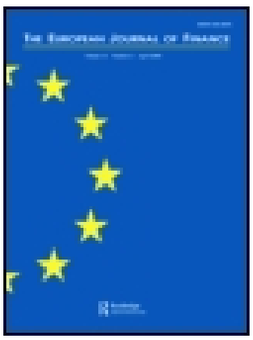

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How successful are banking sector reforms in emerging market economies? Evidence from impact of monetary policy on levels and structures of firm debt in India

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Many emerging markets have undertaken significant financial sector reforms, especially in their banking sectors, that are critical for both financial development and real economic activity. In this paper, we investigate the success of banking reforms in India where significant banking reforms were implemented during the 1990s. Using the argument that well-functioning credit markets would reflect a credit channel for monetary policy at work, we test whether a change in monetary policy has a predictable impact on borrowing behaviour of several types of firms, including business group affiliated, unaffiliated private firms, state-owned firms and foreign firms. The empirical results suggest that unaffiliated private firms have the most vulnerable to monetary policy stance during tight policy regimes. We also find that during tight monetary policy regimes, bank credit of smaller firms is more sensitive to changes in the interest rate than that of large firms. In an easy money regime, monetary policy and the associated change in interest rate does not affect change in bank credit, change in total debt and the proportion of bank credit in total debt for any of the firms. We discuss the policy implications of the findings.

Keywords: banking reforms; monetary policy; credit markets; bank debt; debt structure

JEL codes: E52; G21; G28; G32; O16

1. Introduction

The correlation – some would argue causal relation – between financial development and economic growth is well established, albeit with some caveats (King and Levine 1993; Demetriades and Hussein 1996; Arestis and Demetriades 1997). Not surprisingly, over the past three decades, a large number of developing countries (including their fast-growing subset, emerging market economies) have undertaken reforms of their financial sector. While some of these reforms have been aimed at reducing transactions cost and improving informational efficiency of equity markets (Lagoarde-Segot 2009), much of the reforms were aimed at the banking sectors of these countries that have been the central pillars of their financial systems for decades (Abiad, Detragiache, and Tressel 2010; Ağca and Celasun 2012). At the same time, for a variety of reasons, corporate bond markets have remained underdeveloped in all but a handful – Brazil, China and Malaysia – of emerging market economies (Tendulkar 2015; Burger, Warnock, and Warnock 2015).

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Banking sector reforms in these countries were largely aimed at reducing or eliminating the constraints imposed on banks by interest rate controls, directed credit and pre-emption of savings by the government, policies that are generally associated with financial repression (Fry 1997). Simultaneously, banks were accorded greater responsibility with respect to management of credit risk, by way of prudential norms involving recognition of loan losses and maintenance of adequate risk capital. Incumbent banks were also subjected to greater competition by way of liberalisation of the rules and regulations about entry of new foreign and domestic banks. The details of these changes to the banking landscape in emerging market economies have been discussed widely in the literature, in the context of countries such as China (Lardy 2008), India (Bhaumik and Dimova 2004; Bhaumik and Piesse 2008), South Korea (Amsden and Euh 1993), former communist economies of Soviet Union (Love and Rachinsky 2015; Cojocaru et al. 2016) and Turkey (Akyuz 1990).

However, the economic reforms directed at the financial sectors of emerging market economies are often incomplete, and significant market frictions remained. To begin with, the informational cost in these countries remains high, as the corporate landscape continues to be dominated by firms that had opaque ownership structures and entrenched management (Khanna and Palepu 2000; Claessens and Fan 2002). The cost of contract enforcement remains high as well, and in some cases the problem is further aggravated by weak or inadequate bankruptcy laws (Kang and Nayar 2004). These characteristics of the credit market favour incumbent firms that have proven track record and banking relationships (Banerjee, Cole, and Duflo 2004), those that are able to post collateral or implicit and explicit guarantees of established firms within business networks (Fisman and Wang 2010), and those with political connections (Khwaja and Mian 2005; Tsai et al. 2016; Zhang et al. 2015). This does not mean, however, that banks in these countries do not employ commercial judgement about credit allocation (Firth et al. 2009), and the credit market frictions that favour incumbents and organisations such as business groups can be ameliorated over time (Bhaumik, Das, and Kumbhakar 2012). However, not enough is understood about the functioning of credit (more broadly, financial) markets as the different aspects of the reforms packages pull the market participants in different directions.

In this paper, we draw implications about the success of banking sector reforms in emerging market economies using the prism of monetary policy transmission in these economies. Monetary theory suggests that informational frictions in credit markets worsen during tight money periods (Bernanke and Gertler 1995), and this may have implications for both bank debt and overall debt exposure of firms (Huang 2003). If banking reforms reduce overall informational cost in the credit market, enhance the capacity and willingness of banks to better evaluate credit applications, and make it easier to enforce credit contracts, then monetary policy should affect the debt exposure of all types of firms similarly. However, if the threat of adverse selection remains acute and enforcement of credit contracts remains difficult then firm that is better able to signal their quality or have their liabilities underwritten (e.g. large firms or older firms or business group affiliated firms) may be less affected by monetary policy than their counterparts who do not have these abilities. By examining the impact of monetary policy on debt exposures of different types of firms within the same institutional and regulatory context, therefore, we are able to draw conclusions about the effectiveness of banking sector reforms in an emerging market context.

For our empirical analysis, we choose the context of India where there was a significant and well-documented progress in banking sector reforms from the early to the late nineties. In keeping with the literature, we distinguish between easy and tight monetary regimes, the assumption being that the impact of interest rate changes on volume and structure of debt is higher during

tight money regimes than in the easy money regimes. Our results suggest that unaffiliated private firms have the most vulnerable to monetary policy stance during tight policy regimes where other types of firms are relatively less affected by changes in monetary policy. We also find that during tight monetary policy regimes, smaller firms are more affected by monetary policy than larger firms; volume of bank loans of smaller firms is more sensitive to interest rate changes than that of larger firms. Our results suggest that information costs and agency issues that were highlighted by extant research (e.g. Banerjee, Cole, and Duflo 2004) have not been completely ameliorated by banking sector reforms. They also have implications for complementary issues such as low-cost bankruptcy proceedings and creditors' rights that are only now being addressed by the government. Our results, therefore, have implications for emerging market economies that embark on banking sector reforms. They also have implications for developed country contexts, such as Europe, that have experienced a rise in credit market frictions and where central banks are simultaneously pursuing unorthodox monetary policy, at least in part to support private sector investment and economic growth.

