Comparing Impact of Broad Money Supply and Stock Prices on the Inflation Rate through Financial Condition Index in the Context of Indian Economy

Sayan Banerjee

Associate Professor, Economics Area, Institute of Management Technology-Nagpur
603, Khullarapartments, Byrmaji Town, Nagpur-440013, India

Abstract

The aim of this article is to explore relative impact of two financial instruments, Broad Money Supply and Share of Stock, on the inflationary pressure in Indian economy. To do so, two separate Financial Condition Index (FCI) are constructed by incorporating these financial instrument variables along with two other monetary variables, namely short term interest rate and foreign exchange rate. The FCIs are then co-related with inflation rate to identify incorporation of which of these two financial variables in FCIyield a better result. It is found out that broad money supply creates greater impact on the financial condition and thereby inflation rate in the context of Indian economy.

I. INTRODUCTION

Until the financial crisis in 2007, it was fairly agreed upon among economists and central banks that economic stability could be ensured through twin regime of inflation targeting and flexible exchange rate (Canuto and Cavallari, 2013). This close relationship between stability and inflation targeting regime created a situation where financial stability was considered as jobof micro prudential authority and supervisory institutions. It was believed that central banks through short term interest rate management could regulate the inflationary pressure and ensure economic stability. The flexible exchange rate, on the other hand, could take care of shocks to the economy that arise from the external sector through an automatic adjustment process.

A minority of the economists had felt that such simple way of implementing monetary policy may be missing some of the important issues of the instability within an economy. In a research paper, Achlain and Klein highlighted the need to incorporate asset prices into measurement of impact of monetary policy as well as designing the same (Achlain and Klein, 1973).

The impact of change in the price of house and equity, and thereby the resulting change in wealth of individual, was identified by Modigliani , who also demonstrated how this 'wealth effect' can have direct impact in the aggregate demand of the economy and thereby inflationary situation (Modiglinai,1971). This provided a theoretical case for incorporating the asset prices and designing and observing the transmission process of the monetary policy in an economy (Goodhart, 2000). All these development led to creation of Financial Condition Index (FCI), which is increasingly becoming popular among economists and policy makers in studying macroeconomic stability.

Financial conditions can be described as the current state of financial variables that influence economic behaviors and the future state of the economy. A financial condition index (FCI) summarizes the information about the future state of the economy contained in these financial variables (Hatzius et. al., 2010).An ideal FCI measures exogenous changes in financial condition, rather than changes in financial variables that reflect the evolution of the business cycle (Dudley, 2010).

The main objective of this paper is to identify between two financial assets, namely Broad Money Supply and Share of Stocks (Equity), which one impact the financial condition and thereby inflation in Indian economy in a more significant way. In order to do so, the author shall develop two separate financial condition index (FCI) for Indian economy. The first FCI shall be developed by incorporating the Broad Money Supply, as measured by the World Bank, with two monetary variables, namely short term interest rate and the official exchange rate. The broad money supply in Indian economy acts as a financial variable as one of the main components of it is currency notes and coins with general public. With much of the Indian economy still outside the mainstream financial services, currency notes act as a reliable source of store of value. Changes in broad money supply, therefore, is treated as an exogenous shocks to the financial sector as it impacts the savings of

individuals who store their value in form of currency notes. The growth of M_3 money supply (Broad money supply) can be treated as one of the potential indicators of future movement in prices within multiple indicators frameworks of the RBI (Ramachandran, 2004). Similar views have been shared by others in their work related to money demand and supply in Indian context like B.B. Bhattacharya (Bhattacharya, 1974) andAshra, Chattyopadhay and Choudhuri (Ashra, et al., 2004) It is, therefore, it is only logical that a FCI could be constructed in Indian context by incorporating broad money supply (M_3) along with monetary variables. The co-relationship between FCI created in this fashion with the inflation rate in economy will be explored to see how financial condition and inflation are related to each other.

