US-Financial Conditions and Macro-economy of Emerging Markets

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Abstract
It is obvious from the history of finance that we are unable to capture the broader horizon of financial conditions with just a few variables and a plausible answer to this issue can be financial innovations. Policymakers, regulators, market participants, and researchers affirm this conjunction and emphasis working on this part for enhancing our level of understanding on this part. Keeping this view in front, this study aims to offer an empirical assessment of the effects of the financial conditions of the United States upon the macro-economy of emerging economies using standard Vector Auto-Regression (VAR) Models. I achieve this objective by utilizing the financial conditions index of Brave and Butter (2011) to access emerging economies. I found that macro-economic variables respond to the financial conditions of the United States however magnitude varies from country to country.
Keywords: financial conditions, emerging markets, SVAR

1. Introduction

"When the US sneezes, the rest of the world catches a cold." (Barakchian, 2015). There is mounting evidence that economies around the globe are more integrated, especially in the last few years (Saving, 2006). Financial development and liberalization are major reasons for this integration. Due to financial integration, we may observe co-movement among variables at the international level; the extent may vary but this is true for many countries, especially at the macroeconomic level. This co-movement is also true in times of turmoil such as the collapse of housing prices resulting in not on the collapse of investment domestically but also a strong wave of crisis not in nearby countries but also in faraway countries were reported. One possible reason that seems the front is that transmission of shock results in contagion effects (Kazi, Wagan, & Akbar, 2013).

It's a well-established belief of many researchers and economists that the key reason behind this contagion is the active role of U.S. policies (Ehrmann & Fratzscher, 2009), (Carmassi, Gros, & Micossi, 2009). One more strong reflection of the crisis is that in the presence of financial innovations, it's difficult to capture the financial horizon with the help of a small number of variables as traditionally being applied. Policymakers, researchers, regulators, and other market watchers have all acknowledged the significance of the interconnectivity of traditional and newly developed financial markets and their link with the economy. Thus, it can be said that monitoring financial stability requires an understanding of evolving paradigm of the financial world and its link with the economy (Brave & Butters, 2010; Ali, 2022). After the initial hit of the crisis in advanced countries, financial turmoil hit emerging economies; the stock market, exchange rate, and sovereign debt all came under pressure (Balakrishnan, Danninger, Elekdag, & Tytell, 2009), (Calvo, Izquierdo, & Mejía, 2008) and many others).

The question of whether financial conditions predict economic activity has a long history in economics. The conclusion by Stock and Watson (2003) that "some asset prices predict inflation or output growth in some countries in some periods" epitomizes the common view among econometricians that financial indicators are too noisy and erratic to be exploited for macroeconomic forecasting. Yet macroeconomists have got to the conclusion that financial shocks are a vital source of business cycles ((Balcilara, Thompson, Guptab, & Eyden, 2016), (Alessandria & Mumtaz, 2017), (Opschoor, Dijk, & Wel, 2014) (Jermann & Quadrini, 2012), this suggests that financial information should be utilized in right conditions for beneficial prediction of macroeconomic fluctuations. To work on this objective, most of the empirical evidence is based upon vector auto-regressions (VAR) models (Potts and Yerger, 2010; Owyang and Wall, 2009; Boivin and Giannoni, 2006 among many others). It is being observed that little attention is paid to the question of to what extent the financial conditions of advanced countries have an impact on the macro-economy of the emerging economies shocks.

In this paper, I have worked to fill this gap by studying the transmission of U.S. financial conditions in emerging markets. Having strong implications for emerging markets, this paper is an effort to provide an empirical assessment of the effects of the financial conditions of the United States upon the macro-economy of emerging economies. To work on this objective, the paper investigates whether brave and Butters (2011)'s FCI influences the exchange rates, interest rates, and stock markets.

Barsky and Sims (2011) use the SVAR method to study the response to confidence innovations of news, animal spirit, and pure noise in the New Keynesian framework. In the same way, we use the impulse response functions generated from SVAR to investigate the impact of the United states' financial conditions upon the macro-economy of emerging economies. Barsky and Sim's (2012) model uses confidence innovations' shock to other variables. Whereas in this study, FCI is used, and the response of macroeconomic variables is studied. The main purpose of using U.S. financial

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condition shocks is to identify the predictive power of financial conditions of major economic variables of emerging markets. For this purpose, the predictive power of financial conditions is tested upon major macroeconomic variables namely short-term and long-term interest rates, exchange rates, and stock markets. Impulse response affirms the predictive power of the financial conditions of macroeconomic movements in emerging markets. This finding echoes the findings of Brave and Butters (2011) who established that it is likely to use the financial condition index to increase upon predictions of events of economic activity over short and medium forecast horizons. Similar findings can be seen in studies by Koop and Korobilis (2014), Hatzius et.al (2010), Debuque and Bautista (2013), and many others.

This paper offers the following contribution to the literature. First, most of the studies on the transmission of financial conditions are available on advance countries such as Hatzius (2010), Brave and Butter (2011), and many others. This study covers emerging countries for studying the possible contagion impact arising from advanced countries. Secondly, previous studies have majorly focused on an aggregate activity for studying the macro-economic impact, in this study, other major macro-economic variables are being used for the assessment of contagion impact.

The rest of the paper is organized as follows: section 2 covers important literature on the area under study, section 3 econometric model, section 4 results, and section 5 is a discussion and conclusion.

2. Literature Review

This study aims to add to the literature on the impact of the financial condition index on the economic mortgage crisis of 2007 with its significant negative impact on leading economies has highlighted the need for a better understanding of the link between financial conditions and macro-economy. For this reason, considerable work is available from the world's eminent researchers. Brave and Butters (2011) constructed an FCI for the USA using many variables and prove that this index can forecast short-term and medium-term economic activity. Gumata et.al (2012) constructed an index for South Africa and found that this index is having strong predictive power in the short run. Hetzius et.al (2010) also constructed an index for the USA and found that the relative predictive power of the index is unstable this index performs well in unusual financial stress periods, and this can forecast economic conditions, especially during stressful times. Gonzales and Bautista (2013) constructed FCI for five Asian economies namely Hong Kong, China, Japan, Malaysia, Korea, and Singapore. They concluded that FCI predicts the economy more than benchmark AR models. FCI helped forecast the economy.