The rest of the paper is structured as follows: our empirical strategy is discussed in Section 2. In Section 3, we discuss the context of analysis. The data and the summary statistics are discussed in Section 4, and the regression results and their implications are discussed in Section 5. Section 6 concludes.

2. Empirical strategy

Our empirical strategy is based on the argument that if credit markets work well then a change in monetary policy should have a predictable impact on the borrowing patterns of firms.[1] Specifically, a tightening of monetary policy should result in a reduction in the volume of total debt on the balance sheet of an average firm (Bernanke and Gertler 1995; Oliner and Rudebusch 1996), especially if bank loans that are the dominant source of finance in most economies, and emerging markets in particular, cannot easily be substituted by other forms of debt. Further, this is more likely to be the case during tight money regimes than during easy money regimes (Bhaumik, Dang, and Kutan 2011), where the easiness or tightness of a monetary regime is indicated by an indicator such as the monetary condition index (Osborne-Kinch and Holton 2010). The impact is likely to be greater for smaller and younger firms that are often informationally less transparent than their larger counterparts (Berger and Udell 1998, 2006). Finally, as the cost of bank finance rises in the event of monetary tightening, relative to cost of capital from other sources, there should be an impact of a firm's debt structure, as captured by the ratio of bank debt to total debt (Huang 2003).

However, these general propositions would have to be refined for developing country and emerging market contexts. For example, given that firms in these countries are largely dependent on bank capital and have significantly underdeveloped bond markets (Bose and Coondoo 2003), such that change in overall debt is largely driven by change in bank debt, the impact of monetary policy on a firm's debt structure may be weak or insignificant. Similarly, the impact of monetary policy on bank loan itself is likely to be more significant for firms that are unaffiliated to governments and organisational structures such as business groups. For example, state-owned firms (and those with strong relations with the state) may be subjected to soft budget constraints whereby liabilities are effectively written off by the state, if necessary (Kornai 1986; Megginson, Ullah, and Wei 2014). They may also have preferential access to loans in these economies, especially where the banking sector is dominated by state-owned banks (Girma, Gong, and Gorg 2008). By the same token, business group affiliated firms can (but are not guaranteed to) benefit

from a commitment to mutually insuring related firms within the same business group against financial difficulties (Chang and Hong 2000; Friedman, Johnson, and Mitton 2003; Khanna and Yafeh 2005), which can enhance their credit worthiness.

In other words, in developing economy and emerging market contexts, it would be prudent to focus on the impact of monetary policy on these unaffiliated firms, and contrast this impact with the impact of monetary policy on business group affiliated and state-owned firms. If banking sector reforms result in a level playing field and reduction in frictions in the credit market then there should be no observable difference between the impact of monetary policy on growth in bank credit and debt structure of unaffiliated firms and those of the firms in the aforementioned comparator groups. Continued presence of frictions, on the other hand, would result in a greater impact of monetary policy on unaffiliated firms than on business group affiliated and state-owned firms. Similarly, following Berger and Udell (1998, 2006), and accounting for a host of factors such as absence of credit registers, weak bankruptcy laws and weak credit protection, in general, we should expect monetary policy to have a greater impact on smaller (younger) firms than on larger (older) firms. Following Bhaumik, Dang, and Kutan (2011), this impact is likely to be greater during periods of tight monetary policy than during periods of easy monetary policy.

In order to operationalise the empirical framework, following Huang (2003), we propose that a representative firm faces a choice between bank credit and bond finance, and that this choice is affected by the relative price of debt from these two sources. The firm's choice function, therefore, is given by

$$\min\ C = r_B B + r_N N - f(B/D)D \text{ subject to } B + N = D$$

where C is the cost of borrowing, $r_B B$ and $r_N N$ are interest payment on bank debt and non-bank debt (or bonds),[2] and f is a (concave) function that captures the benefits of relationship banking associated with bank borrowing that can partly offset the cost of bank loans. It is easy to see that, within this framework, monetary policy affects the spread between the cost of bank and non-bank debt, and thereby affects both the stock of these two sources of debt and the structure of the firm's debt, namely, the proportion of bank debt in total debt. As mentioned above, the impact of monetary policy is likely to be greater during tight money periods.

Huang (2003) argues that, in particular, the impact of monetary policy on bank debt, total debt and debt structure of firms can be estimated using the following regression models:

$$BD_{i,t} = \alpha_0 + \alpha_1 BD_{i,t-1} + \alpha_2 \Delta F_t T + \alpha_3 \Delta F_t (1 - T) + \Omega' X + \mu_t + \vartheta_i + \epsilon_{i,t} \quad (1)$$

$$\Delta B_{i,t} = \gamma_0 + \gamma_1 \Delta B_{i,t-1} + \gamma_2 \Delta F_t T + \gamma_3 \Delta F_t (1 - T) + \Psi' X + \mu_t + \vartheta_i + \epsilon_{i,t} \quad (2)$$

$$\Delta D_{i,t} = \beta_0 + \beta_1 \Delta D_{i,t-1} + \beta_2 \Delta F_t T + \beta_3 \Delta F_t (1 - T) + \Phi' X + \mu_t + \vartheta_i + \epsilon_{i,t} \quad (3)$$

where BD is the ratio of bank debt to total debt, B is the logarithm of the stock of bank debt, D is the logarithm of the stock of total debt, F is the logarithm of the interest rate indicator of monetary policy, T is a binary indicator of tight monetary conditions and correspondingly $(1 - T)$ is a binary indicator of easy monetary conditions, X is a vector of other firm characteristics that can affect a firm's debt structure and levels of total and bank debt themselves. The indicator T is created using the monetary conditioning index for the context of analysis.[3] Depending on the regression model, X includes logarithm of inventory (N) and logarithm of gearing (G) which is measured by the debt-to-asset ratio. Finally, μ and ϑ are time and firm fixed effects, respectively, and ϵ is the *iid* error term.

Given the dynamic nature of the equations, these equations have to be estimated using variation of the generalised method of moments (GMM) approach proposed by Arellano and Bover (1995) and Blundell and Bond (1998). We estimate these models for different ownership categories, firm sizes and firm age. Based on our prior discussion, we propose that if banking sector reforms do not eliminate or significantly reduce credit market frictions, such that problems of adverse selection and contract enforceability are still significant, then monetary policy will affect (bank and non-bank) debt and debt structure of different types of firms differently. Specifically, those firms that are less capable of signaling credit worthiness, or are viewed as higher credit risk, would experience a greater change in their debt levels and debt structure than their counterparts. Given the context of analysis, this would enable us to draw some conclusions about whether a given set of policies aimed at reforming the banking sector are sufficient and, if they are not, speculate about the types of additional policies/reforms that might be necessary.

