Financial stress and Monetary policy Implications in South Africa

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Introduction

- The 2007-2009 financial crisis has greatly influenced the interest of examining the relationship between financial instability and monetary policy.
- The crisis showed that price stability has confirmed not to be a sufficient instrument for financial stability and financial instability can have major negative feedback effects on price stability (Smets, 2014).
- In addition, keeping inflation low and stable was not sufficient to prevent imbalances in the financial system (Cecchetti and Kohler, 2010).

- Economic theories view the relationship between finance and the real economy as neutral(Miller, 1958; Friedman, 1969; Gertler, 1988; Goodhart and Tsomocos, 2007; Wray and Tymoigne, 2008).
- The assertion that financial markets do not affect real output was also assumed for DSGE models (Kashyap and Stein, 1994; and Hubbard, 1998).
- According to Minsky (1963,1981) the theories above were irrelevant suggesting that it is imperative how much credit is extended into the economy and to whom it is extended too.

- Although several studies have been carried out on this subject (see Detken and Smets, 2004; Borio and Lowe, 2004; Bulir and Cihak, 2008), there is limited empirical evidence on the response of central banks to financial instability.
- As a result of academic research multiple sources of financial stress have been developed and later combined to analyse financial fragility in the economy.
- A few of the empirical studies that use the financial stress index find that in times of high financial stress, policymakers should implement policies to stabilize it, since the economy appears to be particularly vulnerable to further growth in financial stress.
- During normal times, policy authorities also need to monitor financial stress closely(Hubrisch and Tetlow, 2015; Rey, 2015; Cardarelli et al, 2011; Davig and Hakkio, 2010; Li and St-Amant, 2010).

Problem statement

- Financial instability has the potential to cause significant macroeconomic costs, as it interferes with production, consumption and investment, and, therefore, defeats national goals of broader economic growth and development (SARB, 2013). The relationship between monetary policy and financial stability is fragile, specifically on the operationalization of issues related to financial stability for suitable monetary policy formulation (Goodhart, 2006). Since the 2008 global financial crises the South African financial system vulnerability and uncertainty has been continuous. Therefore, the research problem that has been identified in this study is that amidst slow growth how can policy makers design and implement financial stability policies. While keeping in mind that the success of this policy has to do synergies though keeping independence with monetary policy, and its macroeconomic impact.

Objectives

- To investigate how monetary authorities in South Africa have responded to episodes of financial stress.
- To explore the transmission channels of monetary policy through both financial conditions and financial vulnerabilities.

Data

- The study uses monthly data from 2006:1 to 2015:12.
- The data is obtained from South African Reserve Bank.
- Following Hubrich and Tetlow (2015) there are five variables. The financial stress index, real GDP growth, credit growth, interest rate and inflation.

Methodology

- The advantage of using an MSVAR with Bayesian estimation model it avoids transforming continuous variables into a binary crisis dummy variable that consequently lose information.
- Prior dating of stress events is not necessary: instead crisis characterization and identification episodes are part of the models output, estimated concurrently with the crisis forecast likelihood in a maximum probability framework (Sims and Zha, 1998).
- According to Sims et al. (2008) a markov switching vector autoregression models, transition states are stochastic.

MS VAR model

- $y_t' A_0(s_t^c) = \sum_{j=1}^{l} y_{t-1}' A_j(s_t^c) + z_t' C(s_t^c) + \varepsilon_t'(s_t^v)$
- y : Endogenous variables
- z : Exogenous variables and intercept terms
- ε_t: Random shocks
- A_0, A_j, C: Coefficient matrices
- s_t^v, s_t^c : Unobserved state variables evolve according to two independent first-order Markov processes:
- $\Pr(s_t^m = i | \, s_{t-1}^m = k) = p_{ik}^m, \;\; i, k = 1,2, \ldots h^m$
- Coefficient switching and switching in shock variances.

