# Monetary policy and informal finance: Is there a pecking order?

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## I.Introduction

A significant volume of literature has evolved in recent years that examine the impact of monetary policy. At the macroeconomic level, these studies employ time series techniques to identify the effect of monetary shock on output and inflation (Gertler and Karadi, 2014). At the microeconomic level, researchers have utilized longitudinal data and focused on the impact of monetary policy on banks (Altunbas et al., 2014), firms (Mizen and Yalcin, 2006) and more broadly, on financial markets (Gali and Gambetti, 2014). A common thread permeating these studies is that monetary policy exerts a non-negligible impact on both real and financial variables.

However, one area that has largely escaped the attention of researchers is the impact of monetary policy on informal finance. To the extent that monetary policy influences the cost of funds in the formal financial sector, it appears likely that its influence would also reverberate to the informal financial sector. Whether any such impact manifests itself in emerging economies has not been systematically explored in prior empirical research.

Towards this end, we employ decadal data on major Indian states during 1961-2011 to examine the impact of monetary policy on informal finance. Combining information on the proportion of households accessing finance from various non-institutional sources with indicators on economic, financial and social variables, we identify a non-linear impact of monetary policy on informal finance. Economically, it is possible to discern several channels through which monetary policy can affect informal finance. First, *the broad credit channel* argues that if the share of small-scale manufacturing is high, the more likely would be the efficacy of monetary policy owing to information asymmetries that plague small firms. A strict creditworthiness criterion adopted during monetary contraction could alienate prospective informal sector borrowers with inadequate collateral backing, necessitating higher dependence on informal finance. Second, *the financial inclusion channel*. Provided the outreach of formal finance is high, the less likely the need to take recourse to informal finance. This is because the cost of formal finance is typically much lower as compared to the cost of

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informal finance, even after taking on board the rise in the cost of formal finance consequent upon a monetary contraction (World Bank, 2009). Third, *the human capital channel*. A more literate population implies greater awareness about the possible pitfalls of greater dependence on informal finance, lowering the dependence on such finance. And finally, *the uncertainty channel*. Greater uncertainty (e.g., due to inflation volatility) would engender higher precautionary demand for cash, especially if inflationary expectations are not well-anchored. In such a situation, a contractionary monetary policy further exacerbates the uncertainty, and more so for informal sector borrowers with uneven cash flows, further increasing the dependence on informal finance. We construct proxies for each of these channels and understand their impact on informal finance.

The rest of the paper proceeds as follows. Section II provides an overview of the admittedly limited literature in this field. The subsequent section describes the data and empirical strategy. The results are discussed in Section IV. The final section concludes and raises certain policy concerns.

## II. Literature

The extant literature of the impact of monetary policy on the informal financial sector is limited. Theoretical contributions have explored the relationship between the informal and formal credit markets. Within a game theoretic setup, Gupta and Chaudhuri (1997) analyze the interplay between formal and informal credit markets and finds that a market for informal credit exists either because the supply of formal finance is inadequate or because it is not available when needed most. Madestam (2009) extends the analysis by assuming two types of informal lenders – those who lend from their own equity and those who access formal finance - in order to onlend to informal sector. They find that additional informal finance increases the investment of bank-rationed borrowers by channeling bank funds into informal lending.

Several studies examine this issue within an empirical setup. In an early attempt, Carpenter (1999) focuses on the relationship between informal lending and monetary policy. Utilizing a Vector Autoregression framework for South Korea, the analysis uncovers evidence that directed credit extended by the central bank (a proxy for monetary policy) exerts a significant effect on the interest rate in the informal sector.

Subsequent research has expanded on this framework using sophisticated techniques. By way of example, using a dynamic stochastic general equilibrium (DSGE) model, Ngalawa and VIegi (2013) find that interest rates in the formal and informal financial sectors tend to move in opposite directions, following a monetary shock. More recently, employing survey data for a leading Chinese city with a significant informal sector presence, Qin et al (2014) suggests that informal lending rates

exhibit a significant response to national monetary policy. A possible implication of these studies is that the relation between monetary policy and informal finance is not unambiguous.