3. Context of analysis

The modern history of Indian banking arguably starts in 1969, when the Government of India nationalised the banks, in part as a response to a spate of bank failures, and in part to usher in an era of social banking that could facilitate economic development. The banks operated within an environment of financial repression characterised by administered interest rates, mandatory loan syndication, and pre-emption of their deposit base by the government in the form of measures such as high statutory liquidity ratio (SLR) that required banks to invest a significant proportion of their resources in government and quasi-government bonds (Sen and Vaidya 1998). At the same time, the thrust on social banking led to a large-scale expansion of the banking network in India, with the nationalised banks adding over 55,000 branches between 1969 and 1990.

However, while the social agenda of the bank may have been a success, the Indian banking sector in the early 1990s was in distress. While the gross operating profit of scheduled commercial banks rose from 0.8 per cent (of assets) in the 1970s to about 1.5 per cent in the 1990s, net profit of the banks had declined sharply. There was also serious concern about accumulation of non-performing assets (NPAs), especially among the state-owned banks that accounted for about 88 per cent of the assets of the banking sector. Further, the pro-market reforms initiated by the government in 1991 were incompatible with the financial repression that characterised the banking sector. Hence, the Reserve Bank of India (RBI) initiated banking sector reforms in 1992, based on the recommendations of Narasimham Committee I.

The reforms had three main pillars (Sarkar, Sarkar, and Bhaumik 1998; Bhaumik and Dimova 2004; Bhaumik and Piesse 2008). First, the banking sector was subjected to greater competition. Incumbent private and foreign-owned banks were allowed to expand their branching network and new banks were permitted to enter the market. Second, banks were granted much greater autonomy over disbursal of credit and the pricing of credit. The cash reserve ratio (CRR) and the SLR were reduced sharply between 1992 and 1997, from 15 per cent to 10 per cent, and from 38.5 per cent to 25 per cent, respectively. By 1993, the loan threshold above which syndication was mandatory was raised from INR 50 million to INR 500 million, and by 1997 most quantitative restrictions related to mandatory syndication and disbursal of term loans were removed. By 1998, banks were free to determine the lending rates of all loans, with the understanding that lending rates of loans of up to INR 200,000 would not exceed the declared prime lending rate (PLR) of banks. Finally, banks were subjected to prudential regulations that were modelled on the recommendations of the Basle committee. Specifically, banks were required to maintain

appropriate levels of risk-weighted capital, recognise bad loans early, in accordance with the norms laid down by the RBI, and write off NPAs.

In 1998, the RBI initiated the second generation of banking reforms, in keeping with the recommendations of Narasimham Committee II. The most important recommendation of the Committee was the creation of asset reconstruction companies (ARCs) to simultaneously improve the quality of the balance sheets of the banks and to facilitate recovery of loans. In a separate development, after a prolonged period of legal disputes, debt recovery tribunals (DRTs) began functioning in India, in earnest, by 1999. In other words, the RBI was attempting to simultaneously strengthen the balance sheets of the banks and to put in place institutions that would add to the capability of banks to implement the debt contracts that lie at the very heart of the process of financial intermediation and delegated monitoring.

In many ways, the reforms were having the expected impact on the Indian banking sector. The Indian banking sector witnessed the entry of new private banks such as Axis Bank and HDFC Bank, and there was an expansion of the branch network of both private and foreign banks. As a consequence, there was a noticeable decline in the market share of state-owned banks over time and unsurprisingly this was accompanied by greater competition (Zhao, Casu, and Ferrari 2010). This, in turn, led to technological progress driven productivity growth in the Indian banking sector, albeit at a greater rate for foreign banks than for their domestic counterparts (Casu, Ferrari, and Zhao 2013). Reforms related to DRTs also had the desired impact on loan repayment likelihood (Visaria 2009). However, the evidence about credit allocation is less encouraging. Bhaumik and Piesse (2008) found that in large measure bank-level credit disbursal in India is explained by past allocation of credit. This is consistent with contract level evidence, albeit from a single large state-owned bank, that suggests that loans were still being made on the basis of past loan sizes rather than on the basis of potential (Banerjee, Cole, and Duflo 2004). In part, this conservativeness can be explained by factors such as expected political cost of bad loans, or by low managerial ability to identify good lending opportunities (even though information that have recently come to light about the extent of bad loans in the Indian banking sector suggests that we should discount the former argument significantly[4]). But alternative, and equally plausible, arguments include persistent high information cost, and the risks associated with lending to firms with entrenched management (which has negative implications for governance quality), especially in a context where bankruptcy cost is high (Kang and Nayar 2004).[5] In such an environment, state-owned firms that have close relationship with the still dominant state-owned banks and organisational forms such as business groups that are optimised to operate efficiently in contexts of missing markets and weak formal institutions may have an advantage over standalone private firms, even though the credit market advantage of the business groups may have declined over time (Bhaumik, Das, and Kumbhakar 2012).

The suitability of the Indian context for our empirical exercise is easy to see. On the one hand, greater autonomy of the dominant state-owned banks and greater competition in the banking sector and existence of a large number of privately owned firms suggests that the credit channel of monetary policy transmission might be operating in a way that is consistent with theoretical propositions. There is some empirical support for this line of argument (Bhaumik, Dang, and Kutan 2011). At the same time, the corporate landscape is characterised by firms with a wide range of ownership, size and age, and there is some evidence to suggest that some of these firms might have easier access to credit than others. Finally, the Indian central bank, the RBI, has been active in the monetary policy sphere, thereby impacting the cost of bank credit. Hence, our empirical strategy is meaningful in the Indian context.

4. Data and summary statistics

4.1 *Firm-level data*

The firm-level data have been obtained from the Prowess database marketed by Centre for Monitoring the Indian Economy (CMIE), which is widely used for firm-level analysis in the Indian context (Gopalan, Nanda, and Seru 2007; Bhaumik and Selarka 2012). The database includes data reported in financial statements, including detailed breakdown of sources of bank and non-bank credit. It also includes information about firm characteristics such as inventory and gearing, i.e. the variables included in Equations (1)–(3), and ownership information such as business group affiliation and state ownership. It also provides information on industry affiliation of firms.