Alessandri and Mumtaz (2017) hypothesized that the links between credit markets and the real economy tighten in a crisis, and financial indicators might be particularly useful in forecasting the macroeconomic outcomes associated with episodes of financial distress. They examined this conjecture by using a range of linear and nonlinear VAR models to generate predictive distributions for US inflation and industrial production growth. To capture the state of financial markets they employed the Financial Condition Index (FCI) constructed and maintained by the Chicago Fed. Financial variables display significant predictive power over the Great Recession period, particularly if used within a threshold model that captures the structural break associated with the crisis. However, the Great Recession is unique: financial information and thresholds make little differentiator forecasting before 2008. Balcilara et.al (2016) used a previously constructed index for finding its ability to forecast the South African economy. He found the hat economy responds nonlinearly the financial conditions, that output and treasury bills are affected by crisis upswings, and that inflation is the responsiveness during a crisis.

Beaton et.al (2009) study the effect of financial shocks at zero lower bound like in the current crisis on real activity. They found that the impact may be amplified at higher interest rates during a financial crisis. Opschoor et.al (2014) studied to find the impact of financial conditions on the stock market by using Bloomberg FCI. They found that the worst financial conditions are associated with high volatility and a correlation between stock returns.

From the literature, it can be established that FCI does have implications for the economies, but it can also be seen that plenty of studies are on advanced economies. There is a lack of studies covering emerging economies. Secondly, the major focus of the studies is on forecasting economic activity or growth (e.g., GDP) or interest rates. Other strong variables like the exchange rate are not employed. Furthermore, there is a lack of studies on response analysis of emerging markets of the financial conditions of advanced countries.

This study expands the research on the international transmission of shocks with emphasis on how U.S. financial shocks impact emerging economies, using the SVAR model with bootstrap after bootstrap method, hence allowing for detailed analysis on the subject.

3. Econometric Methodology

To study the transmission of shock to the economies majorly two methods are in use namely structural macro models and VAR models. Structural models are criticized by Sims (1980) in his seminal work to a great deal and VAR models are proposed as alternatives. VAR models are in great use by notable researchers for the study of transmission mechanisms (e.g., (Brave & Butters, 2010) and many others).

3.1. VAR Model

Vector Auto regression models are employed for economic analysis. in this study vector auto-regression model proposed by Barsky and Sims (2011) was employed. VAR models have been used to study shocks of different natures as Sims and Zha (2006) used VAR model to study the money impact upon output; Blanchard and Quah (1989) importance of demand and supply on business cycles; Blanchard and Perotti (2002) fiscal policy impact; and by Gali (1999) to study the relationship technology shocks and worked hours. VAR models multivariate and linear demonstration of a vector of observables on its lags and in other cases variables as constant or trend. In VAR models, we make explicit identification assumptions isolating the estimation of the behavior under study.

VAR model can be written as

$$y_t = [y_{1,t} y_{2,t} \dots y_{n,t}]'$$
Eq. 1

where:

y_t = vector with the value of n variables at time t

as reduced form VAR, it can be written as:

$$y_t = G_0 + G_1 Y_{t-1} + G_1 Y_{t-1} + \dots + G_1 Y_{t-1} + \varepsilon_t$$
Eq.2

where:

- G_0=(n*1) vector of constants
- G_1=(n*n) matrix of coefficients
- ε_t=(n*1) vector of white noise innovation
- $E[e_t] = 0$
- $E[e_t e_t'] = \Omega (not\ diagonal) if\ t = \tau\ otherwise\ 0$

assumption about error term:

- $E[e_t e_t'] = \Omega$ for $t \neq \tau$
- in matrix notation:
- $y_t = G_1 Y_{t-1} + e_t$

$in\ this\ study$:

- $$y_t = \begin{bmatrix} y_{1,t} \\ y_{2,t} \\ y_{3,t} \\ y_{4,t} \\ y_{5,t} \end{bmatrix} = \begin{bmatrix} FCI \\ IR \\ GBR \\ R \\ S \end{bmatrix}$$

VARs are performed by ordinary least square (OLS) equation by equation. Residuals take on recursive ordering.

3.2. Financial Conditions and forecasts of macro-economy

How does a surprise movement in U.S. financial conditions affect forecasts of future macroeconomic conditions of emerging economies? For giving standard answer to this question, it is required to run a VAR model comprising FCI and macro-economic variables and for considering the partial derivatives of macro-economic conditions at different horizons with respect to innovations in Financial conditions. This can be taken like generalized impulse response function in Pesaran and Shin (1998). Here orthogonalize is only shock means FCI not ordering of macroeconomic variables. It is orthogonalize first in the model.

Furthermore, Impulse response analysis is done. It traces effects of structural shocks on endogenous variables. By impulse response function we may see the mechanism by which shock spread over time. For finding impulse response we have employed Kilian (1998) bootstrap after bootstrap method. For this method VAR is estimated using OLS and 1000 draws for impulse response are generated for bootstrap, then bias corrected estimator is calculated that later on is employed for generating 2000 new draws using bootstrap.

3.3. Selection of Variables

Transmission channels are not working separately but their mutual affect get amplified, moreover this depends upon state of financial system and economy (klacso, 2013). Mapping link between economy and financial system has great significance and urgency after the crisis more. Majority of econometric models for forecasting majorly have used interest rate. This strategy may work in normal time but in crisis time, with this single variable we are unable to capture all the interactions between financial system and economy. For this reason, many authors have suggested to use an index indicating financial condition for the study of transmission mechanism.

The aim of the study is to study the impulse response of emerging markets of financial market of the United States. To work on it, Vector autoregressive (VAR) systems are estimated for data from Brazil, Chile, Czech Republic, Greece, Hungary, India, Malaysia, Pakistan, Mexico, Poland, Russian Federation, and South Africa. Data is taken from the IFS database and from other official sources.

The estimation is done on quarterly data with four lags using the rule of thumb. Unit roots are tested using Ng and Perron (2001) procedure, and non-stationary series are differenced to be made stationary. All data is standardized.

Proxy for the financial condition is FCI from the USA developed by Brave and Butters (2012), it comprises a weighted average of 105 indicators of financial activity that Broad coverage of the financial system of Money markets, Debt, and Equity markets, Traditional and "Shadow" banking system and Useful in monitoring financial stability and forecasting.

