



Munich Personal RePEc Archive

Does monetary policy matter for corporate governance? Firm-level evidence for India

Ghosh, Saibal and Sensarma, Rudra

Reserve Bank of India

2004

Online at <https://mpra.ub.uni-muenchen.de/19756/>

MPRA Paper No. 19756, posted 07 Jan 2010 08:37 UTC

DOES MONETARY POLICY MATTER FOR CORPORATE GOVERNANCE? FIRM-LEVEL EVIDENCE FROM INDIA

Saibal Ghosh* and Rudra Sensarma**¹

Abstract

The paper assembles data on over 1,000 manufacturing and services firms in India for the entire post-reform period from 1992 through 2002 to examine the association between corporate governance and monetary policy. The findings suggests that (a) public firms are relatively more responsive to a monetary contraction *vis-à-vis* their private counterparts; and, (b) quoted firms lower their long-term bank borrowings in favour of short-term borrowings, post monetary tightening, as compared with unquoted firms. A disaggregated analysis based on firm size and leverage above a certain threshold validates these findings. The study concludes by analyzing the broad policy implications of these findings.

Key words: corporate governance, relationship lending, monetary policy, leverage

JEL Classification: G 32, E 52

INTRODUCTION

Two main competing paradigms dominate the literature on corporate financial structures. The first strand of thinking argues that there is an optimal financial structure in every firm that depends on various attributes of the firm. According to this view, the firm is seen as choosing its financial structure by minimizing its overall cost of capital, which is a weighted average of the cost of equity and the cost of debt (Jensen and Meckling, 1976). The second approach to financial structure choice by firms postulates that firms establish a hierarchy of preferences towards sources of funds in that they first fully utilise all available internal resources and only in case their financing needs are not satisfied through this route, they approach the market for external sources (Myers and Majluf, 1984). Even in this case, they prefer to raise money through debt, which does not suffer

¹(*corresponding author) Department of Economic Analysis and Policy, Reserve Bank of India, Fort, Mumbai 400001 INDIA (saibalghosh @rbi.org.in). and ** Department of Economic Analysis and Policy, Reserve Bank of India, Fort, Mumbai 400001 INDIA (rsensarma@ rbi.org.in).

from asymmetric information problems and only if they cannot meet their remaining requirement through this source, they access the equity route for resource augmentation.

Although information asymmetry lies at the core of the Myers-Majluf argument, it is easy to discern reasons as to why firms might have the same type of lexicographic preference towards sources of finance. The most obvious is that of control and the threat of takeover that equity carries with it. Others relate to the fact that firms might not be keen to reveal their investment plans to public financiers and consequently, prefer to be financed by private capital (such as bank loans). Another possibility might be simply the fact that firms are too small to credibly signal quality of their investment project to private financiers, and as a result, rely on banks for supplementing their capital base.

On the other hand, recent insights in monetary theory have underscored the fact that it is important to analyze the differences in impact of monetary policy on various types and classes of firms. The first line of thinking, the *credit view* (Bernanke and Gertler, 1995) observes that bank-dependent firms are more likely to be affected by a monetary contraction than firms that rely less on bank financing and more on capital markets. Public firms will be able to adjust their debt positions, e.g., decrease their leverage by issuing equity, while private firms cannot do so if they face higher informational costs. As a consequence, private firms will face higher user cost of capital and probably make lower investment. The second view, the *relationship lending view*, predicts that higher costs of borrowing will induce public firms to adjust their loan portfolio more than private firms. This view opines that bank-dependent firms are more likely to accept higher costs of bank borrowing, because they will benefit from the relationship with the bank.

A third strand of the literature concerns corporate governance. There are four paradigms on corporate governance. The first, *direct control via debt*, implies relationship banking: companies have exclusive financing relationships with a small

number of creditors and equity holders. The second, *market control via equity*, implies that firms that deviate most extensively from shareholders objectives, and consequently tend to have lower market value as shareholders dispose of their holdings, have a greater likelihood of being acquired. The third, *market control via equity*, implies aligning the equity stakes of managers in LBOs with those of equity holders. The fourth is the *direct control via equity* wherein pressure is exerted *via* direct links from institutional investors to management, either formally through annual meetings or informally at other times.

The present paper combines these three strands of literature. In other words, it juxtaposes these viewpoints and investigates the association among corporate finance, corporate governance and monetary policy in India against the backdrop of a decade of economic reforms. Therefore, the line of research pursued in this paper is the interlinkage of the relationships among corporate finance, corporate governance and monetary policy. Empirical research in this area has, however, been largely confined to developed economies like United States (Oliner and Rudebusch, 1996; Kashyap *et al.*, 1993, 1996) and to a limited extent, the EU economies (de Haan and Sterken, 2000) with very limited research being forthcoming in this area in the context of developing countries. One can cite two major reasons for the same. First, until recently, the corporate sector in many developing markets encountered several constraints on their choices regarding sources of funds with rigorous constraints in accessing equity markets. As a consequence, any research on the capital structure and corporate governance features of firms could have been largely constraint-driven and hence less illuminating. Second, several developing countries, even till the late 1980s, suffered from ‘financial repression’, with negative real rates on savings and investment as well high levels of statutory pre-emptions and administered rates on lending and deposits. This could have meant restricted play of competitive forces in resource allocation and limited maneuverability of the central bank in the conduct of monetary policy.

However, questions regarding the interface between corporate governance and monetary policy have gained prominence in recent years, especially in the context of the fast changing institutional framework in these countries. Several developing countries have introduced market-oriented reforms in the financial sector. More importantly, the institutional set-up within which firms operated in the regulated era has undergone substantial transformation since the late 1980s. The move towards market-driven allocation of resources, coupled with the widening and deepening of financial markets, including the capital market, and the stringent disclosure and transparency practices consequent upon initial public offerings has provided the scope for corporates to determine their own capital choice and introduce better corporate governance practices.