Further, the data are available for a fairly long time series, thereby facilitating panel analysis. We focus, in particular, on the 2001–2006 period. As discussed earlier in this paper, the major reforms initiatives in the Indian banking context were initiated during the 1990s. Hence, the impact of reforms on the credit market should have become apparent by 2001. At the other end of the time line, 2006 is the last year for which we have estimates of the monetary conditioning index for India which facilitates the choice between tight and easy money regimes. This, however, is not very restrictive, given that 2008 is anyhow a watershed year for the global financial system beyond which it is difficult to distinguish between the impact of pervasive uncertainty and weak recovery of the global economy from the factors discussed in the previous section.

After accounting for missing information in the firm-level data, we are left with an unbalanced panel of 1347 business group affiliated firms, 3273 unaffiliated private firms, 178 state-owned firms (including a handful of joint ventures (JVs) between state-owned firms and private firms) and 238 foreign firms. Over the sample period, they account for 5121, 10,282, 618 and 843 firm-years, respectively. The rationale for combining JVs involving state-owned firms is that in emerging market economies with large state-owned banking sectors partnership with the government should provide privileged access to credit, close to or at par with state-owned firms.

4.2 *Monetary policy and monetary regime*

As mentioned above, the monetary policy authority in India is RBI, the central bank. The RBI was established under the Reserve Bank of India Act of 1934, as a private shareholders' bank, and was nationalised in 1949, after India's independence. From the outset, the RBI did not have de jure independence from the government of India, and this was largely manifested through the automatic monetisation of ad hoc treasury bills. As pointed out by Reddy (1999), this problem was particularly acute during the 1980s when '[t]he process of creating 91-day ad hoc Treasury bills and subsequently funding them into non-marketable special securities at a very low interest rate emerged as the principal source of monetary expansion' (100). This process undermined the stated principle of effective control of the monetary base that was enshrined in the high-profile Chakravarty Committee Report.[6]

However, under an agreement between the government and the RBI, the automatic monetisation process was stopped from 1 April 1997, and while the central bank continued to lack de jure independence during the sample period, this gave the RBI greater control over monetary policy. Specifically, as noted by Bhattacharya (2006), it has been argued that while the RBI has to strike a balance between price stability and growth, the political economy tilts the balance in favour of price stability such that the central bank has an 'informal' mandate to maintain an acceptable level of inflation. Specifically, '[t]he institutional arrangement . . . . represented a

reasonable degree of statutory autonomy in the case of India – at least within the group of developing countries whose overall policy framework yielded little operational independence to their central banks' (Bhattacharya 2006, 77).

In the post-agreement period, the RBI has used a number of different policy instruments to signal its monetary policy stance. The CRR, which came down steadily from 15 per cent in the early 1990s to 5 per cent by 2004, was more useful for direct monetary targeting and hence less useful in the post-agreement period. However, its use was not completely abandoned during the sample period. Since 1998, the central bank has signaled its monetary policy stance using short-term interest rates, in particular, the repo and reverse repo rates. As demonstrated by Bhaumik, Dang, and Kutan (2011), while this makes it difficult to use a specific indicator of monetary policy in the Indian context, the co-movement of the average PLRs of the five largest banks makes it a reasonable indicator of monetary policy. We, therefore, use this average PLR to compute *F*, the (logarithm of) interest rate indicator of monetary policy. We also use the indictor of tight and easy money regimes used by Bhaumik, Dang, and Kutan (2011), which is based on the monetary conditioning index for India estimated by Kannan, Sanyal, and Bhoi (2006).[7]

4.3 *Summary statistics*

Summary statistics on credit and capital market access of the firms are reported in Table 1. The information reported in the table suggests the following:

a. India has a bank-based financial system, with banks accounting for roughly half the credit obtained by business group affiliated firms, unaffiliated firms and foreign firms. Indeed, only about 9–13 per cent of business group affiliated firms, state-owned firms and foreign firms, and only about 3 per cent of unaffiliated firms have access to capital/bond markets. This is consistent with the evidence that highlights the persistence of the underdeveloped status of the Indian corporate bond market (Bose and Coondoo 2003; Khanna and Varottil 2012).
b. There is a fairly significant market for inter-corporate lending. Indeed, firms of all ownership types borrow (nearly) as much from subsidiaries and corporate bodies, in percentage terms, as from non-bank financial institutions. For example, even unaffiliated private firms that are not part of business group internal capital markets borrow 8.71 per cent from subsidiaries and corporate bodies, and a comparable 9.09 per cent from non-bank financial institutions.
c. Contrary to popular wisdom, state-owned firms do not obtain the majority of their credit from the (largely state-owned) banking system. Bank credit accounts for only 31.53 per cent of the credit that they obtain. Much of their credit is obtained directly from the government (25.99 per cent) or from subsidiaries and corporate bodies (18.44 per cent) whose ownership cannot be identified from the data but those that are likely to be other state-owned firms.
d. While state-owned firms and foreign firms are able to obtain unsecured credit relatively easily – nearly half or more of the credit obtained by these firms is unsecured, collateralised credit accounts for about 70 per cent of the credit obtained by the vast majority of the firms, whether business group affiliated or unaffiliated. Bank credit accounts for 71–93 per cent of this collaterised debt. Since collateral is meant to be a signal to overcome adverse selection problems (Bester 1985, 1987), this suggests that the Indian credit market is characterised by significant adverse selection, perhaps, in part, because of opacity of firms with concentrated ownership and organisational structures such as business groups (Claessens and Fan 2002; Bhaumik and Dimova 2014).[8]

e. Finally, despite progressive liberalisation/convertibility of the capital account of balance of payments, a very small proportion of the firms access overseas credit and capital markets. Indeed, even for foreign firms, which have nearly double the proportion of foreign currency debt compared to their nearest domestic competitors (8.33 per cent vs. 4.29 per cent), the business group affiliated firms, foreign current debt account less than a tenth of total debt.[9]

The above statistics about external financing of the firms in our sample have implications for our empirical analysis. The strong *prima facie* evidence for adverse selection in the Indian credit market suggests that monetary policy may have a significant impact on disbursal of bank credit, especially during periods of tight monetary regimes. Given that state-owned banks evidently have a safety net in the form of government borrowing, and given that the inter-corporate credit market is much more reliable for business group affiliated firms than for unaffiliated firms, the aforementioned impact of monetary policy is likely to be greater for unaffiliated firms than for their business group affiliated and state-owned domestic competitors. However, while the numbers reported in Table 1 have implications for bank credit, they do not tell us much about overall corporate debt, nor about the proportion of bank credit in total debt, which remains an open empirical question.