For each country, a proxy for short interest rate R is the money market rate for Brazil, Czech Republic, Malaysia, Pakistan, Poland Russian Federation and the discount rate for Chile, Hungary, India, T-bill rate for Greece, Mexico, and central bank policy rate for south Africa, a proxy for long term interest rate is saving rate for Brazil and a government bond rate GB for the rest of the countries, a real effective exchange rate (index) REER as a proxy of the exchange rate, and a stock prices S proxy of the stock market. for Pakistan and Greece, government bond was missing at some points. It was handled using interpolation. For this econometric method is employed named. High-frequency variables are converted to low-frequency variables using period-end values.

According to Meenai (2010), Monetary policy is a complex phenomenon. It is not transmitted through one channel but many. The process is supposed to begin with the transmission of open market operations to market interest rates, either through the supply and demand for money more broadly. from there it may proceed through any of several channels. The same transmission model is assumed for the FCI transmission model. It is assumed that financial conditions do have an impact on selected channels and from those channels, the effect is being transmitted to the rest of the economy.

This study, it is tried to extend the data set on a long horizon to assess how the U.S. financial conditions result in contagion effects internationally and how financial integration and globalization have impacted this transmission mechanism. For this reason, in this study impact of FCI to emerging economies upon the following channels is studied:
➢ Interest rate channel (short-term and long-term)
➢ Exchange rate channel
➢ Stock market channel

In this study, it is claimed that financial conditions have a predictive power of macroeconomic variables. Our first sub-claim that states that there is an exchange rate puzzle like Dornbusch's exchange rate overshooting (The exchange rate is said to overshoot when its immediate response to a disturbance is greater than its long-run response) in transmission mechanism rests upon the consideration that in the era of globalization, all countries are affected by outer word and upon economies, this direction comes from the exchange rate. For this reason, the exchange rate overshoot. Sichei (2005) confirmed Dornbusch's Hypothesis in the case of South Africa, while Tu & Feng (2009) rejected this hypothesis in the case of the U.S. and Germany. Our second claim state that FCI has an impact on the interest rate (both short-term and long-term) in the short run. Another assumption regarding the stock market says that it has an impact in long run.

4. Results

In this session, the results of financial shocks on economies are presented. The shaded areas represent one standard error bias-corrected bootstrap confidence bands of Kilian (1998).
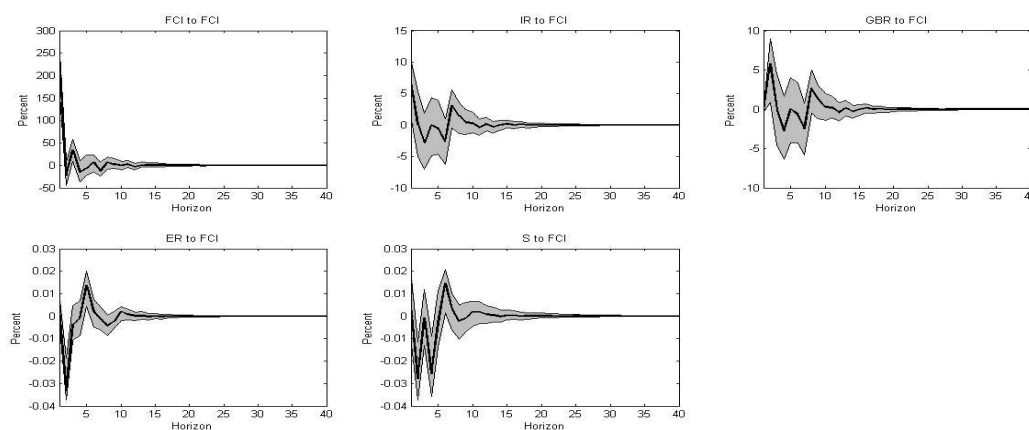

Figure 1: transmission to Brazil

The impulse response functions in the case of Brazil are presented in figure 1. This allows seeing the financial condition index's impact mechanism unfold by illustrating the response of the system to a shock in measure of the

financial condition index. An innovation to FCI has implications for all the variables in short term. A one standard deviation innovation in FCI in short-term interest rate is followed by the strong impact is followed by volatile and rapidly building but temporary response. In terms of long-term interest rate is also volatile but strong, highly positive at the start, and rapidly building like short-term interest rate and temporarily in nature. Exchange rate overshoot in the start, an initial negative response is followed by a positive response that ends shortly; this finding supports Dornbusch's exchange rate overshooting hypothesis. Response of the stock market is also low and volatile and temporary in nature. Response of all the variables is temporary in nature. Financial conditions Innovations thus clearly convey important information about the future paths of macroeconomic variables, most notably at shorter horizons.
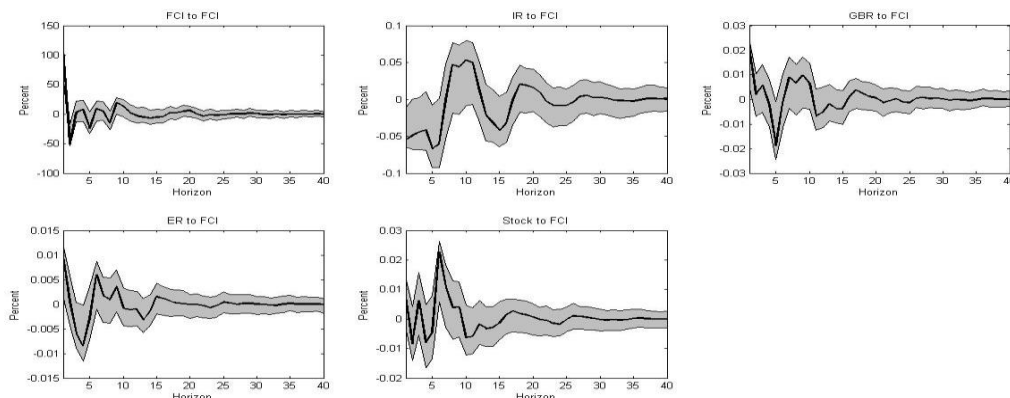

