Leverage & Trade Unionism in Indian Industry : An Empirical Note

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Market power in the hands of a supplier such as a labor union affects an industry's capital structure. Using panel data techniques for 1992-2004, this note shows that industries indeed appear to employ financial leverage strategically to influence collective bargaining decisions. The estimates imply that strategic incentives from input markets have a substantial impact on financing decisions.

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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 & Sengupta 1993, Campello 2003, Cavanaugh & 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 labour 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. Collective bargaining, therefore, imposes a greater threat to a firm when a firm maintains higher levels of excess liquidity. With limited liability and positive debt balance, greater underlying profit is one factor that increases expected excess liquidity and a firm's susceptibility 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. Consequently, evidence of the strategic effect can be found by analyzing the interaction between union bargaining power and firm profitability.

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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Empirical Strategy

The degree of union bargaining power in negotiations with a given industry is likely to increase with the proportion of employees covered by the bargaining process. In industries with greater coverage, union-organized job actions are likely to be more costly, and as a result, industry-wide policies are more likely to be affected by bargaining. 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.

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The empirical equation for industry *j* at time *t* can be specified as follows :

$$Debt_{j,t} = \eta_j + a_2 * Coverage + a_3 * Profit + a_4 (Coverage * Profit) + \beta * \{Control\ variables\} + z_{j,t} \quad (1)$$

where (ignoring subscripts) *Debt* is the debt profile of the industry which is modeled as a 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. Finally, *z* denotes the error term.

As regards the dependent variable, we employ both the level of debt as well

as its composition. Accordingly, we estimate alternate specifications where the dependent variable is defined in terms of both the level of debt (such as total debt and total bank debt) as well as its composition (defined in terms of the debt equity ratio and the proportion of bank debt to total debt).[1]

Among the independent variables, following from the literature (Bhattacharjee & Datta Chaudhuri 1994), *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. It is demeaned (with respect to the sample mean) before it is interacted with *Coverage* to allow for a more meaningful interpretation of the interaction term. The financial controls are those typically included in leverage regressions, specifically, the proportion of tangible assets (proxy for informational asymmetry), log sales (proxy for firm size) and modified Altman-Z score (proxy for probability of bankruptcy). 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, so that the coefficients on the other industry dummies measure the response relative to this omitted category. Table 1 presents the details of the definitions and source of the concerned variables along with their summary statistics.

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

The analysis covers 16 industries for the period 1992-2004, the latest period for which data on the relevant variables is available on a consistent basis. Towards this end, we matched the data from *Prowess* with those obtained from the Annual Survey of Industries (ASI). As it stands, the ASI data are reported at the 2-digit NIC classification code. The CMIE data, on the other hand, is firm-level data. The two data sets were made compatible using the following method: the ASI data, which are reported in 2-digit NIC codes, were aggregated into 16 industries.[2] The ASI format was then used to assign general classification to the CMIE-listed firms. In this fashion, we arrived at consistent 2-digit level classifications by suitably integrating the CMIE data with the ASI data.

The Results

The results emanating from the analysis are presented in Table 2. As evident, 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. To interpret the magnitude of this effect, consider two industries – one with profitability one per cent more than the other. An increase in

2. These include: NIC 20-21 (food products), 22 (beverages), 23 (cotton), 24 (wool, silk and man-made fiber), 25 (jute), 26 (textiles, including wearing apparel), 27 (wood), 28 (paper), 29 (leather), 30 (basic chemicals), 31 (rubber, plastic, petroleum and coal), 32 (non-metallic minerals), 33-34 (basic metals and metal products), 35-36 (machinery and equipment), 38 (other manufacturing) and 40 (electricity).

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
Inventories	total value of inventories/sales (Prowess)	1.983	4.057
Raw materials	total value of raw materials/sales (Prowess)	0.768	1.701
Fin. Goods	total value of finished goods/sales (Prowess)	0.499	1.016
Coverage	number of employees registered as union members/total number of employees (Indian Labor Yearbook)	0.227	0.199

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.

Profitable industries are more susceptible to union capture, especially if they exhibit greater union coverage, impelling these industries to increase overall debt.

A key feature of industry's debt policy is that it is generally set unilaterally, without consent of the labour (Baldwin 1983). Management fixes the capital structure (typically at the firm level), subject to capital market constraints. When a union has market power but cannot commit to future negotiating positions (Grout 1983), management will likely consider labor market ramifications in choosing its debt policy. Judged from this standpoint, the present results seems to suggest that profitable industries are more susceptible to union capture, especially if they exhibit greater union coverage, impelling these industries to increase overall debt.

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

Table 2: Leverage and Trade Unionism - Baseline Regressions

Variable	Debt Model I	Bank debt Model II	Debt equity ratio Model III	Leverage Model IV
Constant	0.594 (0.189)***	-1.523 (0.578)***	18.726 (2.406)***	-0.286 (0.126)**
Coverage	0.0002 (0.0005)	-0.0002 (0.001)	0.0009 (0.006)	-0.0002 (0.0003)
Coverage*Profit	0.067 (0.019)***	0.070 (0.061)	-0.417 (0.242)*	-0.031 (0.013)
Profit	-0.019 (0.003)***	-0.012 (0.011)	0.065 (0.049)	0.009 (0.002)
Controls				
Altman Z	-0.009 (0.004)**	-0.021 (0.012)*	-0.032 (0.053)	-0.0006 (0.003)
Log (sales)	0.916 (0.045)***	2.344 (0.137)***	-3.371 (0.568)***	0.102 (0.029)
Tangible	-0.129 (0.155)	-0.325 (0.473)	-3.151 (1.968)*	-0.094 (0.103)
Industry dummies	included	included	included	included
Number of industries	16	16	16	16
Time period	1992-2004	1992-2004	1992-2004	1992-2004
R-square	0.993	0.986	0.682	0.846
Prob > chi-sqaure (p-Value)	0.000	0.000	0.000	0.000

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

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.

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The third and fourth models explore the composition of debt as opposed to the level of 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.

The final specification focuses on the composition of bank debt. In this case, the coefficient on the interaction term *Coverage*Profit* is not significant, corroborating the results obtained in Model II.

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 increases the cost of a strike borne by workers relative to those borne by the firm. Compared to materials and goods in earlier stages of the production process, inventories of finished goods provide the most effective insurance and deterrence against employee job actions. Theoretical analysis seems to suggest 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.

Industries appear to have been using inventories of finished goods strategically in conjunction with bargaining negotiations.

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 negoti-ations. As expected, the effect appears to be driven most by a build-up of finished goods inventories (Model III), although raw materials seems to exert limited influence on firm's inventory policy. Although these results are persuasive, corroboratory evidence from the labor law analysis would be ideal. Unfortunately, disaggregated data drilling down inventories by stage-of-production is not readily available for the period of analysis and evidence based on total inventories are only indicative.

Table 3: Unionisation and inventory policy

Variable	Inventories Model I	Raw materials Model II	Finished goods 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

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

Concluding Remarks

The bargaining process led industries to adopt a capital structure that made them more vulnerable to cash flow shocks.

Anecdotal evidence suggests that the capital structure of relatively unionized firms seems to be significantly different from those which are relatively less unionized. A natural question to ask is what role does unionization plays in this regard. Since unionization data is not available at the firm-level, we employ industry-level unionization information to explore this hypothesis. 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. Consequently, the bargaining solutions emanating from the process can yield outcomes that are not Pareto-optimal.

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