In the Indian case, several studies have investigated the link between formal and informal finance. Early studies (Acharya and Madhur, 1983; Sundaram and Pandit, 1984) explored the interlinkage between commercial bank credit and informal interest rate. The major concern of these studies was whether the black money in the economy impedes the monetary transmission process. Subsequent research employs data from All-India Debt and Investment Survey (AIDIS) and documents that the increase in the penetration of formal finance during 1961-81 was modest, at best (Basu, 2005). Recent empirical research suggests that the interest cost in informal credit markets are much more favorable for rich borrowers who have better bargaining power (Bhattacharjee and Rajeev, 2010).

The fact that informal financing plays a significant role in shaping household consumption is evidenced from the recent AIDIS (Government of India, 2014). The data indicates that the share of informal financing sources in 2012 was close to half of total households borrowings as compared to 43% in 2002. A disaggregated analysis reveals a compositional shift with the recent increase being driven by a rise in the share of credit from relatives and money lenders, whereas the share of landlords declined (Table 1).

Table 1: Share of informal financing sources (per cent)

| | **1961** | **1971** | **1981** | **1991** | **2002** | **2012** |
|---|---|---|---|---|---|---|
| Landlords | 0.9 | 8.6 | 4.1 | 4.0 | 1.0 | 0.8 |
| Moneylenders | 60.8 | 36.9 | 16.9 | 15.7 | 29.6 | 28.6 |
| Traders & commission agents | 7.7 | 8.7 | 3.6 | 7.1 | 2.6 | 0.2 |
| Relatives and friends | 6.9 | 13.8 | 9.3 | 6.7 | 7.1 | 16.2 |
| Others | 8.9 | 2.8 | 4.9 | 2.5 | 2.6 | 2.4 |
| Total non-institutional | 85.2 | 70.8 | 38.8 | 36.0 | 42.9 | 48.1 |

Source: AIDIS (various years)

The contribution of this paper is three-fold. First, notwithstanding the penetration of formal finance, the proportion of households' with borrowings from informal sources in India has not declined substantially since the 1980s (Mohan, 2005). Indeed, as the recently released AIDIS (Government of India, 2014) would suggest, the proportion of informal (or, non-institutional) finance has actually increased, after witnessing a dip during 1981-1991. Whether monetary policy plays a role in influencing this process is one of the major concerns of the paper. Second, borrowing from the literature on regional economies in India, we identify several channels through which monetary policy influences informal finance by constructing proxies for those channels. Third, India is one of the very few economies for whom reliable time-series information on informal financial sector at the state-level is available. The longitudinal nature of this database makes it amenable to rigorous empirical research.

## III. Database and empirical strategy

*Database*

We construct a dataset of the relevant variables for 14 major states, including observations every ten years such as 1961-62, 1971-72, 1981-82, 1991-92 and 2001-02 and 2011-12.[2] The benefit of employing decadal data is two-fold. First, it enables to understand the impact of monetary policy on the informal financial sector over an elongated time span wherein the various forces shaping its evolution are likely to have played themselves out. Second, consistent data on several state-level variables, particularly for informal finance, is available only at decadal intervals.

We rely on several data sources. The major data source is the All India Debt and Investment Surveys (AIDIS). A crucial feature of the AIDIS is data on household debt by credit agency (formal and informal). According to the AIDIS, the agency from which a loan is taken treated as the credit agency. The credit agencies are either institutional or non-institutional (or, informal) in nature. The former includes government, banks, insurance, provident fund and financial corporations. More pertinent for our purpose is the latter which includes landlords, money lenders, trader, relatives and a residual catch-all category, labeled 'others'. From this database, we cull out information on the proportion of household indebted to various non-institutional sources, as indicated earlier.

Besides, we also employ several other data sources, such as the EPW States database (for data on sectoral shares and net state domestic product, NSDP), *Handbook of State Finances* of the Reserve Bank of India, *Basic Statistical Returns* (which provides state-level information on credit), Economic Survey and the Handbook of Statistics on Indian Economy (HBS) of the Reserve Bank of India, which provides information on the monetary policy rate (Table 2).[3]

2 These states are: Andhra Pradesh (AP), Karnataka (KAR), Kerala (KER) and Tamil Nadu (TN) in Southern region, Haryana (HAR), Punjab (PUN), Rajasthan (RAJ) and Uttar Pradesh (UP) in the Northern region, Bihar (BH), Odisha (ORS), and West Bengal (WB) in the Eastern region and Gujarat (GUJ) Maharashtra (MAH) and Madhya Pradesh (MP) in the Western region.

[3] Data on policy rate for the years prior to 1992 is culled from the Chartbook on Financial and Economic Indicators (CFE) of the Reserve Bank of India (1978).