Figure 2: Transmission to Chile

The impulse response functions in the case of Chile are presented in figure 2. This allows seeing the financial condition index's impact mechanism unfold by illustrating the response of the system to a shock in measure of the financial condition index. An innovation to FCI has implications for all the variables in long run. A one standard deviation innovation in FCI in short-term interest rate is followed by strong and volatile and rapidly building, the response is of permanent nature and positive in long run. Response to long-term interest rates is negative in the start followed by a positive stable and permanent response. Response of exchange rate is like Dornbusch's overshoot; it overshoots in the start but stabilizes in the long run; this finding supports Dornbusch's exchange rate overshooting hypothesis. Stock markets respond to volatility in the start but positive and stable response in long run. Response of all the variables is of permanent nature. Response of all the variable is temporary in nature. Financial conditions Innovations thus clearly convey important information about the future paths of macro-economic variables, most notably at longer horizons.
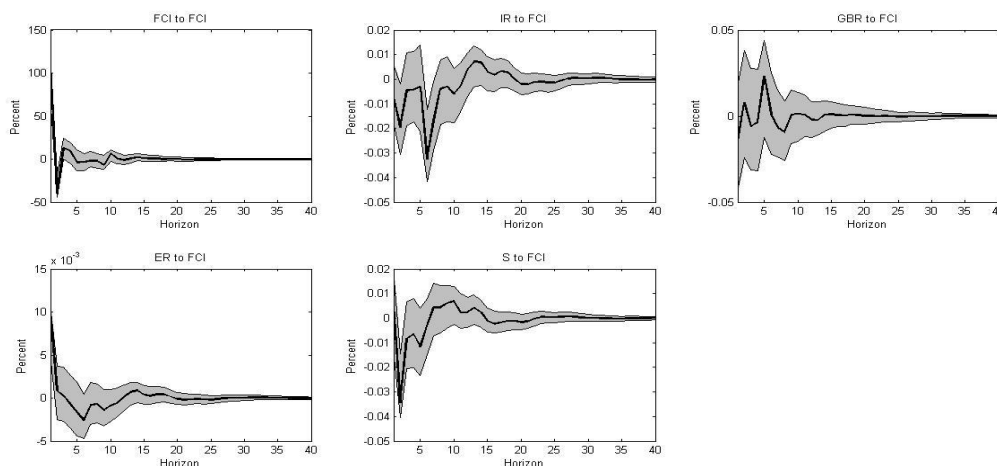

Figure 3: Transmission to the Czech Republic

The impulse response functions in the case of the Czech Republic are presented in figure 3. This allows seeing the financial condition index transmission mechanism unfold by illustrating the response of the system to a shock in measure of the financial condition index. An innovation to FCI has implications for the variables in short term. Response to the interest rate is volatile and negative in the short run but positive and stable in long run. Long-term interest rate responds positively in short term, but this response is of temporary nature. The exchange rate behaves negatively in short term but stabilizes in long run; this finding does not support Dornbusch's exchange rate overshooting hypothesis while the stock market behaves positively in the short run and stabilize after wards. Response of variables are of temporary nature. Response of all the variable is temporary in nature. Financial conditions Innovations thus clearly convey important information about the future paths of macro-economic variables, most notably at longer horizons.
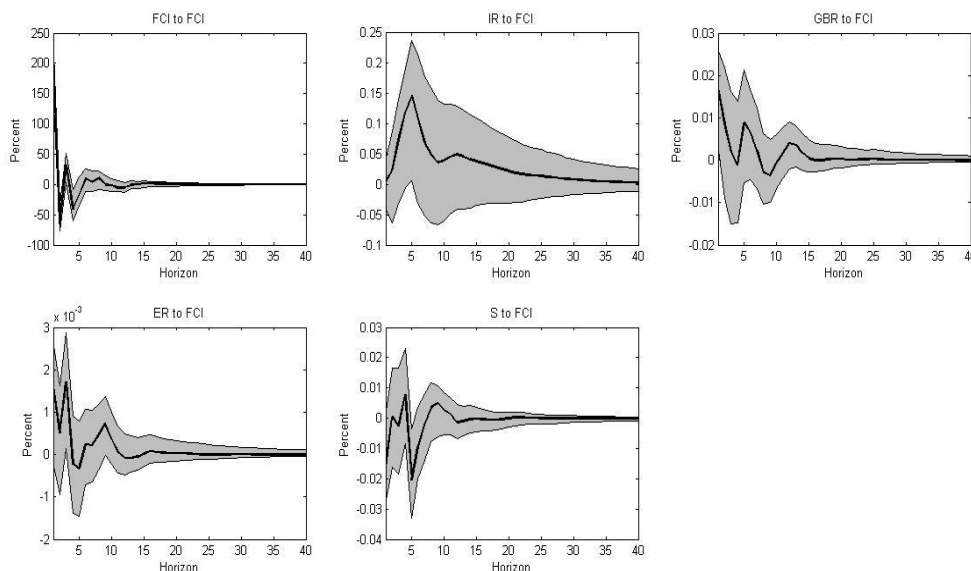

Figure 4: Transmission to Greece

The impulse response functions in the case of Greece are presented in figure 4. This allows seeing the financial condition index transmission mechanism unfold by illustrating the response of the system to a shock in measure of the financial condition index. A one standard deviation innovation to FCI has strong implications for the short-term interest rate in short term, after the initial hike it is being followed by a positive and stable response in the long run. Response to long-term interest rates, exchange rates, and the stock market is of temporary nature, volatile in the start but stable in the long run. Response of exchange rate is overshooting; this finding supports Dornbusch's exchange rate overshooting hypothesis, Response of all the variables is temporary in nature. Financial conditions Innovations thus clearly convey important information about the future paths of macroeconomic variables, most notably at longer horizons.

