Leverage and trade unionism in Indian industry: An empirical note

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Introduction

The product market and input market effects of capital structure link the financial and real activities of a firm. A significant body of theoretical literature relates financial structure to market conduct and postulates strategic use of leverage by firms (Dasgupta and Sengupta, 1993; Cavanaugh and Garen, 2004). Notwithstanding the advancements in the theoretical literature, empirical evidence on this aspect is far less convincing. The present note addresses this gap in the literature by demonstrating that strategic incentives from input markets have an impact on financing decisions.

Existing evidence on the link between collective bargaining and capital structure determination relies on cross-sectional comparisons that may be affected by omitted variable bias. Bronars and Deere (1991), for instance, show that unionization rates are correlated with financial leverage at the industry level. This sort of analysis, however, fails to take cognizance of the strategic increases in debt from the more 'mechanical' balance sheet effects.

We identify the strategic effect empirically using profitability across industries which reflects differences in the specific product markets in which industries compete. When labor and management bargain, a union can claim a portion of the firm's excess liquidity – its operating cash flow - net of any required debt payments. With limited liability and positive debt balances, greater underlying profit is one factor that increases expected excess liquidity and a firm's exposure to union rent seeking. Greater profitability of potential projects implies that the firm must, on average, maintain greater excess liquidity in order to fund the same marginal project. Profitable firms are thus more vulnerable to union rent seeking and therefore, have greater incentive to use debt to shield liquidity from workers in bargaining.

The remainder of the paper proceeds as follows. The empirical model is presented in the subsequent section, along with the data base employed for the purpose. This is followed by a discussion of the results. The final section concludes.

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[1]The views expressed and the approach pursued are strictly personal.

II. Empirical Strategy

We use industry-level data on bargaining as a proxy for union bargaining power and estimate its effect on the firm's choice of capital structure. The empirical equation for industry j at time t can be specified as follows :

$$Debt_{j,t} = \eta_j + \alpha_2 * Coverage + \alpha_3 * \text{Pr}\,ofit + \alpha_4(Coverage * \text{Pr}\,ofit) + \beta * \{Control\ \text{var}iables) + \zeta_{j,t}$$

(1)

where (ignoring subscripts) *Debt* is the debt profile of the industry which is modeled as function of the proportion of employees covered by bargaining (*Coverage*), industry profits (*Profit*) and the interaction of *Coverage* and *Profit*, a set of control variables [*Controls*] and two-digit NIC industry fixed effects, η_j. Finally, ζ denotes the error term.

Table 1: Variable definitions and summary statistics

Variable	Definition (Data source)	Mean	Std. Devn.
Debt	Logarithm of total borrowings (Prowess)	3.633	0.756
Bank debt	Logarithm of bank borrowings (Prowess)	7.146	1.604
Leverage	Bank borrowings / total borrowings (Prowess)	0.335	0.137
Debt equity ratio	Total borrowings/(equity *plus* reserves) (Prowess)	1.344	1.427
Altman Z	3.3 (PBIT/total asset)+1.0 (Sales/total asset)+1.4 (retained profit/total asset)+1.2 (working capital/total asset) (Prowess)	2.980	4.172
log sales	logarithm of total sales (Prowess)	3.962	0.730
tangible	land and building *plus* plant and machinery/total asset (Prowess)	0.467	0.122
Coverage	number of employees registered as union members/total number of employees (Indian Labor Yearbook)	0.227	0.199

As regards the dependent variable, we employ both the level of debt as well as its composition.[2] Among the independent variables, *Coverage* is measured as the number of employees registered as trade union members divided by total number of employees. The profitability variable, *Profit* is measured as the ratio of operating profits to total assets. The controls include are: the proportion of tangible assets, log sales and Altman-Z score. Finally, the industry-specific fixed effects capture the effect of omitted variables specific to the concerned industry. For identification purpose, the dummy variable for electricity industry (NIC code 40) is omitted. Table 1 presents the relevant details.

The analysis covers 16 industries for 1992-2004. We matched the data from *Prowess* with those obtained from the Annual Survey of Industries (ASI). As it stands, the ASI data are

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[2] We employ bank debt since evidence suggests that bank debt is the preponderant form of debt employed by firms (Ghosh, 2007).

reported at the 2-digit NIC classification code. The CMIE data, on the other hand, is firm-level data. The two data sets were suitably integrated to ensure compatibility.