Table 2: Variable definition and summary statistics

| Variable | Definition | Data source |
|---|---|---|
| Total | Informal finance/Total (formal+informal) finance | AIDIS, various years |
| Landlords | Informal finance by landlords/Informal finance (IF) | AIDIS, various years |
| Moneylenders | Informal finance by moneylenders/ IF | AIDIS, various years |
| Traders | Informal finance by traders/ IF | AIDIS, various years |
| Relatives | informal finance by relatives etc/ IF | AIDIS, various years |
| Others | Informal finance by others /IF | AIDIS, various years |
| MYP | Policy rate, proxied by the Repo Rate | Handbook of Statistics/ Chartbook of Financial Indicators |
| Sh_unreg | Unregistered manufacturing/ NSDP | EPW Research Foundation (EPWRF)/ RBI |
| Credit/NSDP | Bank credit/ NSDP | Numerator is from RBI |
| Bank office | Bank office/100,000 | Numerator is from RBI. Denominator is from EPWRF |
| Volatility | Decadal standard deviation of state-wise GDP deflator (proxy for uncertainty) | EPWRF/ RBI |
| Government | Government expenditure/NSDP | RBI State finance database |
| Literacy | Ln (state-level literacy) | Economic Survey |
| GDPGR | Growth in per capita state income | EPWRF/ RBI |
| Coastal | Dummy=1 if a state is coastal, else zero | Wikipedia |
| Merger | Unity for the bifurcated states in 2001, else zero | Wikipedia |

*Empirical Strategy*

To examine the impact of monetary policy on informal finance, we run regressions of the following form:

$$y_{s,t} = \alpha_o + \alpha_1 (MYP)_t + \gamma' X_{s,t} + D_{s,t} + Merger_{s,t} + \varepsilon_{s,t}$$

**(1)**

where *s* indexes state, *t* indexes year. In (1), the dependent variable is the proportion of households dependent on informal finance (and its sub-components). The coefficient of interest is $\alpha_1$, signifying the impact of monetary policy on informal finance.

**X** is a vector of state-specific variables, such as the sectoral share of unregistered manufacturing (proxy for the broad credit channel), credit-to-NSDP ratio (proxy for financial penetration), bank offices per lac of population (proxy for financial inclusion), government expense to NSDP (a control for government size), standard deviation of state-level domestic product deflator (as a proxy for uncertainty) and finally, natural logarithm of literacy (proxy for human capital); $\varepsilon$ is the error term. Akin to Gallup et al. (1999), we include a dummy variable (D) which equals one if the state is coastal, else zero to capture possible interlinkages between geography and informal finance.

Table 3: Impact of monetary policy on informal finance

| | Total | |
|---|---|---|
| | (1) | (2) |
| MYP | -2.9*** | 49.5** |
| | (0.93) | (23.5) |
| Sq. MYP | | -340.8** |
| | | (150.1) |
| Controls | Yes | Yes |
| Coastal | -0.04 | -0.02 (0.05) |
| | (0.05) | |
| GDPGR | YES | YES |
| Merger | YES | YES |
| Obs. | 69 | 69 |
| R-squared | 0.39 | 0.48 |

Standard errors (clustered by state) within parentheses
***p<0.01; ** p<0.05; * p<0.10

*Baseline Results*

The regression results are set out in Table 3. We first briefly discuss the control variables (not reported for brevity). When significant, the coefficient on *Sh_Unreg* is positive, which supports the existence of a *broad credit channel*. Uncertainty is a key factor impacting reliance on informal finance: in column 1, an increase in uncertainty by 1% increases overall reliance on the informal sector by roughly 1.6% points. This supports the existence of an *uncertainty channel.* Across sub-categories, it is observed that an increase in uncertainty raises the dependence on moneylenders and relatives, although the reliance on traders declines. This could arise because traders are agents who typically provide goods (e.g., food grains) on loans and during periods of uncertainty, it is liquid assets (e.g., cash) that are more in demand by households. Higher literacy is observed to lower dependence on informal finance, consistent with prior research (Bhattacharjee and Rajeev, 2010) and supporting the existence of a *human capital channel*. Contrary to established thinking, greater financial inclusion could end up raising the dependence on landlords. This can happen because households have limited collateral. During periods of exigencies, accessing bank loans, which comes with manifold documentary requirements, can prove challenging and impels them to take recourse to landlords.

