

EQUITY PRICES, MONETARY POLICY AND ECONOMIC ACTIVITIES IN SOUTH AFRICA

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Introduction

- The unresolved debate on whether monetary authority should react to asset prices inflation in general as much as to goods and services price inflation in formulating monetary policy decisions should again warrant scrutiny in the light of the current financial crisis.
- Burst of asset price bubble
- The interconnection between equity prices, internal policy (such as monetary policy) and economic activities in emerging market economies is rather a matter of empirical analysis.
- The aim of this paper is mainly to assess the dynamic response of equity prices to inflation, economic activity and monetary policy shocks as well as the responses of inflation, economic activities and short-term interest rates to equity prices shocks in South Africa as an emerging market economy.

Literature Review

- Empirical studies, in developed economies, to test whether it is relevant to central banks to include asset prices in the objective of monetary policy.
- Akram and Eitrheim (2008) argue that monetary policy can become more effective in reaching its macroeconomic objectives, including financial stability, by stabilising asset prices and/or credit market, in addition to inflation and output.
- Bernanke and Gertler (2001) recommends that monetary policy should only respond to observed changes in asset prices to the extent that they signal changes to inflation or any other indicator that monetary policy targets.
- Cecchetti, Genberg and Wadhmani (2003) argue that raising interest rates modestly as asset prices rise above what are estimated to be warranted

levels can reduce the effects of asset price bubbles on output and inflation, thus enhancing financial and macroeconomic stability.

- Equity prices are not included in the CPI basket (be it old or new CPI basket) in South Africa

Methodology

- This paper makes use of the SVEC model to mainly characterise the dynamic response
- The SVEC analysis starts from a reduced-form standard VEC model:

$$\Delta y_t = \alpha \beta' y_{t-1} + \Gamma_1 \Delta y_{t-1} + \dots + \Gamma_{p-1} \Delta y_{t-p+1} + \mu_t$$

- From Johansen's (1995) version of the Granger's representation theorem, it follows that the VEC model has the following moving average representation:

- $y_t = \Xi \sum_{i=1}^t \mu_i + \Xi^*(L)\mu_t + y_0^*$ where $\Xi = \beta_{\perp} (\alpha'_{\perp} (I_K - \sum_{i=1}^{p-1} \Gamma_i) \beta_{\perp})^{-1} \alpha'_{\perp}$ and represents the long-run effects of forecast error impulse response. Ξ_j^* contains transitory effects and has a rank $K-r$ if the cointegrating rank of the system is r . The term y_0^* contains all initial values of the vector time series. The forecast error impulse responses based on Ξ and $\Xi^*(L)$ are without economic meaning as they are obtained from the reduced-form disturbance

- Structural shocks need to be identified.
- The relationship between the reduced-form disturbances and the underlying structural shocks is written as follows:

$$\mu_t = A\varepsilon_t$$

- If the system has r cointegrating relations, $k=(K-r)$ shocks will have permanent effects, while at most r shocks will have transitory effects.
- To exactly identify permanent shocks $k(k-1)/2$ restrictions (elements of the matrix ΞA set to zero) are needed. Similarly $r(r-1)/2$ additional contemporaneous restrictions are needed to identify the transitory shocks. There are $K(K-1)/2$ restrictions in total to exactly identify matrix A .

Data and Empirical Analysis

- The specification of the VEC model includes the following variables: the Treasury bill rate (TB) to represent the short-term interest rate, The natural logarithm of manufacturing production (LNMANU) is used as an important indicator of economic activities in South Africa. The first difference of the logarithm of the consumer price index (CPIX), (DLNCPI), is used to represent the rate of inflation and the natural logarithm of the Johannesburg all-share equity indices (LNJSE) is used to represent equity prices. All the series are sourced from Quantec database.

- The results (ADF) show that all series are integrated of order one I (1).
- Two cointegrating relations or rank $r=2$ (trace and Max-eigenvalue tests)
- $y_t = (LNJSE_t, LNMANU_t, DLNCPI_t, TB_t)'$

Table 1 Weak Exogeneity test

Variable	Restriction	LR statistic	df	Probability	conclusion
LNJSE	$\alpha_{11} = \alpha_{12} = 0$	0.548361	2	0.76019	Weakly exogenous
LNMANU	$\alpha_{21} = \alpha_{22} = 0$	35.957	2	0.00000	Endogenous
DLNCPI	$\alpha_{31} = \alpha_{32} = 0$	16.84462	2	0.00022	Endogenous
TB	$\alpha_{41} = \alpha_{42} = 0$	5.976279	2	0.05038	Endogenous (10%)

Note: restriction applied for the two cointegrating equations. df is the degree of freedom that is equal to the number of restrictions. LR is the likelihood ratio statistic.

- we identify two cointegrating relations among the four variables as well as the results of the weak exogeneity test in Table 5 that revealed that LNMANU and DLNCPI are two the important adjusting variables (based on LR statistic), our theoretical model implies that LNMANU and DLNCPI shocks do not have permanent effects on the system variables.