III. Results

The interaction term of *Coverage* and *Profit* is positive and statistically significant at the 0.01 level. Thus, the interaction provides a margin for detecting strategic response to bargaining (Table 2). To interpret the magnitude of this effect, consider two industries – one with profitability one per cent more than the other. An increase in the industry's union coverage by 10 percentage points is associated with around 67 basis point greater increase in overall debt for the more exposed firm.

Table 2: Leverage and trade unionism - Baseline regressions

Variable	Debt	Bank debt	Debt equity ratio
Constant	0.594 (0.189)***	-1.523 (0.578)***	18.726 (2.406)***
Coverage	0.0002(0.0005)	-0.0002 (0.001)	0.0009(0.006)
Coverage*Profit	**0.067 (0.019)***	0.070 (0.061)	**-0.417 (0.242)***
Profit	-0.019 (0.003)***	-0.012(0.011)	0.065 (0.049)
Controls			
Altman Z	-0.009 (0.004)**	-0.021(0.012)*	-0.032(0.053)
Log (sales)	0.916 (0.045)***	2.344 (0.137)***	-3.371 (0.568)***
tangible	-0.129 (0.155)	-0.325(0.473)	-3.151(1.968)*
industry dummies	included	included	Included
Industries; time pd.	16; 1992-2004	16; 1992-2004	16; 1992-2004
R-squared	0.993	0.986	0.682
Prob > chi-sqaure (p-Value)	0.000	0.000	0.000

Standard errors within parentheses
***, ** and * indicate statistical significance at 1, 5 and 10%, respectively.

Among the control variables, the coefficient on Altman-Z is negative, since higher probability of bankruptcy leads firms to lower their debt profile. Bigger firms assume higher debt, as expected from theory. The fit of the model is quite high, as evidenced from the high value of R-square across all models.

In the second model, we employ logarithm of bank debt as the explanatory variable. In this case, the coefficient on the interaction term is not statistically significant, which suggests that profitable industries do not alter their bank debt in response to higher union militancy. Combining Models I and II, it seems that the response of industries to higher unionism is to raise their debt profile, primarily by altering their non-bank debt.

With debt-equity ratio is the dependent variable (Model III), the coefficient on the interaction term is negative and on the borderline of significance, which suggests that the response of profitable industries to lower union militancy is to raise their debt equity ratio.

Ultimately, much of workers' bargaining power is derived from credible threats to withhold labor services. To mitigate these threats, firms may strategically maintain costly 'buffer' inventories, which increase the cost of a strike borne by workers relative to those borne by the firm. Theoretical analysis suggests that, in anticipation of a strike threat, firms often over-employ in an earlier period so as to build up an inventory that can be employed in order to offset the revenue loss during the strike period (Clark, 1991). Subsequent work by Coles and Smith (1998) shows that access to strategic stock by the firm in the process of union-firm bargaining depresses the negotiated wage.

Table 3: Unionization and inventory policy

Variable	Inventories	Raw materials	Finished goods
	Model I	Model II	Model III
Coverage	0.009 (0.006)	0.002 (0.005)	0.001 (0.002)
Coverage*Profit	**0.280 (0.141)***	0.145 (0.186)	**0.150 (0.083)***
Profit	-0.042 (0.049)	-0.034 (0.037)	-0.028 (0.016)*
Industry dummies	Included	Included	Included
R-square	0.961	0.877	0.931

Standard errors within parentheses
***, ** and * indicate statistical significance at 1, 5 and 10%, respectively.

Analyses of the inventory hypotheses, presented in Table 3, seems to suggest that industries appear to have been using inventories of finished goods strategically in conjunction with bargaining negotiations and this effect appears to be driven most by a build-up of finished goods inventories.

IV. Concluding remarks

Based on our analysis, the evidence suggests that the bargaining process led industries to adopt a capital structure that made them more vulnerable to cash flow shocks. As a supplier with market power, a union can demand a share of the industry's liquidity, which the industry maintains primarily to insure against negative shocks. To reduce the impact of collective bargaining on profits, the industry has the incentive to undertake costly actions that reduce its expropriable liquidity.

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