Our coefficient of interest is MYP. In column 1, the point estimate on MYP equals -2.9 and is statistically significant at the 0.01 level. The magnitudes are economically significant, as well. One possible way to interpret these findings would be to suggest that although a monetary contraction raises the cost of formal finance, given the formal-informal interlinkage (Bell, 1990; Kochhar, 1997; Pradhan, 2013), this also leads to a concomitant increase the cost of loans in the informal sector. The net effect is a reduction in borrowings from the informal sector.

In column 2, we include the squared term of MYP to explore possible non-linearities. The point estimates indicate that the coefficient on MYP is positive, while the squared term is negative. Both of them are statistically significant. In other words, a monetary contraction initially increases informal sector borrowings, but beyond a threshold, overall borrowings decline, presumably because the costs (e.g., conditions and terms of repayment) overwhelm the immediate benefits (e.g., medical and family emergencies).

To test possible non-linear effects, we implement the approach of Lind and Mehlum (2009). Table 4 shows that the marginal effect of monetary policy on informal borrowings is positive and statistically significant at $MYP_{min}$ and negative and statistically significant at $MYP_{max}$. The bottom panel shows that the SLM test rejects the null hypothesis and therefore, our results are consistent with the presence of an inverted U shaped.

Table 4: Lind Mehlum test of non-linearity

| | Total |
|---|---|
| Slope at $MYP_{min}$ | 22.196 |
| Slope at $MYP_{max}$ | -18..695 |
| SLM test for inverse U shape | 1.92 |
| p-Value | 0.03 |
| Extremum point | 0.072 |
| 95% confidence interval (Fieller method) | [-0.043, 0.076] |

We also consider which components of informal finance are influenced by a monetary contraction (not reported for brevity). The results suggest that it is basically borrowing from moneylenders that drive the results. Borrowing from landlords and from relatives initially declines in response to a monetary contraction and increases thereafter. This suggests a possible *substitution effect* among informal financing sources in that a monetary contraction initially raises borrowing from moneylenders, but as the costs become prohibitive, households switch to alternate sources, such as landlords and relatives.

*Is there a pecking order?*

Advancing this argument further, we estimate a regression specification using the same set of independent variables, as earlier. The dependent variable is a dummy which equals one if for any state in a given year, the proportion of households borrowing from landlords exceeds those borrowing from relatives, else zero. Consequently, if a monetary contraction lowers the relative dependence on borrowings from landlords, the coefficient would be negative.

The results in Table 5 suggest that this is indeed the case. More specifically, a monetary contraction lowers the dependence on borrowings from landlords to a much greater extent as compared to that

from relatives. The effect is quantitatively important as well: in the fully augmented model (column 3), a monetary contraction lowers household dependence on borrowing from landlords by roughly 7% points, on average. This lends credence to our conjecture that there is a hierarchy in terms of dependence on informal finance by households.

Table 5: Regression results of relative dependence on borrowing from landlords

| | (1) | (2) | (3) |
|---|---|---|---|
| MYP | -5.512** | -6.557** | -7.397*** |
| | (2.497) | (2.686) | (2.418) |
| Controls | No | Partial | All |
| Coastal | Yes | Yes | Yes |
| GDPGR | YES | YES | YES |
| Merger | YES | YES | YES |
| N.Obs | 69 | 69 | 69 |
| R-squared | 0.25 | 0.29 | 0.39 |

Standard errors (clustered by state) within parentheses
***P<0.01; ** p<0.05; * p<0.10

## IV. Concluding remarks

Employing longitudinal data for Indian states, we examine the impact of monetary policy on informal finance. The analysis appears to suggest a possible substitution effect in that, after an initial increase, borrowing from moneylenders decline at the expense of alternatives such as landlords and relatives. Investigating possible hierarchy among the preferred choices suggests that beyond a threshold, borrowing from relatives tends to be the preferred option.

More often than not, monetary policy focuses on the formal financial sector and tends to short-shrift the informal credit market where availability of timely and cost effective credit remains a challenge. And importantly, the literature treats informal finance as a "catch-all" category with no particular preference for borrowings by households. Our analysis suggests that there is a significant and non-negligible impact of monetary policy on the informal financial sector as well as a well-defined pecking order by which indebted households meet their borrowing requirements. With financial inclusion emerging as a major plank of inclusive growth going forward, this suggests a monetary policy needs to take on board this hitherto neglected segment.

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