In Table 2, we report the summary statistics of the variables we use for the regression analysis. We report these statistics for all the firms in our sample, and separately for the business group affiliated and private independent firms that are dominant in our sample, accounting for 91.33 per cent of the firm-year observations. Further, we report the statistics separately for the easy money regime and tight money regime. The figures reported in this table suggest that, for the sample period in question, the interest rate declined, on average, during both the easy and tight money regimes. Correspondingly, there was an increase in bank loans for the firms in both these monetary regimes, but the magnitude of this increase was different for business group affiliated and private independent firms. There is also a difference in the change in the ratio of bank loans

Table 1. Sources of credit.

	Business group affiliated	Unaffiliated private firms	State-owned firms (including JVs)	Foreign firms
Proportion borrowed from bank (%)	50.77	58.07	31.53	48.49
Proportion borrowed from financial institutions (%)	11.39	9.09	5.67	5.44
Proportion of borrowing that is secured (%)	69.67	71.58	43.43	53.19
Proportion of secured borrowing that is from banks (%)	93.72	71.58	91.53	80.64
Proportion of borrowing from subsidiaries and other corporate bodies (%)	12.09	8.71	18.44	12.01
Proportion of borrowing from governments (%)	1.06	0.78	25.99	2.11
Proportion of foreign currency debt (%)	4.29	2.46	2.73	8.33
Proportion of firms with access to capital markets (%)	13.59	2.96	9.30	9.43

Table 2. Descriptive statistics.

	Easy money regime			Tight money regime		
	All firms	Business group affiliated	Unaffiliated private	All firms	Business group affiliated	Unaffiliated private
$(B/D)_t$	0.089	0.055	0.115	0.008	– 0.014	0.029
	(0.622)	(0.646)	(0.568)	(0.485)	(0.479)	(0.445)
ΔB_t	0.108	0.077	0.137	0.034	0.028	0.064
	(0.895)	(0.947)	(0.818)	(0.756)	(0.736)	(0.667)
ΔN_t	0.092	0.084	0.096	– 0.022	– 0.018	– 0.022
	(0.529)	(0.502)	(0.555)	(0.505)	(0.419)	(0.564)
ΔG_t	– 0.011	– 0.025	0.002	– 0.051	– 0.070	– 0.034
	(0.579)	(0.599)	(0.526)	(0.467)	(0.460)	(0.427)
ΔF_t	– 0.025	– 0.026	– 0.025	– 0.026	– 0.026	– 0.025
	(0.015)	(0.015)	(0.015)	(0.044)	(0.044)	(0.044)

Note: The table reports the means and (within parentheses) the standard deviations of the variables used in our analysis (Equations (1)–(3)), for the relevant sample of firms – all, business group affiliated and unaffiliated private, for the easy and tight money regimes.

to total loans of these two types of firms, in both the easy and tight money regimes. While these figures do not tell us conclusively how monetary policy affects bank debt and the ratio of bank debt to total debt, nor whether the impact of monetary policy differs between the easy and tight money regimes, they do provide *prima facie* evidence of a relationship between a change in interest rate and the aforementioned debt-related variables. These figures also suggest that it would be meaningful to examine this relationship separately for firms with different ownerships, which lies at the heart of our empirical strategy.

5. Regression results

At the outset, we considered the use of panel unit root test for the data. The restrictive assumptions made by the stylised panel unit root tests and the low power of these tests have been widely discussed in the literature (e.g. Karlsson and Lothgren 2000; Choi 2001; Strauss and Yigit 2003). Further, given a sample period of six years, which is further reduced on account of differencing and use of a lagged dependent variable, any test for panel unit roots is not meaningful. Our perusal of the finance literature suggests that the use of panel unit root tests is not stylised (e.g. Huang 2003; Hennessy 2004; Brown, Fazzari, and Petersen 2009; Wintoki, Linck, and Netter 2012). Hence, we proceeded to the estimation of the regression models without testing for panel unit roots.[10]

To begin with, we estimate Equations (1)–(3) for the dominant business group affiliated and private independent firms, without any interaction between the monetary policy variable and the easy and tight money regimes. Since these are baseline regressions, we report the coefficient of only the monetary policy variable in Table 3. Consistent with our observation in Table 2, a change in interest rate is seen to be inversely related to the change in bank debt and total debt of independent private firms, but not for business group affiliated firms. There is no impact of a change in interest rate on the ratio of bank debt to total debt of either type of firms. More importantly, however, since interest rate declined, and bank and total debt increased, on average, for both types of firms, in both the easy and tight money regimes, it is not obvious as to whether the result is driven by the firm-year observations in the easy or the tight money years in the sample.

Table 3. Baseline regressions (without monetary policy regime interaction).

	$(B/D)_t$		ΔB_t		ΔD_t	
	Business group affiliated	Unaffiliated private firms	Business group affiliated	Unaffiliated private firms	Business group affiliated	Unaffiliated private firms
ΔF_t	− 0.44	− 0.66	− 1.99	− 7.54**	2.48	− 7.13***
	(0.66)	(0.45)	(2.76)	(3.00)	(3.10)	(2.54)

Note: The baseline regression specification did not include the interactions between T and $(1 - T)$ with ΔF_t. The models were estimated using system GMM. In almost all cases, the conditions related to AR(2) and the Hansen J statistic were met. The full regression results are available upon request. The values within parentheses are robust standard errors. ** and *** indicate significance at the 5 per cent and 1 per cent levels, respectively.

The baseline regression, however, reinforces two of our priors, namely, that monetary policy has an impact on firm debt in at least one of the monetary regimes, and that there may be differences in the impact of monetary policy on firm debt (and perhaps also debt structure) of firms with different ownership. We, therefore, proceed with our empirical strategy which differentiates

Table 4. Impact of monetary policy on debt structure.