The paper attempts to examine the association among corporate governance and monetary policy in India using firm-level data. The corporate sector in the country is characterised by a large number of firms, in both the public and private sectors, operating in a deregulated and increasingly competitive environment. The rigorous listing criteria for corporate houses have meant that they have to enforce strict corporate governance practices, akin to direct control *via* equity. At the same time, the monopoly of development banks in the provision of long-term debt finance has also diminished with banks being allowed to provide long-term capital to corporates. This has provided greater option to corporates to choose their capital structure. In the financial sector, the deregulation of the administered interest rate structure, lowering of statutory pre-emptions and the introduction of an auction system for Government paper has imparted greater flexibility to the central bank in its conduct of monetary policy. The changing institutional environment for corporates coupled with the increasing freedom of the central bank in monetary policy formulation provides a suitable background for testing the linkage among these issues. It however needs to be recognised that there remains the question of the role of equity-related corporate governance mechanisms. However, the

empirical analysis does not incorporate the finer details on ownership structure or features of internal corporate governance mechanisms and has, therefore, not been addressed in the present study.

Apart from attempting to be the first research paper to examine this issue in the Indian context, the major contributions of the paper is three-fold: first, the firm-level dataset employed in the study for the post-liberalisation period provides a more illuminating evidence on capital choices by firms and to what extent is the same impacted by a monetary policy shock. Secondly, the study distinguishes firms with different corporate governance features in analysing the impact of monetary policy shocks. And finally, the study examines the differential response to monetary policy for manufacturing firms as compared to those in services.

The broad findings can be summarized as follows. First, public firms in India are found to be more responsive to a monetary contraction *vis-à-vis* their private counterparts. Second, as compared with unquoted firms, quoted firms lower their long-term bank borrowings in favour of short-term borrowings, post monetary tightening. Finally, manufacturing firms are found to be relatively more responsive to monetary shock than services firms. A disaggregated analysis based on firm size and leverage above a certain threshold indicates that the above results are equally valid in the case of large firms, as well as firms, with varying degrees of leveraging.

The rest of the paper proceeds along the following lines. The next section develops a theoretical model of relationship lending. The central feature of the model is the differential response of public and private firms consequent upon a change in the policy interest rate. We make a clear distinction between public and private firms, since the subsequent analysis explicitly distinguishes these two classes of firms. Section 3 provides an overview of the received literature and explains the position of this paper in the field. The database employed in the study is detailed in Section 4. Section 5 describes

the basic hypothesis to be tested and specifies the empirical model and the methodology adopted for the study. The main findings and a discussion of the results are contained in Section 6. The ultimate section highlights the policy implications of the findings and syncopates the concluding remarks.

2. ANALYTICAL FRAMEWORK

Assume that any firm (either public or private) employs both bank and non-bank capital. The main corporate governance difference between public and private firms is that the latter are able to acquire capital from an inner circle of financiers that often have a special connection with the firm, while the former obtain funds externally from a widely scattered group of investors that does not seek a special relation with the firm. Consequently, it can be assumed, without loss of generality, that public firms will have greater incentive to reveal more information about the company to financiers (such as banks) than private firms. Therefore, the former are able to pay lower interest rates on loans than the latter. The reverse side of the process is that banks do not have the opportunity to collect greater information on public firms than the average financier, and consequently, cannot use this information to extract possible future profits. In that case, banks will make less investment in acquiring firm-specific information on public firms. As a result, public firms are likely to benefit less than private firms from banking relationships in terms of a higher probability of success in carrying out the investment project. Therefore, while public firms will possibly pay a lower lending rate, it will probably not be able to internalise the additional benefits of a relationship loan. This view has implications for the impact of monetary policy on bank borrowing by firms. If monetary policy is tightened so that banks face higher funding costs and are forced to increase lending rate, public firms are likely to be the first to switch over to the relatively cheaper non-bank financing. In contrast, privately owned firms, benefiting from bank

relationships and having less access to non-bank forms of finance, will stick longer to bank loan financing.

It is assumed that each firm is a collection of investment projects. Each project requires an investment of I . If the project is successful, it yields an output $Y > 0$ with probability θ and $Y = 0$ with probability $(1 - \theta)$. Firms pay a premium of δ_i ($i = \text{public or private}$) on top of the floor lending rate which is assumed to be R . This premium is the compensation for the services of banks offered to the firms. Since information gathering on private firms is more costly *vis-à-vis* public firm, the premium will be set higher for private firms relative to public firms. During the term of the contract, the interest rate on loans might decrease (Berger and Udell, 1995) or increase (Kaplan and Minton, 1994), which banks pass on to firms through changes in the base lending rate. It is assumed that the banking market is perfectly competitive. In other words, there exists perfect competition in supplying loans to public and private firms separately.

The primary focus of the model is on the sensitivity of the demand for bank loans to changes in interest rates. Towards this end, expected profits for various firm projects have been modeled. The expected profits of firm i [i.e., $E(P_i^F)$] from a bank-financed project are:

$$E[P_i^F] = \theta[Y - (1 + R + \delta_i)] \quad (1)$$

Likewise, the expected profits of bank i [i.e., $E(P_i^B)$] can be expressed as

$$E[P_i^B] = \theta(1 + R + \delta_i) - 1 \quad (2)$$

Assuming perfect competition (hence, $E[P_i^B] = 0$), it follows that:

$$\theta = (1 + R + \delta_i)^{-1} \quad (3)$$

The above equation illustrates that, in equilibrium, the benefits firms enjoy from bank relationships are inversely related to the interest rate premium paid. Substituting this expression into the equation of expected firm profits (1) yields expression (4). i.e. :

$$E[P_B^F] = [Y - (1 + R + \delta_i)][1 + R + \delta_i]^{-1} \quad (4)$$

This leads to the basic proposition:

Proposition: Bank financed projects of private firms are less sensitive to monetary policy shocks than bank financed projects of public firms.

Proof: The proof of the proposition is straightforward. Note that, the partial derivative of expected firm profits consequent upon a change in interest rate is given by equation (5):

$$\partial E[P_i^F] / \partial R = -Y / (1 + R + \delta_i)^2 < 0 \quad (5)$$

Since the premium (δ) of a privately-owned firm is higher than that for publicly-owned firm, equation (5) reveals that the elasticity of the profitability of bank-financed projects of the private firm is smaller in absolute value than that of the public firm.

The intuition behind this result can be stated as follows. A rise in interest rate changes the composition of projects towards high-risk ones and to that extent lowers expected firm profitability. Since the premium δ is higher for private *vis-à-vis* public firms, this would imply that the decline in expected profits for private firms is higher as compared with public firms.

