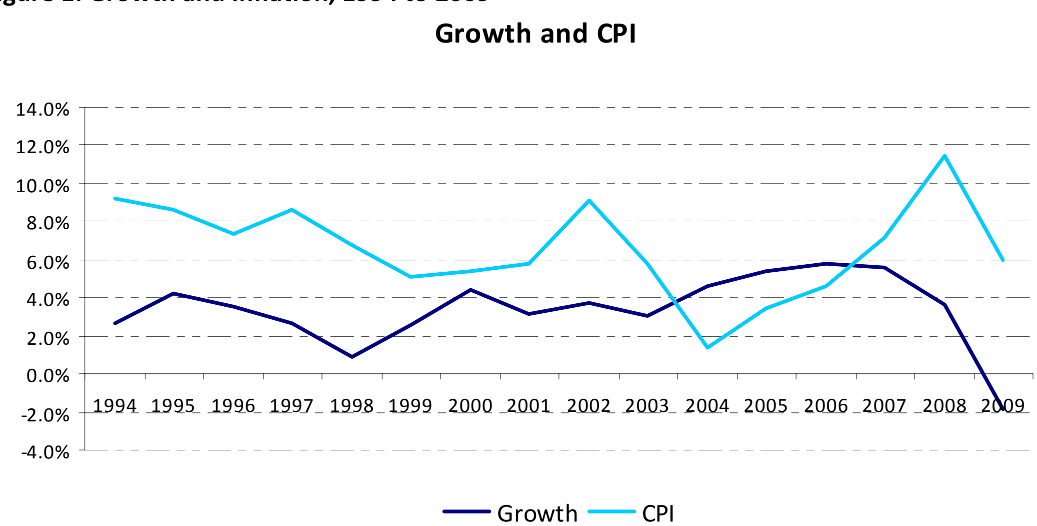
Should Exchange Rates and Asset Prices Play a Larger Role in Monetary Policy Rules?
3581 words

South Africa's monetary policy objective is the achievement and maintenance of price stability in order to ensure a macroeconomic environment which is conducive to growth. Inflation targeting was adopted in South Africa in 2000, with the target range defined as 3-6%. One of the main advantages of inflation targeting as a policy measure is its effectiveness in controlling inflation expectations and lending credibility to the monetary authority. Inflation targeting is a transparent and unambiguous monetary policy, and this boosts macroeconomic stability in its entirety.

For a cursory look at macroeconomic performance under inflation targeting, Figure 1 below plots the change in the Consumer Price Index (CPI) against GDP growth from 1994 to 2009. Growth has been stable and positive throughout this period except in 2009 when the financial market crisis caused a global recession. Inflation only breached single digits in 2008, when the world was in an asset and commodity boom cycle. It is interesting to note that over the period shown in Figure 1, the highest inflation and the lowest growth are associated with asset price movements. Overall though, inflation targeting appears to have been effective in controlling inflation with minimal negative impact on growth.

Figure 1: Growth and Inflation, 1994 to 2009



Source: SARB Quarterly Bulletin

Despite its apparent effectiveness in aiding macroeconomic stability, one of the weaknesses of inflation targeting is that it is a singular goal meaning that other prices (specifically asset prices and exchange rates) are allowed to fluctuate widely. This is what gives rise to two arguments against inflation targeting in its current form in South Africa: the first is that the South African Reserve Bank (SARB) should target the exchange rate as this will ensure low inflation and greater competitiveness. The second is that asset prices should be targeted explicitly in order to ensure a stable macroeconomic environment and minimise asset price shocks that may have a detrimental effect on growth, employment and price stability.

Monetary Policy and Targeting Asset Prices

There is a good theoretical argument for including asset prices such as stock and house prices in monetary policy rules. The argument is that asset prices contain valuable information about future consumption, and was first articulated by Alchian and Klein (1973). They theorised that traditional measures of inflation such as Personal Consumption Expenditure do not capture the full picture of the inflationary environment because they exclude important wealth effects; and asset prices are a good proxy of the excluded information. After conducting an analysis based on intertemporal consumption, Alchian and Klein (1973:1) concluded that “a price index used to measure inflation must include asset prices”. One of the most well known proponents of this theory that asset prices should be incorporated into monetary policy because of their predictive power was Charles Goodhart of the Bank of England’s Monetary Policy Committee (Filardo, 2000:1). Goodhart (2005) insisted that asset prices – and house prices in particular – contain useful predictive information about the future inflationary environment (Filardo, 2000:3).

