



A Financial Condition Index for India through Incorporation of Commercial Bank and Other Lending

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ABSTRACT

The aim of this paper is to construct a financial condition index (FCI) in context of Indian economy by incorporating a financial variables, namely commercial bank and other lending with two monetary variables, real exchange rate and short term interest rate. The paper explores if this index could act as an indicator of fluctuations in the real economy. The FCI is constructed following a weighted-sum method, with weights been assigned on the basis of estimated relative impact of each of the variables on the gross domestic product of India. The correlation between FCI thus constructed, and the inflation rate in the economy for two decades is found to be rather weak; highlighting the possibility that the dynamics of borrowing and the aggregate demand side of the Indian economy is rather unique.

Keywords: Financial Condition Index, Indian Economy, Commercial Bank and Other Lending

JEL Classification: E30

1. INTRODUCTION

The financial crisis, which occurred in the USA in 2007, resulted into economic recession. The crisis spread throughout the world and within a short time most of the major economies of the world entered either into slowdown or stagnation. This financial disruption is considered as the most serious one since the “great depression” of the early 1930s. For the past few years, the economies across the world are struggling with slow or negative economic growth rate, high unemployment and other economic evils.

This unfortunate developments in the world economy have once again brought to the fore impact of financial sector on macroeconomic outcome. To put it differently, there is a renewed awareness among economists and policymakers regarding importance of financial sector shocks as a significant source of macroeconomic instability.

In the background of this development, the paper analyzes why an index, that summarizes the financial situation of an economy, better known as financial condition index (FCI), is considered as an important tool for policy makers and forecasters. It undertakes

a new econometric research to see how useful a tool FCI could be for analyzing and forecasting business cycles in the context of Indian economy.

The aim of this paper to utilize econometric technique to construct a FCI for India by incorporating commercial banks and other lending with two monetary variables, real exchange rate and short run interest rate. The idea is to explore if incorporation of this financial variable in constructing an index yield a better result as an indicator of fluctuations in the real economy. The rationale for incorporating commercial bank and other lending as part of FCI follows from the findings of M. K. Mahalik and Hrishikesh Mallick, who found out that a significant percentage of housing and real estate price fluctuation is directly liked to it (Mahalik and Mallick, 2011). To put it differently, a changing volume of lending through banks and other sources are often reflected in changing demand in the real estate sector, thereby driving up or down the house prices as the cases may be. One of the channels through which monetary transmission mechanism works, in managing and controlling the aggregate demand (AD) (thereby the inflation rate in the economy) is through changes in the housing and real estate prices. However, since in the context of Indian economy, reliable data for the housing prices are not easily available and

often specific to certain region of the country. Commercial banks and other lending, which includes net commercial bank lending (public and publicly guaranteed and private nonguaranteed) and other private credits, is therefore used as a proxy for housing price.

2. BRIEF REVIEW OF LITERATURE

Before the financial crisis in 2007, it was fairly agreed upon among majority of the economists and the central banks that economic stability can be ensured by the central bank of a country through twin regime of inflation targeting and following a flexible exchange rate (Canuto and Carvallani, 2013). The close relationship between macroeconomic stability and inflation targeting regime created an environment where financial stability was job of micro prudential authority or supervisory institution. It was accepted that central bank through its short term interest rate management could effectively regulate inflationary pressure and thereby economic stability. The flexible exchange rate, on the other hand will take care of shocks to the economy that sourced from the external sector through an automatic adjustment process. It is not surprising that from the late 80s the predominant variable that was used by both economist and central banker for monitoring economic stability were short term interest rate and the exchange rate.

However, a small number of economists had felt that such simple way of persuasion of monetary policy may be missing important aspects of the instability that may build within an economy. In an important research paper, Alchain and Klein highlighted the need to incorporate asset prices into measurement of impact of monetary policy as well as designing the same (Alchain and Klein, 1973).

The importance of change in the price of house and equity, and the resulting change in wealth of individual was identified by Modigliani, who also showed how this ‘wealth effect’ can have direct impact in the AD of the economy and create instability (Modigliani, 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 and Hofmann, 2001).