3. RECEIVED LITERATURE

Academic interest in monetary issues has devoted significant attention to the different transmission channels of monetary policy. The credit channel of monetary policy advocates the twin channels: balance sheet channel and the bank-lending channel (Bernanke and Gertler, 1995). The former channel concentrates on the impact of monetary policy shocks on the strength of the firm's balance sheet, making the firm less or more collateralised when seeking external funds, The latter channel, on the other hand,

focuses on the monetary policy impact on the credit supply which filters through into the external financing premium for firms (and households).

The literature on monetary transmission has expanded rapidly in recent years. Empirical studies on this aspect can be split into several categories. The first class of models is essentially microeconomic in nature. These models seek to analyze the impact of monetary innovations in Vector Auto Regression (VAR) models (Bernanke and Blinder, 1992). These studies are couched on the notion that banks actively reshuffle their portfolio of assets following a change in the stance of monetary policy. The second class of studies analyzes firm-level investment behaviour. More particularly, the focus of these studies is to ascertain the effect of financial constraints on investment (Fazzari *et al.*, 1988). The general conclusion of this strand of literature is that small firms are typically more liquidity constrained. A third line of thinking analyzes bank behaviour in response to monetary shocks. It is likely that smaller banks, like firms, have more trouble in attracting external funds in case of a monetary contraction (Kashyap and Stein, 1997). The final strand of research analyzes the corporate financial structure along changes in monetary regimes. These studies have focused on the US economy (Kashyap *et al.*, 1993; Oliner and Rudebusch, 1996). Kashyap *et al.* (1993) empirically examine the existence of a loan supply (or a bank lending) channel of monetary policy transmission for the U.S. economy using quarterly data for the period 1963-89. Their findings suggest that tighter monetary policy tends to induce firms' to employ a convex combination of external finance wherein the issuance of commercial paper rises, while that of bank loans fall. The net effect is an overall decline in loan supply. Oliner and Rudebusch (1996), on the other hand, investigate changes in the investment behavior of small and large manufacturing firms consequent upon a change in monetary policy. In contrast to the Kashyap *et al.* (1993) study which employs aggregate data, the latter employ quarterly data on manufacturing firms covering the period 1962:1 to 1992:4 and arrive at the conclusion

that monetary tightening has differential effect on small *vis-à-vis* large firms. Specifically, for small firms, it was an observed tightening of the association between internal funds and investment after a monetary contraction. In contrast, no such association was in evidence for large firms. This would suggest a scarcity of external finance (broad credit channel) after a monetary tightening for small firms.

The present paper belongs to this last genre of thinking. In particular, the paper analyzes the impact of monetary policy on capital structure of firms with different corporate governance characteristics. With respect to corporate governance structure, international evidence has highlighted significant differences across the world (Rajan and Zingales, 1995). The choice of the corporate financial structure is dependent on the opinions with respect to governance of the suppliers of capital. This leads to the viewpoint that changes in monetary policy might have differential effect on firms in bank-based economies *vis-à-vis* market-based systems. However, studies correlating corporate financial structure with changes in monetary policy have been limited. In one of the earliest studies, Dedola and Lippi (2000) analyze four European countries and the US. They estimate the elasticities of output with respect to monetary policy indicators for various industries and employ firm-level indicators to explain the magnitude of these elasticities. The findings indicate that financial structure is important at the industry level: industries that have a greater concentration of small firms or firms with a lower leverage or industries that are more capital intensive are more likely to be significantly impacted by a monetary contraction. Industries that have relatively many firms in financial distress (measured by a large interest burden) are also more sensitive to monetary policy shocks. Using business survey data, findings for Germany have uncovered the evidence that smaller firms are more affected by monetary shocks than large firms (Ehrmann, 2000).

In the Indian context, there have been several studies on the analytics of monetary policy (Rangarajan, 1988; Reddy, 2002), on the financing pattern of corporate

houses (Cobham and Subramaniam, 1995) as well as the role of large shareholders in corporate governance (Sarkar and Sarkar, 2000) and the differential corporate governance pattern in public *versus* private banks (Jalan, 2002). However, research analyzing the interface between corporate finance, corporate governance and monetary policy has not been adequately addressed. The present paper attempts to address this shortcoming in the Indian context.

4. THE DATABASE

The database employed in the study is the publicly available *Prowess* database, generated and maintained by CMIE, the Centre for Monitoring the Indian Economy. The database is broadly akin to the *Compustat* database of US firms and is increasingly employed in the literature for firm-level analysis on Indian industry for analysis of issues like the effect of foreign ownership on the performance of Indian firms (Chibber and Majumdar, 1999), performance of firms affiliated to diversified business groups (Khanna and Palepu, 2000) and the role of large shareholders in corporate governance (Sarkar and Sarkar, 2000). The dataset contains financial information on around 8,000 companies, which are either listed (on either the Stock Exchange, Mumbai or the National Stock Exchange) as well as major unlisted public limited companies having sales exceeding Rs.10 million. In addition, an entity qualifies for inclusion in the database if the average sum of sales and total assets is more than or equal to Rs.200 million for the latest audited financial results and the entity is not listed.² There is detailed information on the financial performance of these companies culled out from their profit and loss accounts, balance sheets and stock price data. The database also contains background information, including ownership pattern, product profile, plant location and new investment projects for these companies.

² USD 1 \approx Rs.45

The selection of the sample is guided by the availability of data. From the entire database, all the firms which maintained its identity and reported its annual accounts without any gaps for the entire sample period, *viz.*, 1992 through 2002 have been selected. This has been done with a view to take into consideration all firms, whether listed or otherwise, since the inception of reforms in 1992 and in existence over the entire sample period. Screening for data consistency³ on the basis of this criterion led to the selection of a sample of 1,096 firms comprising public and private, belonging to both manufacturing and services sectors.⁴

A word is in order as regards the choice of the sample period. Until 1992, the corporate sector in India faced several constraints on its choices regarding sources of funds. Access to the equity market was regulated by the Controller of Capital Issues (CCI), an agency under the Government, which imposed stringent restrictions on corporate houses intending to raise funds through the equity route. Long-term debt was largely under the purview of state-owned development banks, which, either through direct lending or through refinancing arrangements, virtually monopolised the supply of debt finance to the corporate sector.