	Dependent variable: Ratio of bank debt to total debt $(B/D)t$			
	Business group affiliated	Unaffiliated private firms	State-owned firms (including JV)	Foreign firms
$(B/D)_{t-1}$	0.97***	0.98***	1.05***	1.01***
	(0.03)	(0.02)	(0.07)	(0.08)
ΔN_t	0.03***	0.02***	0.004	− 0.007
	(0.01)	(0.007)	(0.03)	(0.04)
ΔG_t	0.04**	0.04***	0.003	0.04
	(0.02)	(0.01)	(0.03)	(0.03)
$\Delta F_t \times$ Easy money	− 1.63	− 1.25	0.57	0.92
	(0.99)	(0.79)	(1.41)	(2.12)
$\Delta F_t \times$ Tight money	− 0.03	− 0.39	0.11	0.34
	(0.73)	(0.45)	(0.47)	(1.90)
AR(2)	0.60	0.96	0.65	1.95*
(Prob > z)	(0.54)	(0.33)	(0.51)	(0.052)
Hansen statistic	22.97	23.04	16.59	17.22
(Prob > chi-sq)	(0.23)	(0.23)	(0.61)	(0.57)
Difference-in-Hansen				
GMM instruments	10.80	11.27	9.54	7.91
(Prob > ch-sq)	(0.21)	(0.18)	(0.29)	(0.44)
IV	1.00	1.01	0.76	3.16
(Prob > chi-sq)	(0.60)	(0.60)	(0.68)	(0.20)
Wald chi-sq	34751.08	90618.79	2679.11	3139.66
(Prob > chi-sq)	(0.00)	(0.00)	(0.00)	(0.00)
Number of firms	1347	3273	178	238
Number of obs.	5121	10282	618	843

Note: The values within parentheses are robust standard errors. *, ** and *** indicate significance at the 10 per cent, 5 per cent and 1 per cent levels, respectively.

Table 5. Impact of monetary policy on volume of bank loans.

	Dependent variable: Change in volume of bank loans, ΔB_t			
	Business group affiliated	Unaffiliated private firms	State-owned firms (including JV)	Foreign firms
ΔB_{t-1}	0.10	− 0.19	− 0.61***	− 0.44
	(0.20)	(0.18)	(0.16)	(0.48)
ΔN_t	0.35***	0.24***	− 0.47	0.18
	(0.09)	(0.03)	(0.35)	(0.45)
BD_{t-1}	0.17	0.19	− 0.46	− 0.36
	(0.19)	(0.13)	(0.49)	(0.56)
$\Delta F_t \times$ Easy money	2.29	− 1.39	− 9.81	− 1.02
	(4.51)	(3.77)	(9.21)	(13.14)
$\Delta F_t \times$ Tight money	− 10.66 *	− 19.21 ***	− 13.92	23.59
	(5.89)	(4.49)	(15.52)	(29.58)
AR(2)	0.84	− 0.14	− 2.01	0.09
(Prob > z)	(0.40)	(0.89)	(0.04)	(0.92)
Hansen statistic	12.94	7.93	7.93	5.10
(Prob > chi-sq)	(0.07)	(0.34)	(0.34)	(0.65)
Difference-in-Hansen				
GMM instruments(Prob > ch-sq)	10.78	5.47	1.54	2.78
	(0.03)	(0.24)	(0.81)	(0.59)
IV	3.08	1.49	4.88	1.75
(Prob > chi-sq)	(0.21)	(0.47)	(0.09)	(0.41)
Wald chi-sq	53.67	177.72	51.83	10.72
(Prob > chi-sq)	(0.00)	(0.00)	(0.00)	(0.05)
Number of firms	1060	2247	118	161
Number of obs.	3314	6073	337	419

Note: The values within parentheses are robust standard errors. *, ** and *** indicate significance at the 10 per cent, 5 per cent and 1 per cent levels, respectively.

between impact of monetary policy in easy and tight money regimes, and also estimates the aforementioned equations separately for firms of all ownership types.

The regression results are reported in Tables 4–7. In Tables 4, 5 and 6, we report the estimates for Equations (1)–(3). In each of these tables, we report the estimates separately for the four different ownership types in our sample. In Table 7, we explore further the impact of monetary policy on unaffiliated firms that are most likely to be affected by such policy. Specifically, we compare the relative impact on larger (those bigger than median) and smaller (those smaller than median) firms, and older (pre-1990) and younger (post-1990) firms. Finally, for each table and the regression models therein, we report the test statistics for the null hypotheses involving AR(2) and the appropriateness of the GMM instruments (Hansen *J* statistic). The null hypothesis regarding AR(2) is rejected only for foreign firms in Table 2, and the null hypothesis for the Hansen statistic is not rejected at the 5 per cent level for any of the regression models in any of the tables.[11] We also report the difference-in-Hansen statistics for the main regression results (Tables 4–6), and in almost all cases the null hypothesis that the specified variables are proper instruments could not be rejected. This gives us confidence about the validity of our instruments and hence about the regression estimates reported in the tables.

Let us first focus on the impact of monetary policy, and focus on the domestic firms which are more reliant on the domestic credit market than the foreign firms. In Tables 4–6, in an easy

Table 6. Impact of monetary policy on volume of total debt.

	Dependent variable: Change in volume of total debt, ΔD_t			
	Business group affiliated	Unaffiliated private firms	State-owned firms (including JV)	Foreign firms
ΔD_{t-1}	− 0.11	− 0.05	− 0.10	− 0.84
	(0.15)	(0.20)	(0.37)	(0.56)
ΔN_t	0.20***	0.20***	0.23**	− 0.01
	(0.06)	(0.03)	(0.11)	(0.23)
BD_{t-1}	0.24	0.09	− 0.04	− 0.15
	(0.18)	(0.11)	(0.31)	(0.59)
ΔF_t × Easy money	4.33	− 2.49	0.82	2.84
	(3.85)	(2.84)	(4.64)	(11.60)
ΔF_t × Tight money	− 6.65	− 16.64***	− 0.66	11.91
	(11.26)	(4.14)	(5.11)	(19.18)
AR(2)	− 0.70	0.38	1.22	− 0.70
(Prob > z)	(0.48)	(0.71)	(0.22)	(0.48)
Hansen statistic	3.53	4.20	5.10	1.21
(Prob > chi-sq)	(0.83)	(0.75)	(0.65)	(0.87)
Difference-in-Hansen				
GMM instruments	1.26	2.56	2.77	1.21
(Prob > ch-sq)	(0.86)	(0.63)	(0.59)	(0.87)
IV	0.70	2.06	0.44	0.38
(Prob > chi-sq)	(0.70)	(0.35)	(0.80)	(0.82)
Wald chi-sq	43.72	185.99	4.98	12.20
(Prob > chi-sq)	(0.00)	(0.00)	(0.41)	(0.03)
Number of firms	1176	2494	147	202
Number of obs.	3713	6832	433	596

Note: The values within parentheses are robust standard errors. *, ** and *** indicate significance at the 10 per cent, 5 per cent and 1 per cent levels, respectively.

money regime, monetary policy and the associated change in interest rate does not affect change in bank credit, change in total debt and the proportion of bank credit in total debt for any of the firms. This is consistent with the results in Bhaumik, Dang, and Kutan (2011) which suggest that over the same period bank lending in India was, by and large, unaffected by monetary policy, in an easy money regime. Monetary policy does have an impact on change in bank credit and total debt during a tight money regime – a rise in interest rates leads to a reduction in both bank credit (Table 5) and total debt (Table 6), proportion of bank credit in total debt is unaffected (Table 4) – but only for the unaffiliated private firms. As discussed earlier in the paper, this is perhaps to be expected; unaffiliated (or independent) private firms that do not have the benefit of mutual insurance of business groups and state support enjoyed by state-owned firms are more likely to be affected by monetary policy. It also suggests that despite the decline in the efficiency of business group structures in reducing financial constraints since the turn of the century (Bhaumik, Das, and Kumbhakar 2012), mechanisms such as internal capital markets (more broadly, inter-corporate networks in credit markets) were still relevant in the Indian context.