- These restrictions are expressed by a zero column in the long-run matrix ΞA as

$$\Xi A = \begin{pmatrix} * & 0 & 0 & 0 \\ * & 0 & 0 & * \\ * & 0 & 0 & * \\ * & 0 & 0 & * \end{pmatrix}$$

Results

Figure 1 Responses of DLNCPI, LNMANU and TB to LNJSE shocks

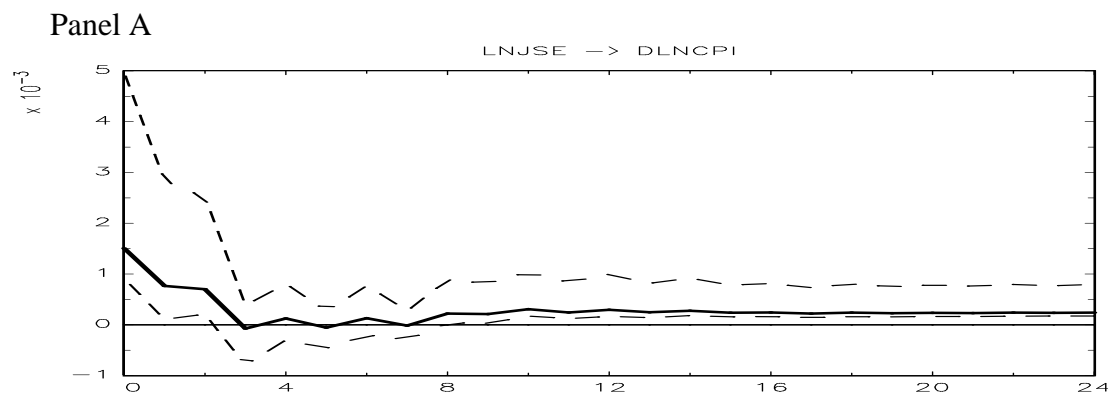
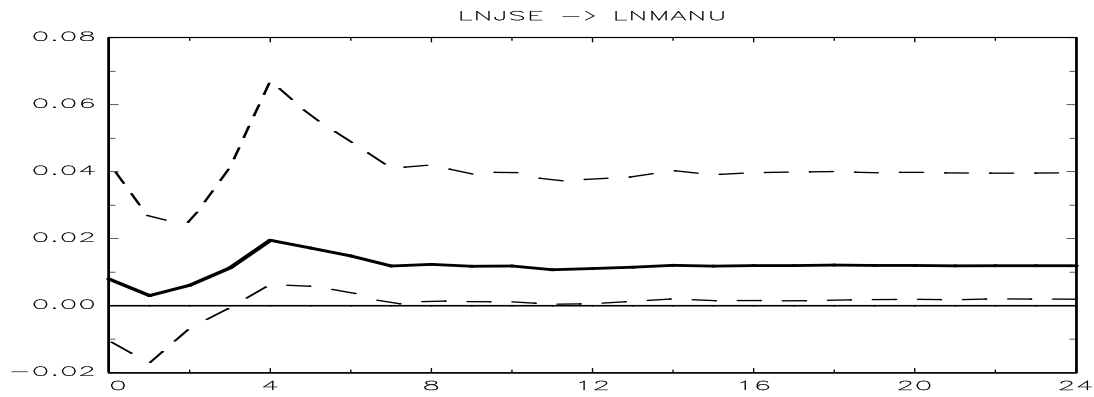