In the financial sector likewise, till the initiation of reforms in 1991, financial institutions had heavy restrictions on application of funds. In July 1991, for instance, commercial banks had to hold in cash reserves and government debt instruments as much as 63.5 per cent of increases in deposits. In addition, they had to extend 40 per cent of their credit to priority sectors such as agriculture, small-scale industries and housing with sub-targets for each at subsidized rates differentiated by purpose, size of loan and borrower (there were 50 such rates in 1989). Even the free portion of banks' resources was subject to 'credit norms', which set inflexible limits to loans according to sector,

³Firms that underwent merger/acquisition during this period were dropped from the sample.

⁴Banking firms, given their high degree of leveraging, were excluded from the sample.

purpose and security. The Government also regulated the use of financial instruments as well as interest rates on loans and deposits; lending rates were fixed for both priority and non-priority sectors.

In 1992, as part of the sweeping set of reforms relating to the equity market, the CCI was abolished and corporate houses have been given the freedom to access capital markets and price their securities, subject to prudential regulations of the Securities and Exchange Board of India (SEBI), the regulator of stock markets. Furthermore, Indian firms in sound financial condition have been allowed to issue equity and convertible bonds abroad. Likewise, as regards raising resources domestically through debt capital, institutional reforms have been aimed at curtailing the monopoly in supply of long-term funds by development banks, with banks being also permitted to extend long-term financing.

In the financial sector, the administered interest rate structure of banks has been rationalised. The prescriptions of rates on all term deposits, including conditions of premature withdrawal and offering uniform rate, irrespective of the size of deposits, have been dispensed with. On the lending side, lending rates have been deregulated. Likewise, the Bank Rate (the rate at which the central bank refinances commercial banks), after being dormant for several decades, has been activated as a signalling rate and simultaneously, the statutory pre-emptions on bank deposits have been gradually lowered, providing them with greater freedom in credit allocation. The removal of these twin restrictions meant that a greater role of the price mechanism (interest rate) in the resource allocation process and allowing corporates to freely raise resources from domestic capital markets, enabling a greater role of the corporate governance mechanism in company affairs.

Table 1 gives the representation of the sample. In addition, it also provides the number of firms by governance type. About 10.2 per cent of the companies in the sample

are public and the remaining are private firms. Within this broad categorization, 74 per cent of the public firms are in manufacturing and the remaining belongs to services. As regards private firms, nearly 89 per cent are in manufacturing, with 11 per cent being in services. Listed firms comprise around 63 per cent of the private firms.

[Insert Table 1 about here]

In terms of the main governance features, the minimum paid up equity capital of the firm in order to be listed should not be less than Rs. 100 million, whereas post-issue, the capitalization of the company should not be lower than Rs. 250 million, irrespective of the type of ownership. In addition, the applicant needs to satisfy certain minimum criteria as laid down in the SEBI Act, 1992 and Companies Act, 1956⁵. In addition, the company needs to provide certain critical information regarding its distribution of share holding, details of pending litigation and grievance redressal mechanism, besides submitting its audited balance sheet of three preceding years prior to year of listing. In addition, shareholders have the right to select members on the boards of directors and pressure is exerted from institutional investors to management through annual meetings.

The basic features of the sample firms and their financing pattern over the period of study are summarized in Table 2.

[Insert Table 2 about here]

Private firms, on an average, are larger than their public counterparts. Regarding the source of financing, it is observed that bank debt has been the predominant source of financing for public firms including quoted ones, whereas the situation obtaining has been markedly different for private firms, for whom reliance on bank financing was comparatively lower. This was more evident in the case of quoted private firms. However, private firms had a significant focus on working capital, although its overall

⁵Companies Act, 1956 provides a set of rules and regulations for registration of companies, irrespective of whether they are public limited or private limited companies.

short-term bank debt was more than a third lower as compared with public firms. On the uses side, it was clear that public firms tended to hold larger inventories *vis-à-vis* private ones: quoted private firms had the lowest inventory holding over this period.

5. EMPIRICAL MODEL

The main interest of the study concerns the impact of monetary policy shocks on the financing behaviour of firms and its dependence on corporate governance characteristics. Concerning the capital structure, the study focuses on four debt ratios:

- (a) total debt to total assets (DEBT),
- (b) bank debt to total assets (BKDEBT) as the main focus is on the special role of bank debt;
- (c) long-term bank loans to total assets (LTBANK),
- (d) short-term bank debt to total assets (STBANK), in order to distinguish between the differential maturity profile of short and long-term bank loans;

In addition to the above four ratios, following Peterson and Rajan (1997), the study considers the ratio of trade credit to total assets (TRADE). This variable has received a lot of attention in the literature for its substitutability with bank debt in general and, more specifically, in relation to monetary contraction.

Following previous research in this area (Oliner and Rudebusch, 1996), the estimated equation is assumed to have the following reduced form:

$$Y_{it} = \alpha X_{it} + \beta MPI_t + \gamma MPI_t * GOV_i + e_{it} \quad (6)$$

where $i=1,2,\dots,1096$ (number of firms) and $t=1,2,\dots,11$ (number of years). The panel is balanced, so that one is left with equal number of firms in each year.

In the aforesaid specification, Y_{it} denotes one of the aforementioned debt ratios of firm i in year t , X_{it} are a vector of control variables, explaining the capital structure

choices of firms; MPI is the monetary policy indicator at time t and GOV is a dummy variable for the governance type of firm.

More specifically, there are two sets of dummy variables. The first dummy (PUBLIC), takes the value 1 for public firms and 0, otherwise. The second dummy variable, labeled QUOTED, is 1 if the firm (public or private) is quoted on the stock exchange and 0, otherwise. In other words, PUBLIC focuses on the ownership features, while QUOTED captures the governance characteristics of firms. Finally, e_{it} denotes the error component.