The impulse response functions in the case of Hungary are presented in figure 5. This allows seeing the financial condition index transmission mechanism unfold by illustrating the response of the system to a shock in measure of the financial condition index. A standard deviation innovation to FCI has implications for the variables in the long term. Response to the short-term interest rate is strongly positive in short term followed by a negative response that stabilizes in the long run, response is of permanent nature. Response of long-term interest rates and the stock market is volatile throughout the time span; a positive high response is followed by a negative making a V-shaped response in the short term that keeps a volatile movement in the long run. Response of exchange rate supports the Dornbusch's exchange rate overshooting hypothesis. Response of all the variable is temporary in nature. Financial conditions Innovations thus clearly convey important information about the future paths of macro-economic variables, most notably at longer horizons.
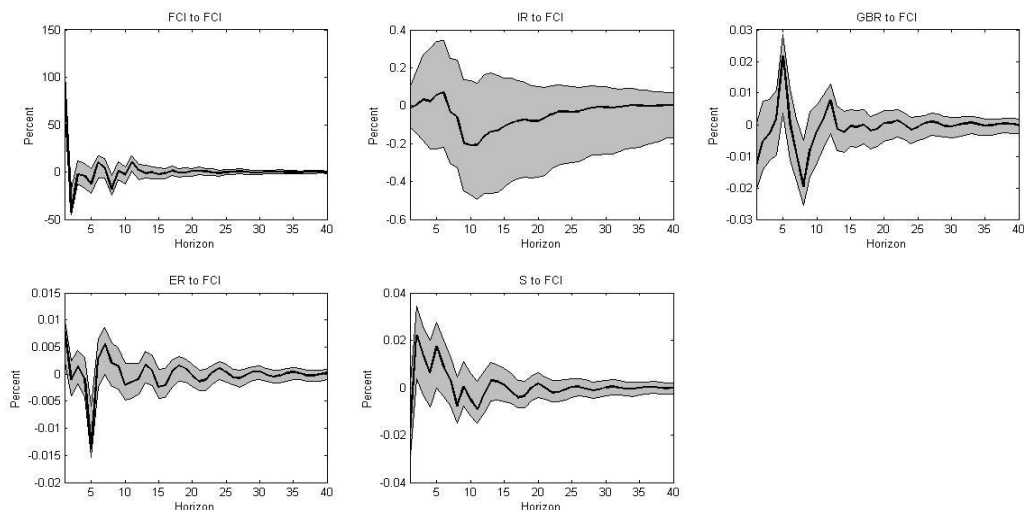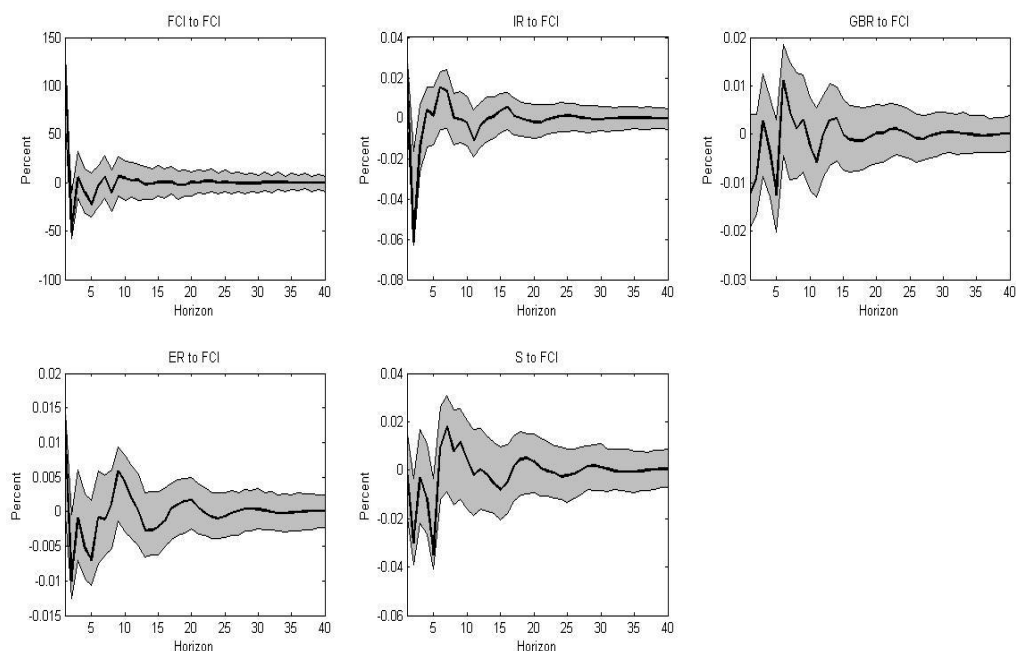
Figure 5: Transmission to Hungary

Figure 6: transmission to India

The impulse response functions in the case of India are presented in figure 6. This allows seeing the financial condition index transmission mechanism unfold by illustrating the response of the system to a shock in measure of the financial condition index. An innovation to FCI has implications for the variables in the long run. Response to short-term interest rates is negative initially followed by a positive response that's permanent nature. Response if the long-term interest rate is volatile in the short term that tends to stabilize in the long run. This is true in the case of the exchange rate and the stock market which is volatile initially but strong and positive in the long run; this finding supports the Dornbusch's exchange rate overshooting hypothesis. Response of all the variable is temporary in nature. Financial conditions Innovations thus clearly convey important information about the future paths of macro-economic variables, most notably at longer horizons.
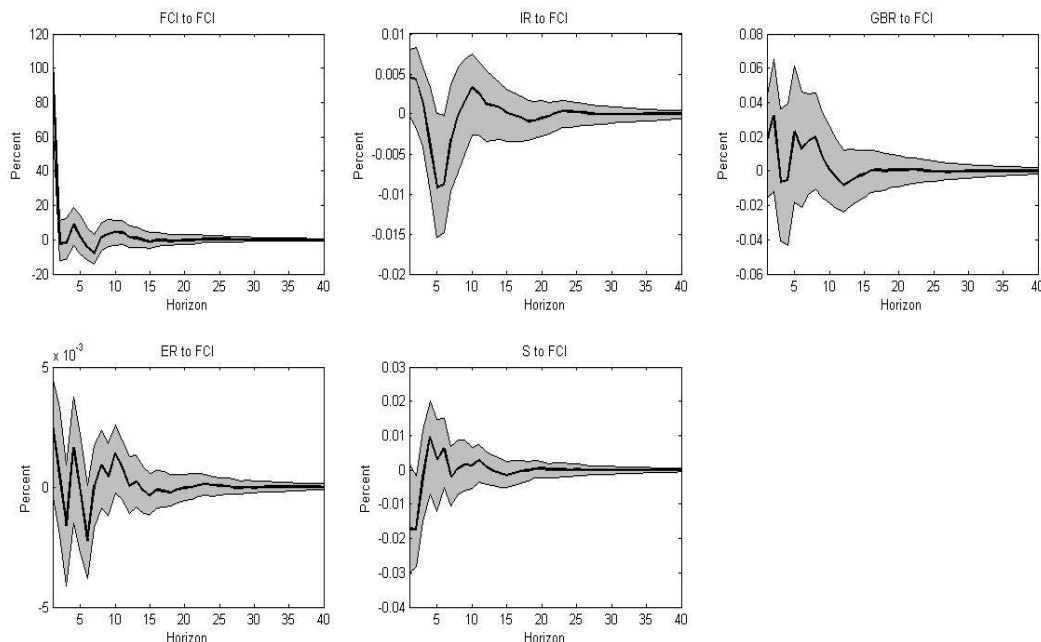
Figure 7: transmission to Malaysia