A new approach toward construction of an index, which incorporated asset prices, for conduct of monetary policy was undertaken by Goodhart and Hoffman. They identified that a typical Phillips curve set up output and oil price show a significant negative correlation. They constructed an “Expanded” IS curve, incorporating interest rate, exchange rate, OECD output, house price and share price (Goodhart and Hoffman, 2002). In the context of OECD, their tests highlight house price effect is stronger than asset price, and sometimes even the exchange rate, in explaining inflation variability. It was shown that this new FCI highlights more volatility than that of monetary condition index (MCI), the traditional tool for design of monetary policy.

A FCI was constructed by Mayes and Viren in the context of Finland’s economy (Mayes and Viren, 2001) that does not include price of stock in the FCI due to insignificance; because of the fact that 70% of Finnish stocks belong to foreigners. There was no direct link from price of stock to Finnish wealth. The FCI,

constructed by them, includes house prices to take monetary policy effects into account more fully. They find that though FCI movements are similar to MCI, it more accurately captures periods of financial volatility.

Montagioni and Napolitano find out inclusion of FCI in Taylor rules provides marginally superior results but FCI doesn’t have immediate interpretations, except for asset price have role in interest rate setting because they contain information about future levels of asset price and output (Montagioni and Napolitano, 2004).

In a more recent work, Hatzius et al. have reviewed existing FCI in the context of financial crisis in the USA. In their NBER working paper (Hatzius et al., 2010) they test whether FCIs are useful tool in predicting effects of financial conditions on macroeconomic outcomes (if such relationship exists). Their paper analyze how FCIs are constructed. It provides a new tool for construction of FCI as the prior FCIs have 3 problems, namely, limited time frame, too few indicators and they do not explain monetary policy and business cycle fluctuations.

The existing literature does not highlight too many attempts in development of FCI in the context of Indian economy, or how central bank could use asset prices in designing and implementing monetary policy. However, a paper by Pradhan explores the nexus between financial development and economic growth in India. Following a vector auto regressive model, he finds out a bidirectional relationship between money supply, market capitalization foreign trade and economic growth (Pradhan, 2009).

In another research, the effective monetary transmission mechanism has been explored by R. Bhattacharya et al. The paper identifies that the most effective route through which the mechanism works is through exchange rate (Bhattacharya et al., 2011).

Quazi and Hye made an attempt to link financial development and economic growth in the Indian context. They find out, using an auto regressive distribution lag model (ARDL), a negative relationship between real interest rate in the short and long run with economic growth. Their research concludes a financial development index (FDI) could help policy maintain a parallel financial sector expansion and economic growth (Quazi and Hye, 2011).

3. DATA AND ECONOMETRIC METHODOLOGY

3.1. Data

The time period taken into consideration for compilation of data is from 1995 to 2015. This is essentially to capture the transmission mechanism in the post-liberalization of the economy, when the market forces could operate with greater freedom in determining the prices of the asset in question. The data for gross domestic product (GDP), monetary variables and total commercial bank and other lending have been collected from the World Bank open data source. All the data, that are analyzed, are in current U.S. dollars.

3.2. Econometric Methodology

In construction of FCI, weighted sum approach of Goodhart and Hoffman (2002) has been followed. The new financial variable incorporated in this paper is that of commercial bank and other lending. The other two independent variables are real exchange rate and short term interest rate.

Following Goodhart and Hoffman, an IS curve estimate has been explored from the time series data of the past 20 years (1995-2015) taking into consideration some of the important variables of immediate interest. Namely, the short term rate, real exchange rate and the commercial bank and other lending. While short term rate and official exchange rate are part of standard MCI, incorporation of the new variable, the commercial bank and other lending, “which includes net commercial bank lending (public and publicly guaranteed and private nonguaranteed) and other private credits” (World Bank) in the equation essentially expands the scope of index to capture the volatility in the housing and real estate prices.

The equation thus developed is as follows:

$$Y_t = \alpha + \beta_1 EX_t + \beta_2 R_t + \beta_3 CB_t + \mu_t \tag{1}$$

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 = Real exchange rate (adjusted against U.S. Dollar).

CB_t = Commercial banks and other lending at time period t.