The vector of variables \mathbf{X} is included to control for idiosyncratic effects on firm's capital structure. These are explanatory variables which are commonly employed in the literature to explain debt ratios, *viz.*, interest expenses (INT), tangible assets (TAN), intangible assets (INTANG), firm size (SIZE), depreciation (DEPCN) and earnings before interest and taxes (EARN). All these variables are expressed as ratios to total assets, except SIZE, which is the natural logarithm of total assets itself. The direct effect of monetary policy on the firm's capital structure is captured by the coefficient β , whereas the differential effects of monetary policy for particular governance type of firms are captured by γ . The interaction of the monetary policy variable with the two sets of dummy variables intends to ascertain whether monetary policy has differential effects on public versus private firms and quoted versus unquoted firms. Fully specified, equation (6) can be re-written as:

$$Y_{it} = \alpha_1 INT_{it} + \alpha_2 TAN_{it} + \alpha_3 INTANG_{it} + \alpha_4 SIZE_{it} + \alpha_5 DEPCN_{it} + \alpha_6 EARN_{it} + \beta MPI_t + \gamma_1 MPI_t * PUBLIC_i + \gamma_2 MPI_t * QUOTED_i + e_{it} \quad (7)$$

The priors with respect to the expected signs of the coefficients of the control variables can be stated as follows:

INT is the ratio of interest payments to total assets. Firms that have high interest expenses provide a signal to the market of possible financial distress. Alternately, high

interest expense could imply the presence of a large debt tax shield. Both interpretations lead to the expectation of a negative coefficient of interest expenses. Hence, the sign of the coefficient α_1 is *a priori* expected to be negative.

TAN is the ratio of tangible assets to total assets. Tangibility of assets is measured as the sum of property, plant and equipments of the firm (Kroszner and Strahan, 2001). Firms with relatively few tangible assets are likely to be more opaque to the markets (i.e., have greater informational asymmetry problems) than firms with more tangible (hence collateralizable) assets. Firms with low proportion of tangible assets should, therefore, have more difficulty obtaining external finance. This would imply a positive sign on α_2 .

INTANG is the ratio of intangible assets to total assets. A high proportion of intangible assets denote lower collateral value and hence the coefficient α_3 is expected to be negative. Intangible investments are also considered a proxy for high growth opportunities for the firm. High growth options should, according to agency theory, negatively influence the use of debt, and hence, would imply a negative sign for this coefficient.

SIZE is measured as the natural logarithm of total assets. Large firms tend to be well-diversified and better known to outside investors, so that they have fewer asymmetric information problems on the capital market and run lower business risks. Therefore, SIZE is expected to be positively related to the use of debt, i.e, the coefficient α_4 would be positive.

DEPCN is the ratio of depreciation to total assets. A high depreciation implies the presence of a large non-debt tax shield, making the use of debt tax shields relatively redundant. This would suggest a negative sign on α_5 .

EARN is the ratio of earnings before tax to total assets. The ‘pecking order’ theory of finance predicts that firms prefer internal finance over external finance, including debt. High earnings enable firms to finance their investments largely with retained earnings, so

that substantial debt finance is not necessary. Hence, the coefficient α_6 is expected to be negative.

The priors with respect to the monetary policy indicator and its governance interaction terms are as follows:

The traditional view on monetary transmission focuses on the interest rate channel. A monetary policy-induced rise in the short-term interest rate reduces both interest sensitive investment spending and the corporate demand for bank debt. However, the interest rate channel can have different implications for debt of differing maturity. It is probable that short-term debt will be reduced after a monetary policy-induced rise in short-term interest rate, but it is not so clear for long-term debt. The credit view of monetary transmission puts on stage the broad credit channel, comprising of the credit channel and the lending channel. These channels enhance the negative effects of monetary policy tightening. According to the lending channel theory, monetary policy tightening constrains the supply of bank credit, which exerts an additional negative effect for bank-dependent firms. This would suggest a negative coefficient for the monetary policy indicator, β , especially for short-term loans. For long-term loans, the expected sign on this coefficient is ambiguous.

The interaction term of the monetary policy indicator with the public firm dummy has been included to capture the possibility as to how public firms adjust their capital structure consequent upon a monetary policy shock. Public firms, being better known to outside investors *vis-à-vis* their private counterparts, are less prone to asymmetric information problems and consequently, have easier access to capital markets. The implication of this observation for the sign of the coefficient γ_1 is ambiguous. In accordance with the credit view, it is expected that public firms would be less severely impacted upon by restrictive monetary policy which would not necessarily

curtail the supply of bank credit. This would imply the coefficient γ_1 to be non-negative. On the other hand, the relationship lending view contends that it is private firms and not public firms that benefit most from building and maintaining long-term banking relationships. As a result, during conditions of monetary tightening, public firms diminish their demand for bank loans and switch to other forms of finance. In such a case, the coefficient γ_1 is expected to be negative.

The reasoning for the interaction term of the monetary policy indicator with the quotation dummy proceeds along similar lines. Quoted firms are invariably subject to stringent disclosure requirements which are necessary for being listed on the stock exchange. One might therefore expect quoted firms to be less impacted upon after a monetary tightening as compared with unquoted firms. Hence, one would expect coefficient γ_2 to be positive under the credit view hypothesis and to be negative under the relationship lending hypothesis.

Two issues deserve a mention at this juncture. The first is the choice of the monetary policy indicator. The second is the econometric estimation procedure employed in the analysis.

As regards the monetary policy indicator, the focus is on two variables. First, in line with the literature in this area, the Bank Rate (BKRT) is employed as an indicator of monetary policy (Reddy, 2000). We alternately employ the cash reserve ratio (CRR) as an alternative monetary policy indicator. It may be mentioned over the sample period, statutory pre-emption in the form of CRR have been significantly lowered from 15 per cent at end-March 1992 to 5 per cent at end-March 2002. We also consider the case where both policy shocks operate simultaneously. Evidence of such simultaneous change in the Bank Rate (price variable) and the CRR (quantity variable) is increasingly

evidenced in recent years, wherein the central bank has been found to resort to these twin measures in conjunction (RBI, various years).

Secondly, the analysis focuses primarily on the performance of individual firms. As a result, the above model was tested using panel data. However, some of the explanatory variables are likely to be endogenous, notably INT. Illustratively, a high debt ratio would engender high interest payments. Therefore, standard panel data estimators would be inefficient and therefore, an instrumental variable panel data estimator would be more appropriate. As a consequence, the two-stage least squares fixed effects estimator has been employed (Baltagi, 1995). Accordingly, the explanatory variable INT has been instrumented by all other right-hand side variables.