The relationship between equity prices and its impact on the aggregate demand side of the economy is well documented(Modigliani, 1971). A change in the equity price changes the total wealth of the household. With such change, the consumption expenditure from the household sector may increase or decrease depending on whether the price change is favorable or not for the holders of share of stocks. The change in share prices and its consequent impact on the consumption level is known as the 'wealth effect' in standard literature of macroeconomics. It is therefore, only logical that when an FCI is being developed for the Indian economy, value of shares traded should become a variable of choice. It will be interesting to identify the relationship between the FCI thus constructed and inflation rate. The implicit believe here is a change in the aggregate demand caused by an exogenous change in the share values be reflected in the changing inflation rate in the economy, when it is essentially of the nature of demand pull.

II. DATA AND METHODOLOGY

The data collected are secondary in nature and sourced from the World Bank Open Data. The time period taken for this analysis is from 1995 to 2015 because this period represents post liberalization era in India. Two variables, namely the short term interest rate and official exchange rate are to be part of both the FCIs. The financial variable, Value of Shares Traded (Equity), is defined as "the total number of shares traded, both domestic and foreign, multiplied by their respective matching prices. Figures are single counted (only one side of the transaction is considered). Companies admitted to listing and admitted to trading" (World Bank). Broad Money Supply is "the sum of currency outside banks; demand deposits other than those of the central government; the time, savings, and foreign currency deposits of resident sectors other than the central government; bank and traveler's checks; and other

securities such as certificates of deposit and commercial paper "(World Bank)

In development of FCIs, weighted sum approach of Goodhart and Hoffman (2002) has been followed. An IS curve estimate has been explored from the time series data of 20 years (1995-2015) taking into consideration variables of immediate interest. Two of them are common for both FCIs, namely, the short term interest rate and official exchange rate. The third variable is the financial variables. While short term rate and official exchange rate are part of standard Monetary Condition Index (MCI), the first FCI is developed by incorporating share value while the second FCI incorporates broad money supply. Inclusion of financial variables in the equation expands the scope of index to capture the indirect development in the stock markets and overall savings of the economy, respectively.

The equation for estimation is as follows:

$$Y_t = \alpha + \beta_1 EX_t + \beta_2 R_t + \beta_3 F_t + \mu_t \qquad (1)$$

Where Y_t = GDP at the time t

R_t = Rate of Interest (Inflation adjusted short term rate of interest) at time t

EX_t = Official Exchange Rate (adjusted against U.S. Dollar)

F_t = value of share traded at time period t/ Broad Money (M_3) Supply at time period t

Construction of the Financial Condition Index:From the estimate, the financial condition index for India has been constructed following weighted sum approach:

$$FCI_t = \sum W_{it} (r_{it}) \qquad (2)$$

Here the weights (W_{it}) have been assigned on the basis of relative impact of (r_{it}), which is real rate of interest, official exchange rate and value of shares traded/ broad money supply, on the aggregate demand. It is important to note here that the weights of real rate of interest (W_r), official exchange rate (W_{ex}) and value of share traded/Broad Money Supply (W_f) add up to one and has been calculated from the coefficient of equation (1) which equals:

$$W_{ex} = |\beta_1| / (|\beta_1| + |\beta_2| + |\beta_3|), \quad W_r = |\beta_2| / (|\beta_1| + |\beta_2| + |\beta_3|)$$
$$\text{and } W_f = |\beta_3| / (|\beta_1| + |\beta_2| + |\beta_3|)$$

An FCI that includes financial asset prices along with short term rate of interest,should demonstrate greater volatility in explaining the inflation rate variation. To identify between the two financial variables which one impact the financial condition and thereby greater volatility in more significant way, the two FCIs constructed are made to run a test against the inflation rate. In this article, consumer price index (CPI) for the time period between 1995 and 2015 has been used for this

purpose.

III. RESULT AND DISCUSSION

The main objective of this article is to compare the impact of financial variables in influencing the inflationary pressure in Indian economy. The FCIs, which have constructed by incorporating financial variable with two common monetary variables could be a useful instrument in doing so. By comparing their co-relation with the inflation rate (as measured through CPI) one can identify which of them are more significant. The following tables are generated after the variables have been estimated and tested against inflation rate.

Table 1.1: Correlation between Financial Condition Index (FCI) obtained with Consumer Price Index (CPI): When the Financial Variable is Broad Money Supply (1995-2015)

Correlations		CPI	FCI_{BM}
CPI	Pearson Correlation	1	.523*
	Sig. (2-tailed)		.018
	N	20	20
FCI_{BM}	Pearson Correlation	.523*	1
	Sig. (2-tailed)	.018	
	N	20	20

*. Correlation is significant at the 0.05 level (2-tailed).