3.3. Construction of the FCI

From the estimate, the FCI for India has been constructed following weighted sum approach:

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

Here the weights (W_{it}) have been assigned on the basis of relative impact of (r_{it}), which is real rate of interest, real exchange rate and commercial bank and other lending on the AD. It is important to note here that the weights of real rate of interest (W_r), official exchange rate (W_{ex}) and commercial bank and other lending (W_{cb}) adds up to one and has been calculated from the coefficient of equation (1) which equals:

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

$$W_{cb} = |\beta_3| / (|\beta_1| + |\beta_2| + |\beta_3|)$$

A FCI that includes asset prices along with short term rate of interest and exchange rate, incorporate better volatility in explaining the inflation rate variation. One of the ways to check for the usefulness of the index constructed is to run a test against the inflation rate. In this paper, consumer price index (CPI) for the time period between 1995 and 2015 has been used for this purpose.

4. RESULTS

As could be seen from Table 1, the multiple regression model, in which GDP is the dependent and interest rate, exchange rate and commercial bank and other lending are independent variables, the standardized coefficient (β) for the independent variables are obtained as -0.499, 0.624 and 0.229, respectively. The tests for real interest rate and official exchange rate are highly significant with P value for them is < 0.01 ($P < 0.01$). The P value obtained for commercial bank and other lending, however, has a value (0.107) greater than that acceptable level.

In Table 2, the Pearson’s coefficient of correlation is obtained between the FCI constructed by this method and CPI. The value of the coefficient (-0.062) shows that there is a negative but weak correlation exists between FCI and the CPI in this analysis.

The FCI is constructed in this paper by incorporating commercial bank and other lending along with two other monetary variables, namely short term interest rate and the official exchange rate. The commercial bank and other lending has been use as a proxy for the house price (real estate price) as it is (lending) the single most important factor in explaining variability in real estate prices. The idea was to see if incorporation of such asset price along with monetary variable result in better explanation of the volatility in the AD and thereby inflation in the economy. However, the test result, in the context of Indian economy seem to suggest that such correlation is not significant. Even when the FCI and CPI shows a negative correlation, the value is negligible, highlighting the fact that FCI constructed may not be reflecting much of volatility in the AD, and thereby, inflation in the economy. This may be because of two reasons, in the last two decades, for which the data set is created, the dynamics between the lending and real estate price has changed. As a result, house prices may fluctuate without much of changes in the bank lending. This is possible if the house price be subject to certain supply side factors along with demand condition. Second possibility could be that even when house price fluctuations (thereby financial asset price and condition) does

Table 1: The regression coefficient between GDP and exchange rate, rate of interest and commercial banks and other lending (1995-2015)

Model	Coefficients ^a				
	Unstandardized coefficients		Standardized coefficients	t	Significance
	B	Standard error	Beta		
1					
(Constant)	-511266759919.811	525522829934.091		-0.973	0.344
Interest	-132381767157.079	28539399806.513	-0.499	-4.639	0.000
Exchange rate	49405366175.120	10363736095.343	0.624	4.767	0.000
Bank lending	1.867	1.096	0.229	1.704	0.107

^aDependent variable: GDP. GDP: Gross domestic product. Data Source: World Bank Open Data (www.worldbank.org)

Table 2: Correlation between FCI obtained with CPI: (1995-2015)

Correlations		CPI	FCIBL
CPI	Pearson correlation	1	-0.062
	Significance (2-tailed)		0.790
	n	21	21
FCIBL	Pearson correlation	-0.062	1
	Significance (2-tailed)	0.790	
	n	21	21

FCI: Financial Condition Index, CPI: Consumer price index. Data Source: World Bank Open Data (www.worldbank.org)

happen due to changes in the lending amount, the overall impact of such changes may not be strong enough to impact the AD side of the macroeconomy in Indian context.

5. CONCLUSION

Incorporation of commercial banks and other lending along with monetary variables; short term interest rate and official exchange rate for construction of an FCI for India was based on the assumptions that since lending impact real estate prices, which in turn affects the AD demand side of the economy, an FCI that incorporates such a financial variable should show a significant correlation with the inflation rate in the economy. But in case of India, such strong correlation is not found. This may make us look into the dynamics of lending volume and real state price once again and it would be worth exploring if the relationship has undergone any changes in recent past. It may also be worth exploring how much of an overall impact one observe in Indian economy between the housing (real estate) price and the AD side of the economy. To put it differently, it may be possible, in the context of Indian

economy, that the effect of real estate price may not translate into much of a volatility in the AD side.

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