6. RESULTS AND DISCUSSION

Table 3 presents the correlation coefficients for the relevant variables. Several salient features that can be gleaned from the table. First, the correlation between debt ratio and all its components are positive, except for trade debt, which is, however, quite small in absolute terms. Second, trade debt is negatively correlated with overall bank debt as well as its short-term component, whereas it is positively related with long-term bank debt. This might be indicative of substitution of trade debt with other (particularly, short-term) debt. Third, debt and all its components are negatively related to most of the control variables; exceptions being tangibles and interest payments. The substitutability aspect of trade debt is borne out by the positive relationship with all control variables, except interest payments. Likewise, a monetary contraction (proxied by a rise in Bank Rate) induces firms to move out of total debt (including its sub-components) and possibly into trade debt.

[Insert Table 3 about here]

The results of the estimation process of equation (7) are presented in Table 4. The variables are discussed under four broad heads: control variables, monetary policy indicator, ownership dummy and governance dummy.

As regards the control variables, most of these are highly significant at conventional levels and have the expected signs. Thus, higher debt leads to higher interest expenses. The coefficient on TAN has the expected positive sign. Exceptions to the rule are the coefficients on INTANG, which was found to be positive for DEBT, which would suggest limited growth opportunities for firms with high intangibles. Also, SIZE was found to have a positive relationship with most debt types, except for total debt, bank debt as well as short-term bank debt, where the influence was found to be opposite. This would suggest that small-size firms make more use of these debt types. In the case of depreciation, the expected negative coefficients were observed; earnings, however, did not seem to have any influence on firm's capital structure.⁶

The main focus is on the effects of monetary policy and hence, on the coefficients of MPI and its interaction with the governance characteristics dummy variables, PUBLIC and QUOTED. From the estimated coefficients of MPI, it can be concluded that the signs of the coefficients of MPI are significant and negative in most equations, except for trade debt, wherein there is an observed positive relationship. Hence, a significant decrease in firms' debt ratios occurs after monetary policy tightening, particularly for total debt, bank debt and short-term debt. In contrast, for trade

⁶We considered an alternate case wherein the natural logarithm of sales (instead of SIZE) was employed as the control variable (Chibber and Majumdar, 1999). The results were materially unaltered in that case. We also introduced a control for AGE, where AGE was defined as the natural logarithm of the number of years since the incorporation of the firm. Majumdar (1997) had observed that in the Indian context, SIZE and AGE are key organizational determinants of firm performance. In the regression analysis, the variable AGE consistently turned out to be insignificant at conventional levels, and hence, was not included in subsequent regressions.

debt, it seems that when short-term interest rate is raised, firms rearrange their debt profile towards trade debt.

The positive coefficient on the interaction term $MPI*PUBLIC$ in the equations for bank debt and long-term bank debt would indicate that the negative monetary policy impact is smaller for public firms than for private firms. As for total debt and trade debt, this finding could be interpreted as evidence in support of the relationship lending view.

[Insert Table 4 about here]

Finally, the coefficients on the cross-term $MPI*QUOTED$ is positive and significant in most equations, while it is negative and significant with respect to long-term loans. This would suggest that after a monetary contraction, listed firms adjust their debt levels away from long-term bank loans and more towards short-term debt, which implies that their overall capital structure is more geared towards bank debt (note that the sum of long-term and short-term bank debt equals total bank debt).

The analysis was subsequently repeated with an alternate variant of monetary policy, viz., cash reserve ratio (Table 5). The general picture which emerges with respect to this monetary policy indicator is that there is a significant decrease in firms' debt ratios occurs after monetary policy tightening, particularly for total debt, bank debt and short-term debt. Trade debt is consistently observed to have a positive relationship with MPI suggesting that a monetary contraction forces firms to rearrange their debt profile in favour of trade debt.

The same findings are obtained in case of the interaction terms as well. Thus, a monetary contraction has a positive effect on bank debt and long-term bank debt, indicating that the negative monetary policy impact is smaller for public firms than for private firms when these two debt forms are considered. The negative coefficient on the trade debt equation provides strong support for the relationship lending view. Likewise, a monetary contraction engenders a shift away from long-term bank debt and towards

short-term bank debt, with an overall increase in bank debt and overall debt for listed firms. This is evidenced from the fact that the signs of the coefficients are materially unaltered with some alterations in their magnitudes in some instances.

[Insert Table 5 about here]

7. POLICY IMPLICATIONS AND CONCLUDING REMARKS

The paper addresses the response of the financing behaviour of firms to changes in monetary policy employing firm-level data on Indian firms in manufacturing and services. The primary focus of the paper is on the differential responses of public versus private firms, quoted versus non-quoted firms and manufacturing versus services firms. The sample comprises of these types of firms for the period 1992 to 2002.

The main findings of the study can be stated as follows:

First, a significant decrease in firms' debt ratios occurs after a monetary tightening. This is particularly the case for total debt, bank debt and short-term debt. In contrast, for trade debt, there was an observed increase in the debt ratio. Therefore, it seems that when short-term interest rates are raised, firms reshuffle their debt maturity away from short-term debt and towards trade debt.

Second, a split of the sample into smaller and larger firms indicates that the negative monetary policy effect on short-term bank debt is significantly higher for public firms as compared with private firms, which can be interpreted as evidence in support of the relationship lending view.

Third, another split of the sample into low and high-leveraged firms suggests that both categories of firms exhibit relationship lending, although the observed effect is stronger for low-leveraged firms. Further the results indicate that quotation does not significant impact the debt profile of most firms.

Finally, manufacturing firms are found to be relatively more responsive to monetary shock than services firms. In effect, manufacturing firms lower their short-term bank borrowings in favour of long-term borrowings in response to a monetary tightening *vis-à-vis* services firms.