CPI Data Source: World Bank Open Data (www.worldbank.org)

In table 1.1, the Pearson's coefficient of correlation is obtained between the FCI (constructed by incorporating broad money supply along with two monetary variables) and CPI. The value of the coefficient (0.523) shows that there is a positive and moderately strong correlation exists between FCI and the CPI in this analysis. The above result confirms the idea that construction of FCI incorporating Broad Money Supply, would provide a noticeable co-relationship with inflation rate. A change in the broad money supply, may impact the aggregate demand side of the economy, and result in change the inflation rate. Broad money supply captures the developments in the banking sector as well other financial transaction that are driven by currency notes.

Table 1.2. Correlation between Financial Condition Index (FCI) obtained with Consumer Price Index (CPI): When FCI is constructed by incorporating Stock Prices (1995-2015)

Correlations		CPI	FCIst
CPI	Pearson Correlation	1	-.179
	Sig. (2-tailed)		.436
	N	21	21
FCIst	Pearson Correlation	-.179	1
	Sig. (2-tailed)	.436	
	N	21	21

Data Source: World Bank Open Data (www.worldbank.org)

In table 1.2., the Pearson's coefficient of correlation is generated between the FCI (constructed by incorporating stock prices with two monetary variables) and CPI. The value of coefficient (-0.179) shows that there is an inverse but weak correlation exists between FCI and the CPI. The negative, but insignificant correlation highlights the fact that in Indian context, as far as the share values are concerned, not much of its volatility impact the general price fluctuations. This may be because of two probable reasons, first, a rising (or falling) share value (equity prices) does not impact the household consumption decisions at a macro level. In such case, Aggregate Demand (AD) may not be impacted by the share values, and naturally, inflation rate of the economy. The second reason is much of the inflation may stem from shocks to the Aggregate Supply (AS) side of the Indian economy.

IV. CONCLUSION

The existing literature on macroeconomic policy in the context of Indian economy provides us with sufficient ideas that macroeconomic stability, in terms of inflation rate, needs to be monitored and managed not just in terms of manipulation of short term rate of interest and exchange rate by through a closer look at prices of various financial assets as well. However, it is an interesting exercise to compare and therefore, identify which one, among the various financial variables, impact the inflation rate more significantly. This paper indicates that between Broad Money (M_3) Supply and Prices of Shares of Stock (equity price), the former has greater impact in influencing the inflation rate. Such findings, may be useful in future in monetary policy management and its implementations.

REFERENCES

[1] Alchian AA, Klein B. On a correct measure of inflation. Journal of Money, Credit and Banking. 1973 Feb 1;5(1):173-91.

[2] Ashra S, Chattopadhyay S, Chaudhuri K. Deficit, money and price: The Indian experience. Journal of policy Modeling. 2004 Apr 30;26(3):289-99

[3] Bhattacharya BB. Demand and supply of money in a developing economy: a structural analysis for India. The Review of Economics and Statistics. 1974 Nov 1:502-10.

[4] Canuto O, Cavallari M. Asset prices, macroprudential regulation, and monetary policy. Economic Premise. 2013 May;116.

[5] Dudley W. Comments on 'Financial Conditions Indexes: A New Look after the Financial Crisis'. Federal Reserve Bank of New York; 2010

[6] Goodhart C, Hofmann B. Asset prices, financial conditions, and the transmission of monetary policy. Inconference on Asset Prices, Exchange Rates, and Monetary Policy, Stanford University 2001 Mar 2 (pp. 2-3)

[7] Goodhart C, Hofmann B. Asset prices and the conduct of monetary policy. InSverigesRiksbank and Stockholm School of Economics conference on Asset Markets and Monetary Policy, Stockholm, June 2000 Jun.

[8] Hatzius J, Hooper P, Mishkin FS, Schoenholtz KL, Watson MW. Financial conditions indexes: A fresh look after the financial crisis. National Bureau of Economic Research; 2010 Jul 1.

[9] Ramachandran M. Do broad money, output, and prices stand for a stable relationship in India?. Journal of Policy Modeling. 2004 Dec 31;26(8):983-1001