I conducted a regression analysis of lagged asset prices on CPI in order to test whether asset prices have any predictive power on inflation in South Africa. Using monthly data from February 2000 to January 2010 from the SARB Quarterly Bulletins, I conducted a linear regression of CPI against one and two lags of the percentage change in the JSE All Share Index and in the Absa House Price Index. I used the first difference of these stock and house price indices to ensure stationarity. Augmented Dickey-Fuller tests on the data, the results of which are reported in Appendix 2, show that none of the first difference series contains a unit root, so all of them are stationary. I used the lagged difference of CPI as a control variable.

The model is overall significant, with an F-statistic of 29.57 with $^{5}/_{112}$ degrees of freedom, and an associated probability value of 0.00%. The adjusted R-squared shows the model is a fairly good fit and explains almost 55% of the variation in CPI. So lagged stock and house prices do have some predictive power of inflation in South Africa. Only the second lag of the first difference of the ABSA house price index is not significant. Table 1 below reports the t statistics and the standard errors of the variables; full results are in Appendix 1.

Table 1: Linear Regression Results

Variable	**t-statistic**	**Standard Error**
Lagged Difference of CPI	-2.25	0.7941
One lag of ALSI	4.88	0.0559
One lag of House Price Index	5.75	1.9789
Double lag of ALSI	6.01	0.0580
Double lag of House Price Index	1.03	1.7857
Constant	37.08	2.7251

Source: Author’s Regression Analysis

These results confirm that asset prices, specifically stock and housing prices, do contain valuable information about future consumption prices. They are consistent with other econometric studies that have investigated these issues, such as Goodhart and Hoffman (2000), who found that in England stock and housing prices provide useful information about future inflation.

Although stock and house prices appear to contain predictive information on inflation, there are some strong arguments against the inclusion of asset prices in monetary policy. These arguments contend that including asset prices in monetary policy rules will not improve macroeconomic performance.

Gilchrist and Leahy (2002) argue that incorporating asset prices into monetary policy will not improve macroeconomic performance because any predictive information provided by asset prices is already incorporated in output. Asset prices can affect output through various mechanisms that change the behaviour of firms, households and lenders. For instance, an increase in stock prices makes investment more attractive for firms, while at the same time it makes lenders more eager to provide funds to listed companies (Mishkin, 2007). Stock prices thus affect output through their impact on firm investment. Additionally, stock prices also have important effects on household wealth. This effect on households is similar to that of rising real estate prices. Higher stock and house prices encourage households to spend more, thus raising aggregate demand and output. So useful information contained in stock and house prices will also be contained in investment and consumption, and thus output, which is already taken into account in Taylor type monetary policy rules employed by the SARB.

In addition, Gilchrist and Leahy (2002) also point out that asset prices, and stock prices in particular, are influenced by many other factors which may not be related to future consumption and so they are a poor proxy for the price of future consumption. This means that including asset prices in monetary rules may result in inappropriate policy actions. For example, stock price volatility may be caused by fads and the behaviour of traders – factors not related to future consumption at all. This is the main argument made by van der Merwe (2004), a former economist at the SARB. Asset prices may change for reasons which are not related to future consumption, and it is difficult to establish what the cause of changes in asset prices are. Mishkin (2007) agrees, and asserts that because the cause of asset price volatility is difficult to determine, making asset prices the target of monetary policy may result in inappropriate and harmful monetary policy reactions to shocks in the economy.

Viegi (2006) reasons that monetary policy cannot provide an effective response to asset price shocks without compromising its objective of price stability. But history has shown that this is not always true. There are cases in which monetary policy authorities have to respond to asset price movements to prevent or minimise their negative effects on the real economy. This gives rise to the question to what extent monetary policy should respond to asset prices. Bernanke and Gertler (2007) provide somewhat of an answer: they contend that there are two conditions which must be satisfied before monetary authorities should concern themselves with asset prices. The first is that the asset price volatility should be due to non-fundamental factors, and the second is that this volatility should affect the real economy. These conditions were certainly met by the 2008 financial crisis. Not only was it initiated by non-fundamental factors – credit defaults – but it also resulted in a prolonged recession of the global economy, including South Africa. But asset prices undergo boom-bust cycles frequently, and it is difficult to say in advance whether they will have an impact on the economy or not.

Both theory and empirical study show that asset prices do contain valuable predictive information about consumer prices, but it seems that this information is already incorporated in output. Targeting asset prices directly may also result in harmful consequences for the economy. So, although there are certain conditions under which asset prices should be given more weight in monetary policy decisions, there is a strong case against making asset prices a permanent feature of monetary policy.