These findings have important implications for policy. At the micro-theoretic level, this implies that the real effects of a monetary shock differs markedly among public *versus* private firms, quoted *versus* unquoted firms as well as manufacturing *versus* services companies. This indicates that policy authorities need to take into account not only the differential ownership characteristics and the corporate governance features of the firm, but also the nature of economic activity that the firm pursues. Since manufacturing firms tend to be more interest sensitive than those in services, a monetary policy shock impinges much more on the former *vis-à-vis* the latter. From the macro standpoint, economists have long debated the relative merits and de-merits of bank-based *versus* market-based systems (Van Damme, 1994). While the comparative advantages of one *vis-à-vis* the other are as yet unresolved (Levine, 2002), recent research has observed that industries that are heavy users of external capital grow faster in countries with higher overall levels of financial development. In other words, merely whether a system is bank-based or market-based does not bear any relationship with the efficiency of capital allocation. This would suggest that as countries achieve higher levels of financial development and rely more on external finance, it is important that policy makers remove the constraints on intermediation rather than tilt the playing field in favour of banks or markets.

References

- Baltagi, B. (1995). *Econometric Analysis of Panel Data*, John Wiley and Sons: New York.
- Berger, A.N. and Udell, G.F. (1995). Lines of Credit and Relationship Lending to Small Firm Finance. *Journal of Business*, 68 (3), 351-381.
- Bernanke, B.S. and Blinder, A. (1992). The Federal Funds Rate and the Channels of Monetary Transmission. *American Economic Review*, 82 (4), 901-921.
- Bernanke, B.S. and Gertler, M. (1995). Inside the Black Box: The Credit Channel of Monetary Policy Transmission. *Journal of Economic Perspectives*, 9 (1), 27-48.
- Centre for Monitoring of Indian Economy. *Prowess* (Release 2.1), CMIE: Mumbai.
- Chibber, P.K and Majumdar, S.K. (1999). Foreign Ownership and Profitability: Property Rights, Control, and the Performance of Firms in Indian Industry. *Journal of Law and Economics*. 42 (1), 209-238.
- Cobham, D and Subramaniam, R. (1998). Corporate Finance in Developing Countries: New Evidence for India. *World Development*. 26 (6), 1033-1047.
- de Haan, L and Sterken, E. (2000). Capital Structure and Corporate Governance: Evidence from Euro Area. De Nederlands Bank (*mimeo*).
- Dedola, L and Lippi, F. (2000). The Monetary Transmission Mechanism: Evidence from the Industries of Five OECD Countries. Bank of Italy (*mimeo*).
- Ehrmann, M. (2000). Firm Size and Monetary Policy Transmission: Evidence from German Business Survey Data. *European Central Bank Working Paper* No.21: Frankfurt.
- Fazzari, S.M., Hubbard, R.G. and Petersen, B.C. (1988). Financing Constraints and Corporate Investment. *Brookings Paper on Economic Activity*. 1(1), 141-195.
- Jalan, B. (2002). Corporate Governance and Financial Sector: Some Issues. *Inaugural Address at NIBM Annual Day*. NIBM: Pune.
- Jensen, M and Meckling, W. (1976). Theory of the Firm: Managerial Behaviour, Agency Costs and Ownership Structure. *Journal of Financial Economics*. 3 (4), 305-360.
- Kaplan, S.N. and Minton, B.A. (1994). Appointments of Outsiders to Japanese Board: Determinants and Implications for Managers. *Journal of Financial Economics*. 36 (2), 225-258.
- Kashyap, A.K., Stein, J.C. and Wilcox, D.W. (1993). Monetary Policy and Credit Conditions: Evidence from the Composition of External Finance. *American Economic Review*. 83 (1), 73-98.

- Kashyap, A.K, Stein, J.C. and Wilcox, D.W. (1996). Monetary Policy and Credit Conditions: Evidence from the Composition of External Finance: Reply. *American Economic Review*. 86 (2), 310-314.
- Kashyap, A.K and Stein, J.C. (1997). What do a Million Banks have to say about the Transmission of Monetary Policy? NBER Working Paper 6056. National Bureau of Economic Research, Cambridge, Mass.
- Khanna, T and Palepu, K. (2000). Is Group Affiliation Profitable in Emerging Markets: An Analysis of Diversified Indian Business Groups?. *Journal of Finance*. 55 (2), 867-891.
- Kroszner, R.S. and Strahan, P.E. (2001). Bankers on Boards: Monitoring, Conflicts of Interests and Lender Liability. *Journal of Financial Economics*. 62 (3), 415-452.
- Levine, R (2002). Bank-based or Market-based Financial Systems: Which is Better? *Journal of Financial Intermediation*. 11 (4), 398-428.
- Majumdar, S.K (1997). The Impact of Size and Age on Firm-Level Performance: Some Evidence from Indian Industry. *Review of Industrial Organisation*. 12 (2), 231-241.
- Myers, S.C. and Majluf, N. (1984). Corporate Financing and Investment Decisions when Firms Have Information Investors Do Not Have. *Journal of Financial Economics*. 13 (1), 187-221.
- Oliner, S.D. and Rudebusch, G.D. (1996). Is There a Broad Credit Channel for Monetary Policy? *Federal Reserve Bank of San Francisco Economic Review*. 1(1): 4-13.
- Petersen, M.A. and Rajan, R.G. (1997). Trade Credit: Theories and Evidence. *Review of Financial Studies*. 10 (5), 661-691.
- Rajan, R.G. and Zingales, L. (1995). What Do We Know about Capital Structure? Some Evidence from International Data. *Journal of Finance*. 50 (6), 1421-1460.
- Rangarajan, C. (1988). Issues in Monetary Management. *Presidential Address at the 71 st Conference of Indian Economic Association: Delhi*.
- Reddy, Y.V. (2002). Parameters of Monetary Policy in India. *Lecture Delivered at the 88 th Annual Conference of Indian Econometric Society*. Chennai.
- Reserve Bank of India, *Statement on Monetary and Credit Policy* (various years).
- Sarkar, J and Sarkar, S. (2000). Large Shareholder Activism in Corporate Governance in Developing Countries: Evidence from India. *International Review of Finance*. 1 (2), 161-194.
- Van Damme, E. (1994). Banking: A Survey of Recent Microeconomic Theory. *Oxford Review of Economic Policy*. 10 (4), 14-33.