The impulse response functions in the case of Malaysia are presented in figure 7. This allows seeing the financial condition index transmission mechanism unfold by illustrating the response of the system to a shock in measure of the financial condition index. An innovation to FCI has implications for the variables in short term. One standard deviation innovation in FCI is being followed by a negative response in short term but a positive in the long run that faded away with time, response of long-term interest rate is volatile in the short term that also faded away in long run, exchange rate is highly volatile in short run that tends to faded away in long run; this finding supports the Dornbusch's exchange rate overshooting hypothesis and response of stock market a positive initial response is being followed by stable response that tends to faded away. Response of all the variable is temporary in nature. Financial conditions Innovations thus clearly convey important information about the future paths of macro-economic variables, most notably at longer horizons.

The impulse response functions in case of Mexico are presented in figure 8. This allow to see the financial condition index transmission mechanism unfolding by illustrating the response of the system to a shock in measure of financial condition index. An innovation to FCI has implications for the variables in short term. Response of short-term interest rate is negative followed by positive, long term interest rate is volatile, exchange rate is positive than negative and stock market is negative followed by positive; this finding supports the Dornbusch's exchange rate overshooting hypothesis. Response is of short-term nature of all the variables. Response of all the variable is temporary in nature. Financial conditions Innovations thus clearly convey important information about the future paths of macro-economic variables, most notably at longer horizons.

The impulse response functions in the case of Pakistan are presented in figure 9. This allows seeing the financial condition index transmission mechanism unfold by illustrating the response of the system to a shock in measure of the financial condition index. An innovation to FCI has implications for the variables in short term. The one standard deviation shock arising in FCI is followed by the volatile response of short-term interest rates that faded away with time. Response of long-term interest rate dies after initial positive and negative wave. Exchange rate die also first negative than positive response; this finding supports the Dornbusch's exchange rate overshooting hypothesis. Response of stock market is strong in the start but die off with the time. Response of all the variable is temporary in nature. Financial conditions Innovations thus clearly convey important information about the future paths of macro-economic variables, most notably at medium horizons.

The impulse response functions in the case of Poland are presented in figure 10. This allows seeing the financial condition index transmission mechanism unfold by illustrating the response of the system to a shock in measure of the financial condition index. An innovation to FCI has implications for the variables in long term. The small impact effects are followed by quickly building response short-term and long-term interest rates and it's of permanent nature.

Response of exchange rate volatile; this finding supports the Dornbusch's exchange rate overshooting hypothesis and stock market is volatile that tend to stabilize with time. Response of all the variable is temporary in nature. Financial conditions Innovations thus clearly convey important information about the future paths of macro-economic variables, most notably at longer horizons.
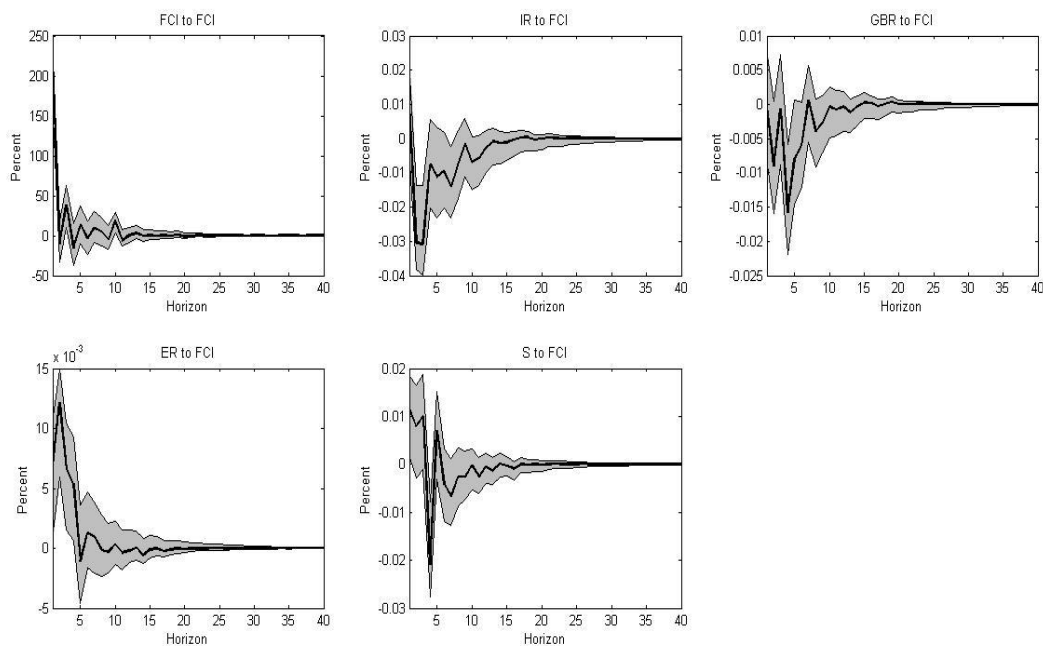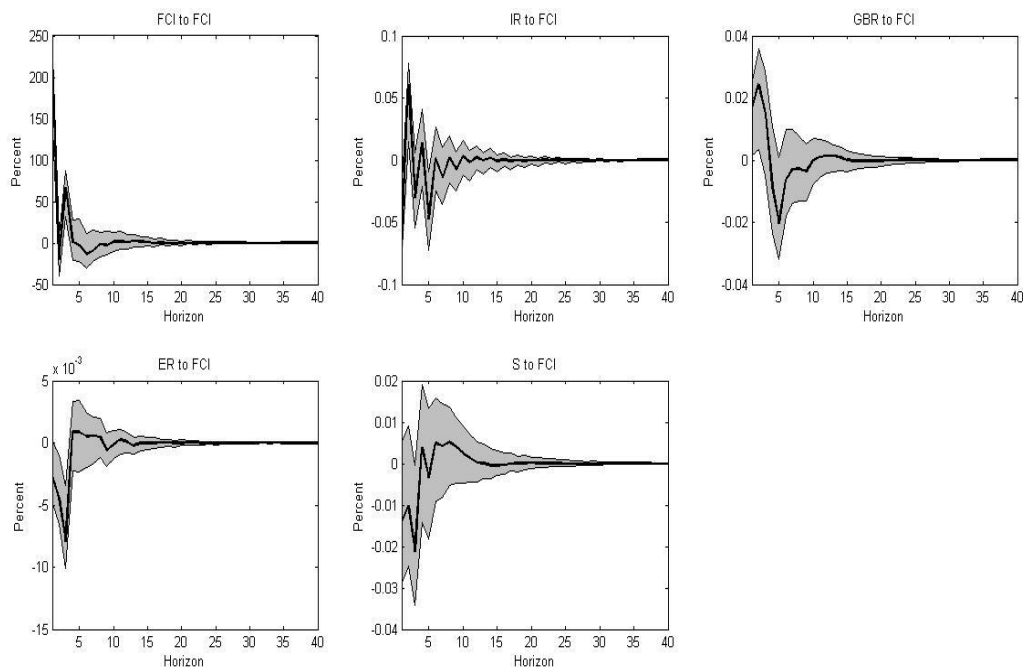