In Table 7, we focus on the unaffiliated private firms that seem to be most vulnerable to monetary policy initiatives during tight money regimes, with attendant implications for their access to bank (and non-bank) credit relative to their business group affiliated and state-owned domestic counterparts. Specifically, we focus on age and size which, following Berger and Udell (1998,

Table 7. Impact of monetary policy on volume of bank loans – unaffiliated private companies.

	Dependent variable: Change in volume of bank loans, ΔB_t			
	Differentiated by size		**Differentiated by age**	
	Larger firms	Smaller firms	Pre-1990 firms	Post-1990 firms
ΔB_{t-1}	− 0.07	− 0.49	− 0.02	− 0.30
	(0.14)	(0.41)	(0.22)	(0.25)
ΔN_t	0.24***	0.25***	0.27***	0.24***
	(0.04)	(0.06)	(0.04)	(0.05)
BD_{t-1}	0.16	0.32	0.25*	0.19
	(0.12)	(0.36)	(0.15)	(0.20)
$\Delta F_t \times$ Easy money	− 3.25	6.46	3.13	− 4.22
	(3.63)	(12.12)	(3.95)	(6.04)
$\Delta F_t \times$ Tight money	− 17.42***	− 23.71***	− 12.32***	− 13.38**
	(4.72)	(8.37)	(3.69)	(6.67)
AR(2)	0.30	− 0.86	0.37	− 0.60
(Prob > z)	(0.764)	(0.38)	(0.71)	(0.55)
Hansen statistic	7.61	14.06	8.73	7.37
(Prob > chi-sq)	(0.37)	(0.05)	(0.27)	(0.39)
Number of firms	1403	844	1467	780
Number of obs.	4109	1964	4118	1955

Note: The values within parentheses are robust standard errors. *, ** and *** indicate significance at the 10 per cent, 5 per cent and 1 per cent levels, respectively.

2006), are reasonable proxies for information cost associated with firms. The results suggest that during tight money regimes, smaller firms (coefficient of − 23.71) are much more affected by monetary policy (i.e. interest rate changes) than large firms (coefficient of − 17.42). This is consistent with the popular and policy concern about smaller firms finding it more difficult to access bank credit than larger firms. However, there is no significant difference in the impact of monetary policy on changes in bank credit of pre-1990 and post-1990 firms (coefficients of − 12.32 vs − 13.38).[12]

The coefficient estimates for the other variables have the expected signs. In Tables 4 and 5, an increase in inventory holdings is associated with an increase in bank debt and bank loans for business group affiliated and unaffiliated private firms but not for state-owned and foreign firms, while in Table 6, we observe that higher inventories raise total debt for all firms except foreign firms. In Tables 5 and 6, bank debt last period has no predictive power for bank loans or total debt. Regarding lagged dependent variables, we see significant persistency in bank debt ratio in Table 4, while no persistency in Tables 5 and 6 for volumes of bank debt and total debt. Interestingly, in Table 5, we observe significant persistency only for the state-owned firms; a high volume of bank loan on the balance sheet of the average state-owned firm in the previous period is associated with a decline in the volume of bank loans in the current period.

6. Conclusion and policy implications

Given the widespread evidence about correlation (even causality) between banking sector development and economic growth, it is not surprising that many emerging market economies are advised to undertake suitable banking sector reforms, and indeed many of them such as India

have ushered in a wide set of reforms over a period of time. However, while there is a large literature on the impact of these reforms on performance of banks, often distinguishing between banks of different ownership, there is considerably less understanding of the impact of these reforms on the process of financial intermediation. In this paper, we examine the impact of banking sector reforms on financial intermediation using the prism of monetary policy transmission. We argue that if banking sector reforms remove frictions in the credit market, this should be reflected in the credit channel of transmission of monetary policy. In particular, monetary policy should not affect firms of different ownership types – some of which are better capable of functioning in markets with frictions while others are not – differently, nor should it have significantly different effects on firms at different points of age and size distributions.

We examine these propositions in the Indian context which is characterised by both significant banking sector reforms and existence of different types of firms, some of which have advantages over others with respect to mitigating credit market frictions. Our empirical results suggest, in an easy money regime, that monetary policy and the associated change in interest rate do not affect change in bank credit, change in total debt and the proportion of bank credit in total debt for any of the firms. This is consistent with extant literature on the credit channel transmission of monetary policy in India (Bhaumik, Dang, and Kutan 2011). However, in a tight policy regime, private firms that neither have state backing nor are affiliated with business groups are most affected by monetary policy, in comparison with other types of firms. We also find that during tight monetary policy regimes, smaller firms are more affected by monetary policy than larger firms; the volume of bank loans of the former is more sensitive to changes in the interest rate.

Our empirical results have two important policy implications. First, there is some evidence of a credit channel for monetary policy at work, especially when taken together with related evidence in the literature (e.g. Bhaumik, Dang and Kutan 2011), suggesting some success of banking sector reforms in India. In other words, greater competition, greater autonomy with respect to loan disbursal and pricing of loans, subjecting banks to prudential norms, and establishing mechanisms for contract enforcement are all reforms worth exploring in emerging market contexts. Second, banking sector reforms alone are clearly not sufficient to mitigate credit market frictions that give some kinds of firms (such as those affiliated to business groups or the state) an advantage over others, an advantage that can lead to misallocation of credit. To overcome the residual frictions, governments may have to supplement banking sector reforms with wider reforms with respect to bankruptcy laws and corporate governance, thereby eschewing the silo-based approach to banking sector reforms.