Table 1: Break-up of Sample Firms by Ownership and Industry Type, 1992-2002 (numbers)

Firm type	Public	<i>Of which</i> Listed	Private	<i>Of which</i> Listed	Total	<i>Of which</i> Listed
Manufacturing	83	36	884	557	967	593
Services	29	12	100	87	129	99
Total	112	48	994	644	1096	692

Source: Compiled from *Prowess* database

Table 2: External Financing Pattern by Governance Type:
Aggregate Averages for 1992-2002 (per cent to respective total)

	Public	<i>Of which</i> Quoted	Private	<i>Of which</i> Quoted
Paid-up Capital	10.02	10.00	31.46	40.57
Long-term debt	8.09	8.11	5.22	1.87
Short-term debt	52.33	52.44	13.13	6.87
<i>Of which</i>				
Working Capital	10.61	10.50	24.42	21.03
Other Current Liabilities	9.35	9.34	23.86	29.66
Trade Credit	9.60	9.62	1.92	0.00
<i>Memo</i>				
Bank Debt	60.43	60.55	18.35	8.75

Source: Authors' calculation

Table 3: Correlation Matrix Among the Variables

Variable	DEBT	BANK	LTBANK	STBANK	TRADE
DEBT	1.000				
BANK	0.298	1.000			
LTBANK	0.152	0.778	1.000		
STBANK	0.295	0.681	0.069	1.000	
TRADE	-0.026	-0.010	0.082	-0.111	1.000
INT	0.479	0.681	0.706	0.259	-0.037
TAN	0.205	0.089	0.049	0.085	0.008
INTANG	-0.008	-0.011	-0.002	-0.015	0.004
SIZE	-0.120	-0.161	-0.042	-0.207	0.056
DEPCN	-0.013	-0.040	-0.008	-0.054	0.005
EARN	-0.041	-0.057	-0.016	-0.072	0.009
MPI	-0.042	-0.037	-0.027	-0.026	0.036

MPI is proxied by Bank Rate.

Table 4: 2SLS Within Sample Estimation for the Whole Sample

Variables	DEBT _{it}	BANK _{it}	LTBANK _{it}	STBANK _{it}	TRADE _{it}
<i>Control Variables</i>					
INT _{it}	1.333 (0.00)	0.301 (0.00)	0.294 (0.00)	0.007 (0.21)	-0.036 (0.00)
TAN _{it}	0.705 (0.00)	0.093 (0.00)	0.004 (0.49)	0.090 (0.00)	0.010 (0.04)
INTANG _{it}	0.188 (0.05)	0.0006 (0.97)	-0.003 (0.79)	0.003 (0.82)	-0.002 (0.85)
SIZE _{it}	-16.476 (0.00)	-0.358 (0.02)	1.478 (0.00)	-1.836 (0.00)	2.756 (0.00)
DEPCN _{it}	-0.059 (0.01)	0.004 (0.27)	0.002 (0.44)	0.002 (0.56)	0.0002 (0.93)
EARN _{it}	-0.003 (0.68)	-0.0008 (0.47)	0.0004 (0.58)	-0.001 (0.24)	-0.0007 (0.34)
<i>Monetary Policy Indicator</i>					
MPI _t	-2.753 (0.00)	-0.237 (0.00)	0.066 (0.30)	-0.303 (0.00)	0.400 (0.00)
<i>Ownership Dummy</i>					
MPI _t *PUBLIC	-13.152 (0.00)	0.883 (0.00)	1.037 (0.00)	-0.155 (0.39)	-0.428 (0.00)
<i>Governance Dummy</i>					
MPI _t *QUOTED	2.668 (0.00)	0.118 (0.29)	-0.149 (0.06)	0.267 (0.01)	0.136 (0.08)
Constant	101.879 (0.00)	11.674 (0.00)	-6.652 (0.00)	18.327 (0.00)	-16.558 (0.00)
<i>Diagnostics</i>					
R ²	0.080	0.383	0.381	0.028	0.005
No. of Observations	11555	11555	11555	11555	11555
No of Firms	1096	1096	1096	1096	1096

p-values in brackets. MPI is proxied by Bank Rate

Table 5: 2SLS Within Sample Estimation for the Whole Sample

Variables	DEBT _{it}	BANK _{it}	LTBANK _{it}	STBANK _{it}	TRADE _{it}
<i>Control Variables</i>					
INT _{it}	1.332 (0.00)	0.300 (0.00)	0.294 (0.00)	0.006 (0.29)	-0.035 (0.00)
TAN _{it}	0.694 (0.00)	0.093 (0.00)	0.006 (0.23)	0.086 (0.00)	0.013 (0.01)
INTANG _{it}	0.184 (0.06)	0.001 (0.93)	-0.004 (0.75)	0.005 (0.74)	-0.002 (0.86)
SIZE _{it}	-18.035 (0.00)	-0.536 (0.09)	1.629 (0.00)	-2.166 (0.00)	3.164 (0.00)
DEPCN _{it}	-0.057 (0.02)	0.003 (0.36)	0.002 (0.40)	0.001 (0.73)	0.0004 (0.87)
EARN _{it}	-0.004 (0.59)	-0.0008 (0.49)	0.0006 (0.48)	-0.001 (0.20)	-0.0007 (0.36)
<i>Monetary Policy Indicator</i>					
MPI _t	-2.202 (0.00)	-0.158 (0.02)	0.107 (0.03)	-0.265 (0.00)	0.299 (0.00)
<i>Ownership Dummy</i>					
MPI _t *PUBLIC _t	-9.386 (0.00)	0.537 (0.00)	0.840 (0.00)	-0.303 (0.02)	-0.292 (0.00)
<i>Governance Dummy</i>					
MPI _t *QUOTED _t	1.734 (0.00)	0.016 (0.85)	-0.136 (0.02)	0.152 (0.025)	0.194 (0.00)
Constant	108.749 (0.00)	12.818 (0.00)	-7.959 (0.00)	20.777 (0.00)	-18.515 (0.00)
<i>Diagnostics</i>					
R ²	0.102	0.410	0.384	0.035	0.005
No. of Observations	11555	11555	11555	11555	11555
No of Firms	1096	1096	1096	1096	1096

p-values in brackets. MPI is proxied by cash reserve ratio (CRR)