Figure 8: transmission to Mexico

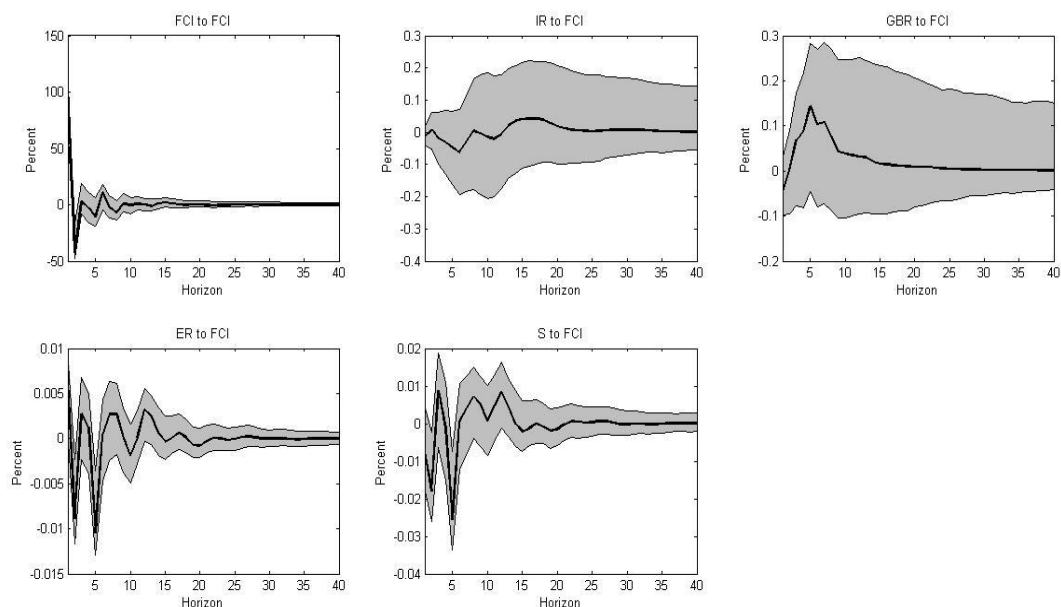**Figure 9: Transmission to Pakistan**
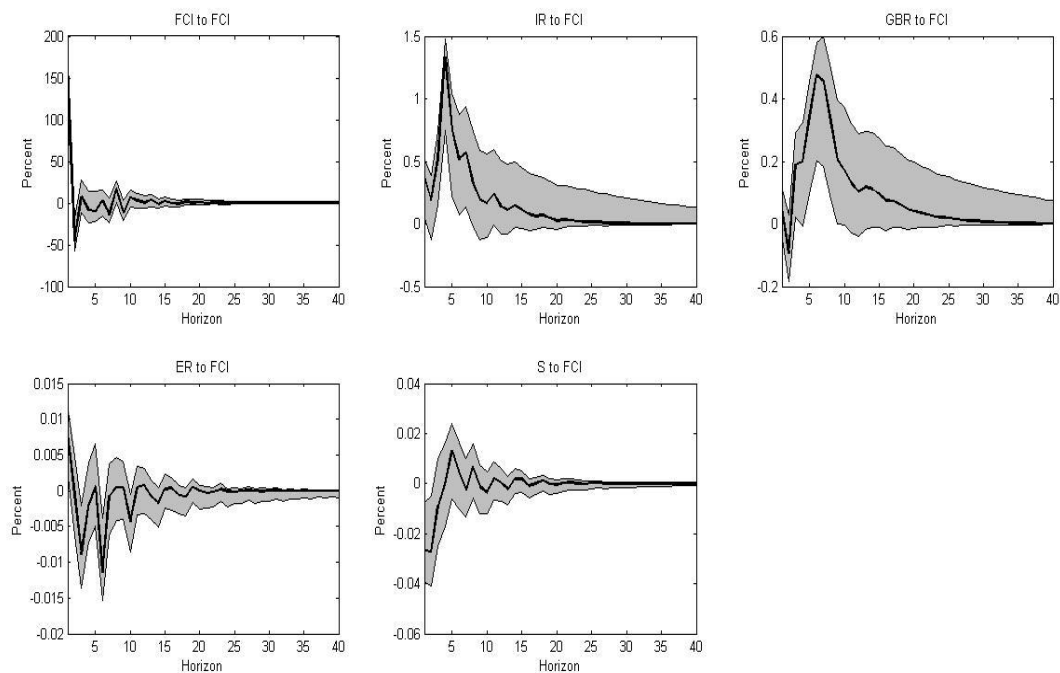
Figure 10: Transmission to Poland