Our results have implications not only for emerging market economies but also for developed contexts such as Europe. Since the onset of the sovereign debt crisis and the associated banking crisis in the Euro area, the European Central Bank has pursued expansionary monetary policy. While the objective of this policy is, in part, to provide liquidity to the banking system and thereby stave off a systemic crisis, in part it is also a policy reaction to the weak growth fundamentals in the Euro area. However, data available from the FRED database of the Federal Reserve Bank of St Louis suggest that, with the exception of a couple of quarters of 2014–2015, the growth of credit to the private non-financial sector (adjusted for breaks) has been muted. The frictions in the credit channel of transmission of monetary policy within the Euro area have been highlighted in policy publications of organisations like the OECD (2015). This could be on account of a number of factors such as accumulation of NPAs on the balance sheets of banks, excessive leverage on the balance sheets of firms, and inability of some firms (SMEs in particular) to signal their credit worthiness. Our results provide insight into how transmission of monetary policy can be affected by the aforementioned frictions, and thereby contribute to the

policy debate about the efficacy of persisting with unorthodox monetary policy in the years to come.

As with all research, however, ours has its own limitation. In large measure, this limitation is similar to the one that is applicable to much of empirical research, especially those about emerging market economies that experience a large number of policy initiatives and reforms within a relatively short period of time. Since these initiatives and reforms can concurrently impact behaviour of financial and non-financial firms, it is difficult to isolate the impact of individual policy initiatives/reforms and thereby estimate the marginal impact of these initiatives/reforms. In the future, therefore, it would be interesting to see whether introduction of (isolated but) complementary policy changes/reforms to bankruptcy law etc. have the expected or desired impact on emerging market banking sectors. Specifically, one can then ask the question as to whether these isolated, and hence easily identifiable, policy events improve the transmission of monetary policy through the credit markets. Events such as the introduction of the new bankruptcy law in India can be used as natural experiments for such empirical investigations.

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Notes

1. As argued by Bernanke and Gertler (1995), 'monetary policy affects not only the general level of interest rates, but also the size of the external finance premium' (35), and two different mechanisms link monetary policy and the size of this premium. On the one hand, contractionary monetary policy can reduce the loanable funds available with banks, especially if bank deposits cannot easily be replaced by alternative instruments such as certificates of deposit. Consequently, the importance of efficiently distributing available loanable funds increases considerably and, at the same time, changes to the interest rate affect the likelihood of adverse selection. On the other hand, during periods of contractionary monetary policy, the borrowers experience rising interest rate cost and declining value of collateral, given the inverse relationship between interest rates and value of a wide range of assets. While both these mechanisms suggest that credit flows and, by extension, the volume of bank debt on the balance sheets of firms are affected by monetary policy, it is difficult to distinguish between the impact of the two channels on credit disbursal and firm borrowing. In the words of Bernanke and Gertler (1995), 'we are more confident in the existence of a credit channel in general than we are in our ability to distinguish between the two mechanisms of the credit channel' (42).
2. Correspondingly, B is bank debt, N is non-bank debt (or bonds) and D is total debt.
3. Bhaumik, Dang, and Kutan (2011) provide the following explanation as to why it is necessary to separately identify the monetary policy stance of the central bank and the monetary policy regime within which the policy is implemented:

> a given change in interest rates cannot have the same impact in a tight and easy monetary regime; a 50 basis point increase in the interest is likely to have a different impact on loan distribution when the initial value of the interest rate is (say) 8%, compared to the case when the initial value of the interest rate is (say) 2% (2422).

4. See, for example, *Bad bank loans undermine India's growth hopes* (*Financial Times*, February 18, 2016). Questions are also being raised about the prudence of lending large sums of money to highly leveraged companies such as Kingfisher Airlines.
5. A new bankruptcy law was passed by the Indian Parliament in 2016, but its enforcement may take time and its efficiency is as-yet untested. See, for example, *What India's new bankruptcy law means* (*The Wall Street Journal*, May 12, 2016).
6. Formally, this was known as the *Report of the Committee to Review the Working of the Monetary System*, and it was submitted to the RBI in 1985.
7. There is a well-established literature on the monetary conditioning index, and it is fairly technical. Since the estimation of the index is not the focus of this paper, we abstract from a detailed discussion of this index. The details can be found in the references cited in our paper.
8. The weak bankruptcy regime that makes liquidation of borrowers' assets costly in the event of a default possibly matters as well; see Kang and Nayar (2004) for a discussion of India's bankruptcy regime. However, the bankruptcy regime possibly matters less than the adverse selection problem posed by informational asymmetry (Haselmann, Pistor, and Vig 2010). Further, the introduction of debt recovery tribunals, which evidently had a positive impact on credit disbursal by banks (Visaria 2009), partly ameliorated the problems associated with the costly bankruptcy regime, while problems associated with informational asymmetry and firm opacity were more likely to have persisted.
9. For a discussion of the challenges associated with cross-listing by emerging market firms in overseas capital markets, see Temouri, Driffield, and Bhaumik (2016).
10. We are also mindful about the issue of correlation among explanatory variables included in the model specification. However, it is stylised in the finance literature to develop model specifications on the basis of theory and the use of correlation matrices and variance inflation factors (VIFs) to identify multicollinearity issues is not stylised. Further, our explanatory variables are largely indicators of monetary policy and monetary regime that are, by definition, exogenous to the firms and are also uncorrelated to firm-level variables. We have not, therefore, checked for multicollinearity before proceeding with the estimation of the models.
11. The Sargan statistic, which is often reported, is not valid in the presence of conditional heteroskedasticity, and the Sargan statistic that is robust to heteroskedasticity is numerically equivalent to Hansen's *J* statistic (Baum, Schaffer, and Stillman 2003). Hence, for both the one-step robust estimation and all two-step estimations, it is reasonable to report the Hansen *J* statistic, which is consistent in the presence of arbitrary intra-cluster correlation. While the Hansen statistic itself can be weakened by instrument proliferation, our choice of two lags, firm age and a time trend by construction limits instrument proliferation. As in many cases of econometric modelling, after considering the pros and cons of alternative test statistics, we report the Hansen statistic. This is consistent with other papers within the broad area of economics and finance (e.g., Mullahy 1997; Fisman and Svensson 2007; Li and Zhang 2007; Cawley and Meyerhoefer 2012).
12. This is apparently at odds with Banerjee, Cole, and Duflo's (2004) finding that there is persistent in bank lending, such that newer firms with greater growth opportunities may find it difficult to obtain bank credit, while incumbent firms that do not have as many opportunities to grow may continue to have access to bank credit. Note, however, that Banerjee, Cole, and Duflo's (2004) empirical analysis is limited by virtue of its use of a single bank's data. Further, given that the firms listed in the Prowess database are generally larger and stock exchange listed, they do not necessarily capture the experiences of small and medium enterprises (SMEs) that are included in data obtained from banks.

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