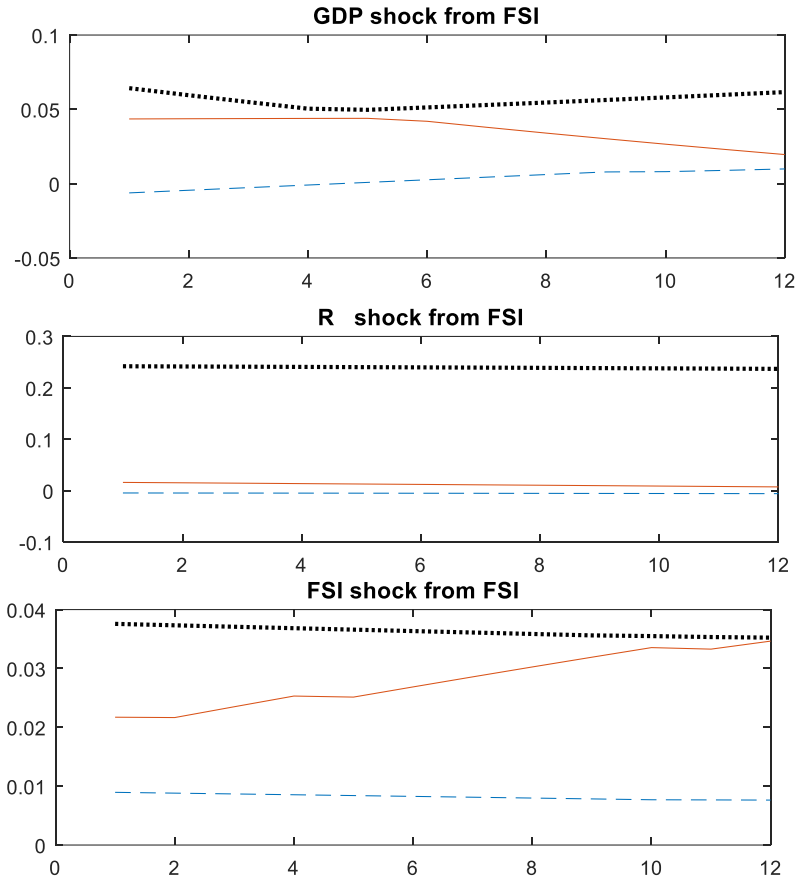
Model estimation and evaluation

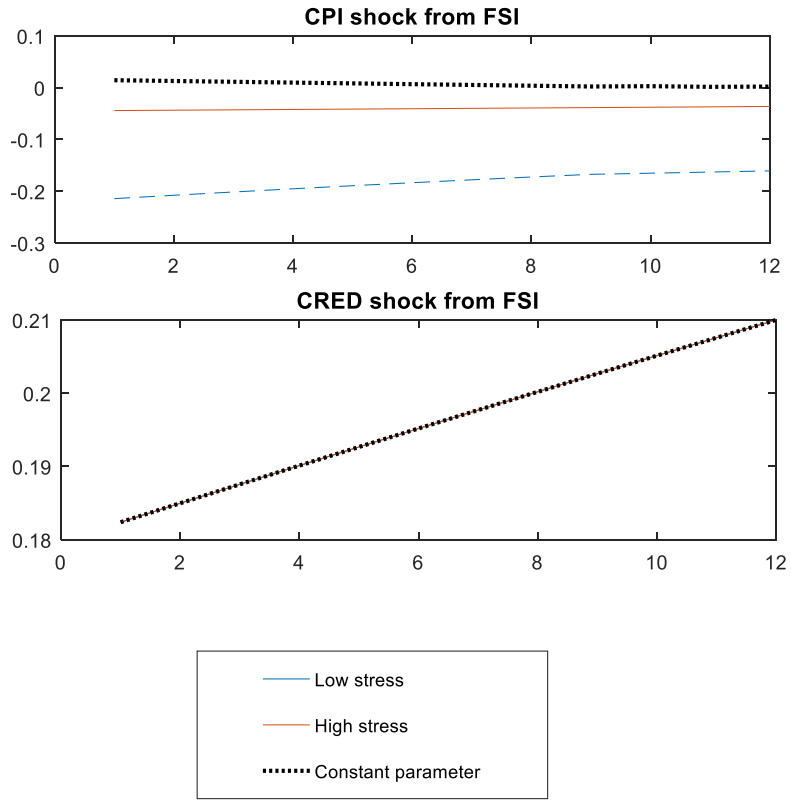
- Following Sims, Waggoner and Zha (2008) the research employs a blockwise optimization algorithm for the posterior mode estimation.
- In step one, blocks are used to divide the parameters and the hill-climbing quasi-Newton optimization routine employs the initial guesses for the parameters.
- *Model evaluation*
- Following Meng and Wong (1996) bridge-sampling method to compute the marginal likelihoods for each model excluding the *X* constant model, for which we adopt the Chib (1996) procedure.