Figure 11: Transmission to Russian Federation

The impulse response functions in the case of the Russian Federation are presented in figure 11. This allows seeing the financial condition index transmission mechanism unfold by illustrating the response of the system to a shock in measure of the financial condition index. An innovation to FCI has implications for the variables in long run. Response to the interest rate is strong, after the initial positive response it tends to stabilize and it's of permanent nature. Response of exchange rate and stock market is volatile but it's of temporary nature; this finding supports the Dornbusch's

exchange rate overshooting hypothesis. Response of all the variable is temporary in nature. Financial conditions Innovations thus clearly convey important information about the future paths of macro-economic variables, most notably at longer horizons.
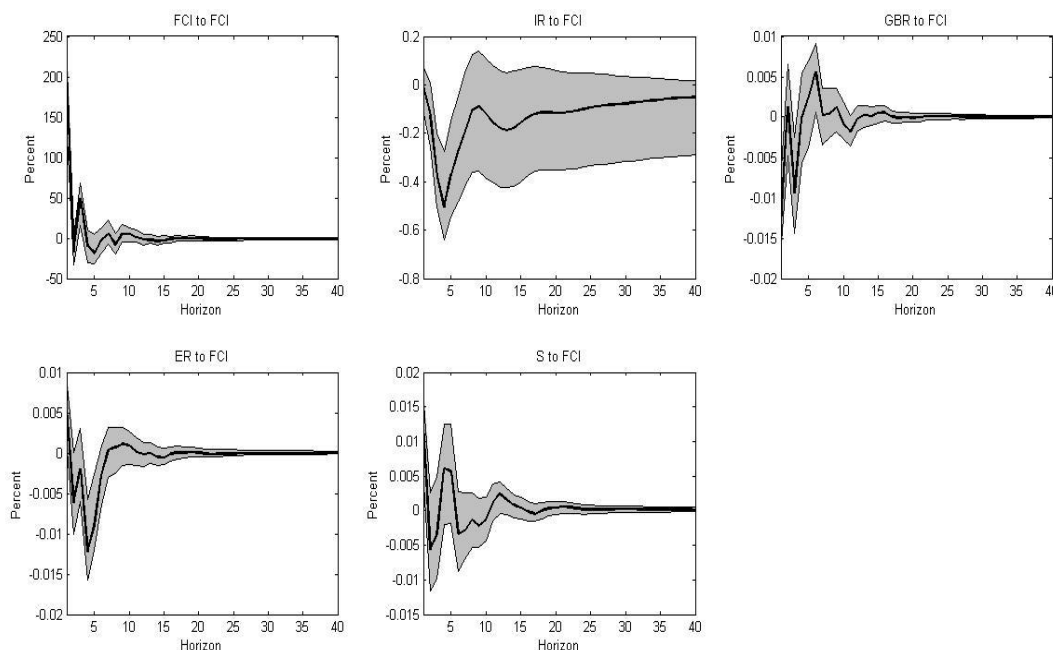

Figure 12: Transmission to South Africa

The impulse response functions in the case of South Africa are presented in figure 12. This allows seeing the financial condition index transmission mechanism unfold by illustrating the response of the system to a shock in measure of the financial condition index. An innovation to FCI has implications for the variables mixed. One standard deviation shock of FCI is followed by a strong response of short-term interest rate that is permanent in nature. Response of long term interest rate, exchange rate and stock market dies off after initial response. Exchange rate overshoots; this finding supports the Dornbusch's exchange rate overshooting hypothesis. Response of all the variable is temporary in nature. Financial conditions Innovations thus clearly convey important information about the future paths of macro-economic variables, most notably at medium horizons.

5. Discussions and Conclusion
This study is an attempt to study the international transmission of US financial conditions on the macro-economic of emerging markets. Impulse response affirms the predictive power of the financial conditions of macroeconomic movements in emerging markets. I found that financial conditions do have an impact on the macro-economy of emerging markets, the extent may vary but it's true for all countries. This finding echoes the findings of Brave and Butters (2011) who established that it is possible to use this index to improve upon forecasts of measures of economic activity over short and medium forecast horizons. Similar findings can be seen in studies by Koop and Korobilis (2014), Hatzius et.al (2010), Debuque and bautisa (2013), and many others.

Looking at the individual variable response, we can see that response of short-term interest rate is initially negative and volatile in the start but positive and stable in the long run in the case of Brazil, Chile, Czech Republic, Greece, India, Malaysia, Mexico, Pakistan, Poland, and South Africa. An exception to this trend is Hungary and Russian Federation where the initial positive response is followed by a negative response that with time shifts into a positive and stable response.

The response to long-term interest rates is volatile that tends to stabilize with time, and this is of permanent nature in the case of China, the Czech Republic, Greece, Hungary, India, Poland, Russian Federation. The volatile yet temporary nature of the response can be seen in the case of Brazil, Malaysia, Pakistan, and South Africa.

The response of the stock market is volatile in short term in the case of Brazil, Czech Republic, Greece, Malaysia, Mexico, Pakistan, Russian Federation, and South Africa while volatile and of permanent nature in Chile, Hungary, India, and Poland.

The response of exchange rate confirms Dornbusch's exchange rate overshooting hypothesis according to this hypothesis there is overshooting in the exchange rate when its immediate response to a disturbance is higher than its long-run response. Such response is being observed in the case of Brazil, Chile, Greece, Hungary, India, Malaysia, Mexico, Pakistan, Poland, the Russian Federation, and South Africa. An exception from this response is the Czech Republic does not overshoot whose reasons are unknown now.

From a theoretical perspective, this study confirms Dornbusch's exchange rate overshooting hypothesis in most of the economy, and from a practical perspective, this study is beneficial for researchers, economists, and market practitioners.

This study is limited by the availability of data. This study started with the objective to work on emerging markets. In the case of emerging markets, well-maintained data is not available. This study may be extended in the future for broader results and application with the availability of data. We were limited by the data time. Furthermore, data were available on different frequencies which also limit us with the application. Future work can be more reliable once these limitations are overcome.

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