Figure 1 continued

Panel B



Panel C

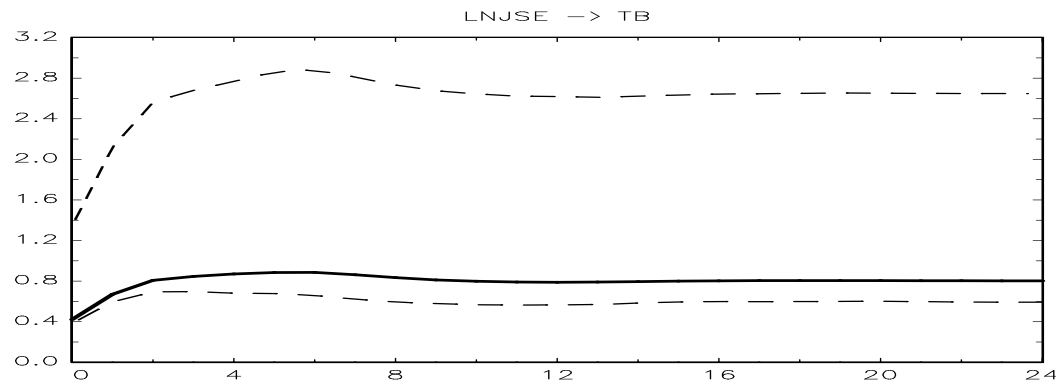
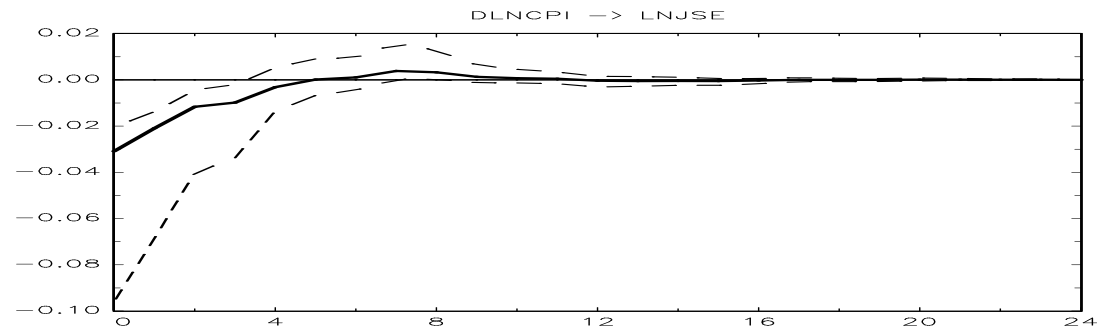
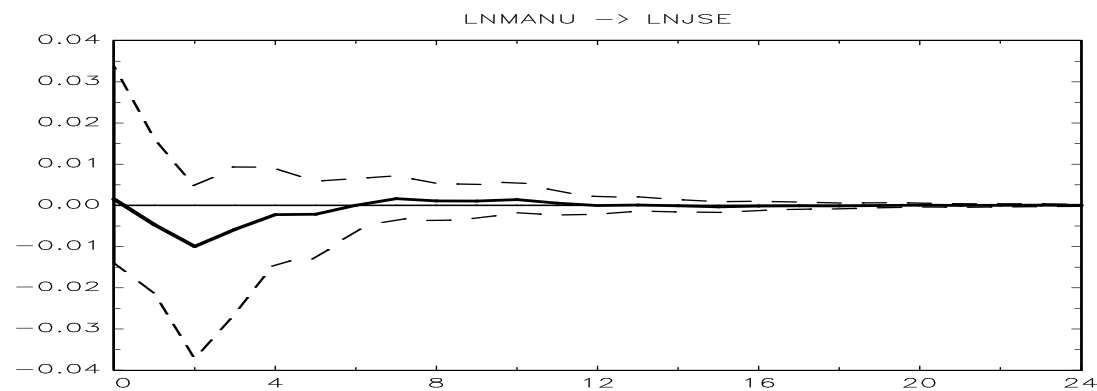


Figure 2 Response of LNJSE to DLNCPI, LNMANU and TB shocks

Panel A

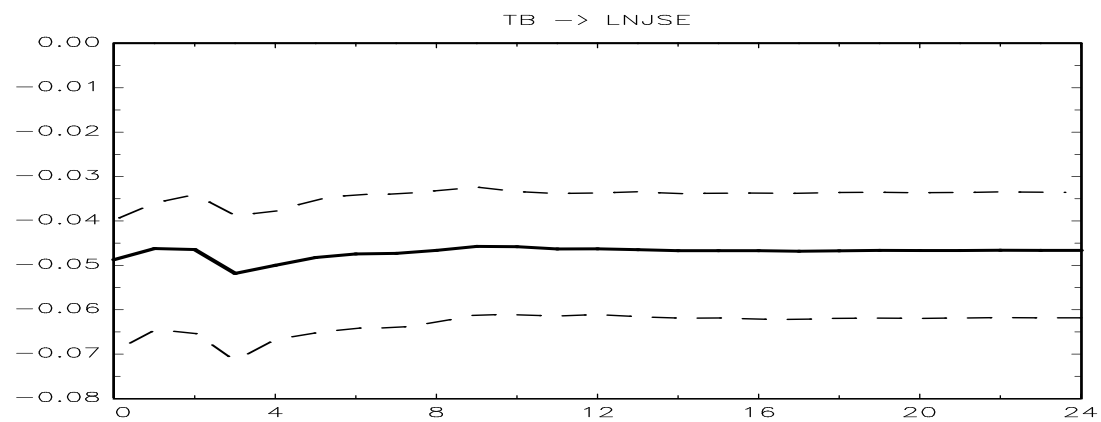


Panel B



Continued

Panel C



Note: --- represent 95% Hall bootstrap confidence intervals and solid lines represent the IRF

Conclusion

- The results of the impulse response functions show that the response of inflation to equity prices shocks is positive.
- Manufacturing production responds positively to equity prices shocks as predicted by Tobin's q ratio theory
- Short-term interest rate react positively to equity prices shocks.
- The positive reaction of the short-term interest rates to equity prices shock should be seen as a proxy effect that is the positive relationship between equity prices and short-term interest rates are induced by positive relations between interest rates and aggregate demand.
- Equity prices respond negatively to monetary policy shocks

- The implication of these findings is that although the SARB is capable to affect the equity prices by changing the short-term interest rates, the small response of inflation to equity prices indicates that the SARB will not find it important to include equity prices in its reaction function.
- Thus, the SARB should not be concerned about identifying the extent and the magnitude of the bubble in the South African equity market as long as there will be no intended reaction to equity prices.