similar Results with new Export Variable

Conclusions

- Firms that export seem to have more financial leverage after adjusting for other firm-specific variables as conjectured
- Part of this increased financial leverage seems to be due to the lower cashflow variability of exporting firms, as seen from the negative coefficient of the asset beta and $\text{Var}(\text{Cashflow})$ variables.
- However, we have not yet showed a direct connection between lower cashflow variability of exporters and their capital structure.
- Furthermore, there is some evidence that the results may vary by industry.

Future Work

- Redo analysis using market value of equity in measure of financial leverage
- Compute equity betas year-by-year
- Look at correlation between export revenues and domestic revenues
- Investigate the effect of exporting on cashflow variance at the firm level.
- Compare volatility of exporters and non-exporters within a given industry.
- Explicitly consider the endogeneity of the firm's decision to export by modeling it.
- Other issues?