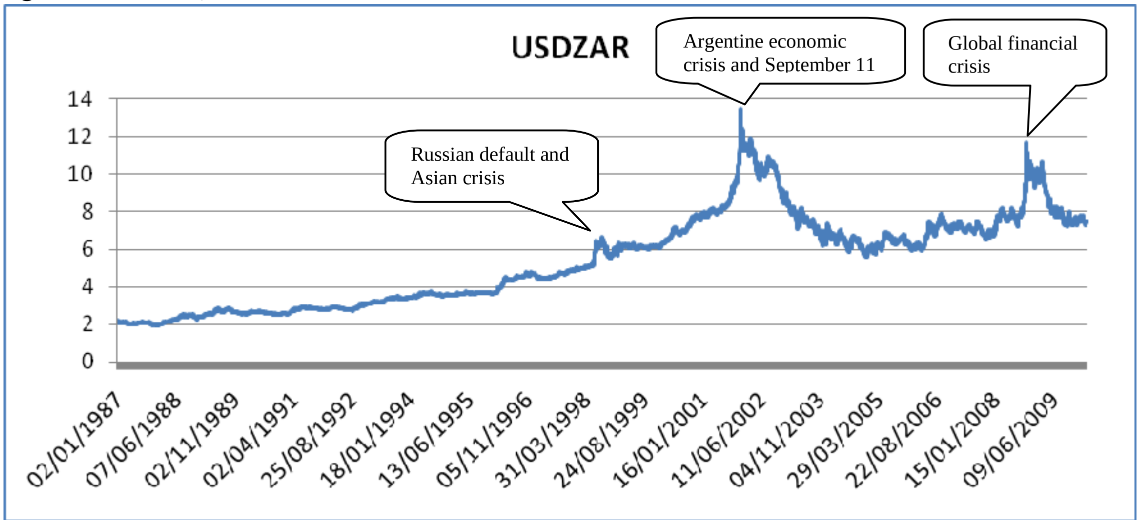
Exchange Rate Targeting and Monetary Policy

Today, the best proponents of exchange rate control are those countries that still have pegged currencies. The best known example is China, which has resisted mounting pressure from the United States and the European Union to allow the yuan to float freely. In contrast, the South African rand is flexible, and determined by market forces. According to Cosatu (2010) having a flexible exchange rate and liberalising exchange controls makes the economy unstable and domestic industries uncompetitive. With the appointment of the new SARB governor, Professor Gill Marcus, and the new left leaning government of President Jacob Zuma the debate on whether inflation targeting is the best policy for South Africa has taken centre stage in discussions on monetary policy. Recently

Cosatu has called for USDZAR to be fixed at 10.50 in order to improve competitiveness and protect manufacturing jobs (Business Day, 2010).

Mishkin (2000) notes that they may be public pressure on the monetary authority to control the exchange rate which cannot be ignored – as is true in South Africa. The mining and manufacturing sectors rely heavily on exports so a real appreciation results in poorer performance of those sectors. Figure 2 shows the USDZAR exchange rate since 1987. It fluctuated widely over the period, causing volatility in mining and manufacturing output - and this volatility is the main reason that the calls for control of the exchange rate are getting louder.

Figure 2: USDZAR, 1987 to 2009



Source: Reuters

About 40 years ago, almost every country in the world followed a fixed exchange rate regime. So in evaluating the arguments for and against exchange rate control, it is useful to begin by investigating why South Africa no longer fixes its currency. From the collapse of the Bretton Woods system – of which South Africa was a signatory – until 1979 the rand was subjected to a myriad of policies ranging from pegging to the US dollar, to the British pound, and to a basket of currencies, as well as various degrees of dirty floating depending on global economic developments (van der Merwe, 1996:2). None of these policies met with much success. In an increasingly global world – it is difficult to control exchange rates, particularly if you are a small open economy like South Africa.

But even large economies struggled to control their exchange rates. The Bank of England's abandonment of currency control in September 1992 is educational; more than USD 5 billion was spent in one day trying to prevent the collapse of the pound due to speculation. This case illustrates that exchange rate control makes a country vulnerable to speculative attack, and so requires keeping and sometimes expending large amounts of reserves. Therefore, an important consideration for the SARB in this monetary policy debate is if South Africa has the required reserves to implement a fixed exchange rate regime.