MS-BVAR Marginal Data Densities

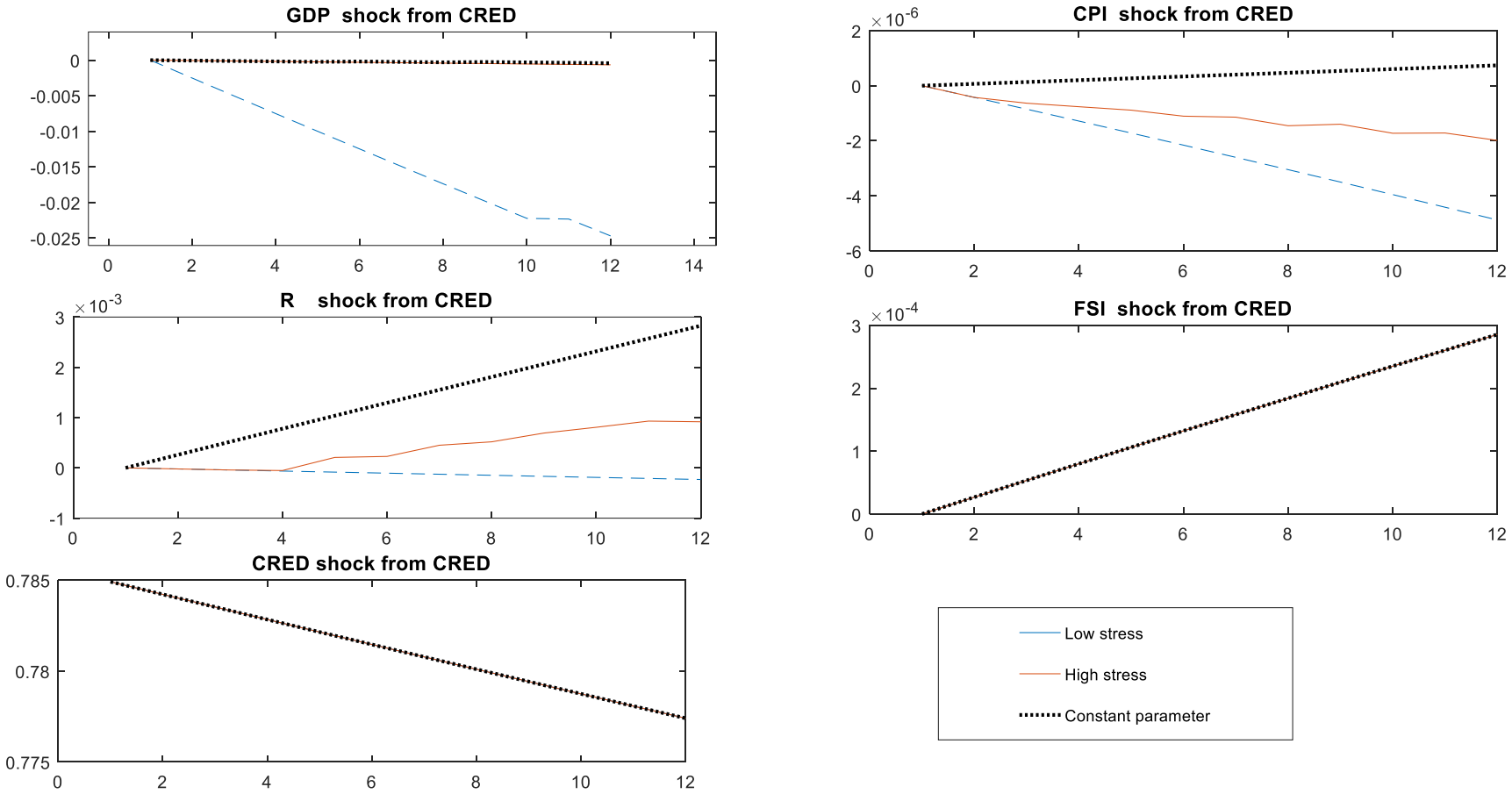
Model	Specification	Log MDD
X	Time-invariant model	-182.2612
X #v	2 synchronized regimes in shock variances	137.7123
X #1c#2v	2 regimes for both the coefficients and variances in all equation (not synchronized)	187.3664
X #cv	2 regimes synchronized equation for both the coefficients and variances	163.6732

Impulse Response function to FSI Shock





Impulse Response function to Bank Lending Shock



Conclusion

- Our analysis shows substantial evidence that the South African economy is subject to occasional switches into what is called periods of high financial stress.
- This research reveals that implications concerning the behaviour of monetary policy that is derived from a constant-parameter Gaussian model might be unsuitable for times when the policy is significantly influenced by financial stress movements.
- We found evidence that propose that if other instruments can be found to rule out occasional switching in episodes of high stress coefficient, it likely that sometimes it might not be necessary for monetary policy to contribute to sustaining financial stability.

- But in South Africa fluctuations in the rates of interest have an influential and relatively anticipated effect on the broader economy. Contrary to the above capital requirements may be authoritative in relation to it’s effect on bank robustness and uncertain but have a moderate possibility of small impacts on the broader economy.
- Therefore, regulating bank capital comes naturally for achieving financial system stability because it directly affects the systemic risks of the banking sector.