These two examples are not unique. They demonstrate that maintaining a certain exchange rate is difficult and costly. This partly explains why many countries have abandoned exchange rate control. Obstfeld and Rogoff (1995) compare different types of exchange rate regimes and conclude by stating some additional reasons why many economies have deserted exchange rate control. They argue that the main disadvantage of exchange rate management is that the government loses the ability to use monetary policy to react to developments in the domestic economy. For instance, if output is under downward pressure a monetary authority whose main aim is exchange rate control may not be able to ease rates as this could jeopardize the maintenance of the target currency value.

Van der Merwe (1996) agrees that fixing the exchange rate necessitates the abandonment of monetary policy as a tool to manage the domestic economy. But this argument has been proven fallible by countries such as Hungary, who today continue to pursue a hybrid monetary policy which includes some form of exchange rate fixing while still retaining control of monetary policy as a domestic tool. Hungary follows inflation targeting and some form of crawling peg and has had success in controlling output and domestic inflation as well as its exchange rate. In Hungary the inflation goal carries substantially more weight than the exchange control goal. This shows that the goals of inflation and exchange rate control can be pursued concurrently, and with success, so long as the exchange rate target is of secondary importance to the inflation target.

With regard to hybrid monetary policy such as that implemented in Hungary, Mishkin (2000) cautions that anchoring monetary policy on exchange rates is a mistake. He cites New Zealand and Chile as examples – their hybrid policy prioritised exchange rate stability over the inflation target. This resulted in the wrong policy response when a terms of trade change caused a depreciation of the respective currencies. The culmination was an undershooting of the inflation target in both cases and a protracted recession in both economies. So focusing on the exchange rate may result in costly policy mistakes.

But this does not mean that monetary authorities should disregard the exchange rate. In his review of inflation targeting during the 1990s, Mishkin (2000) highlights that exchange rates are particularly important for small open economies, and should not be ignored by monetary policy authorities. Van der Merwe (2004) affirms this view and points out that in developing economies such as South Africa exchange rates have a greater impact on output, inflation, and competitiveness. In small open economies, exchange rates have even more importance if the country has a huge amount of foreign debt. In that case a large unexpected depreciation of the currency may lead to financial crisis. The Hungarian approach worked precisely because exchange rates were still an important objective of monetary policy, secondary only to the inflation target. South Africa has a sizeable amount of foreign debt, and a current deficit deficit; so the value of the rand is of great importance for macroeconomic performance.

But although exchange rates are important, price stability is of greater importance in developing economies. Recent growth studies have shown that there is an inverse relationship between inflation and growth (Bruno and Easterly, 1955). This implies that discarding price stability as the main goal of monetary policy may compromise growth. An important argument against exchange rate targeting stems from this relationship. It is that the implementation of an exchange rate target necessitates discarding the goal of price stability, with the consequence of harming growth.
<Link?>
Kamin (1997:page?) claims that there is a trade off between price stability and export competitiveness in the short and medium term. He states that although it is well known that changes in the nominal exchange rates lead to changes in the inflation rate – it is less widely understood that a depreciation in the real exchange rate may lead to a 'sustained increase' in inflation. Because weak exchange rate levels are associated with higher competitiveness, the existence of an inverse relationship between exchange rate levels and inflation rates would suggest that low inflation and competiveness are conflicting goals when exchange rates are used as a policy measure. Kamin (1997) estimates a regression equation for inflation and finds that the coefficient for the real exchange rate is highly significant and negative even after controlling for other factors. Kamin's (1997) study was based on a sample of developing countries in Asia and South America, most of which are similar to the South African economy. His empirical analysis lends support to the

view that in monetary policy there is a conflict between maintaining price stability and influencing the exchange rate to aid competitiveness.

One of the ways in which governments attempt to influence exchange rate without affecting price stability is through sterilised intervention. This occurs when monetary authorities sell forex reserves and simultaneously purchase domestic bonds in order to boost a currency. Obstfeld and Rogoff (1995:4) call this strategy "smoke and mirrors" and show that it has little or no effect on either exchange or interest rates because it has no impact on money supply. <LINK?> To assess whether monetary policy can influence the exchange rate, I conduct some empirical analysis to gauge the impact, if any of conventional monetary policy tools on the exchange rate. My model tested whether the repo rate or money supply have any effect of the nominal effective exchange rate in South Africa.

I employed monthly data from the SARB Quarterly Bulletins ranging from the beginning of 2000 to January 2010 in a trivariate structural vector autoregression (SVAR). The model is just identified with three contemporaneous restrictions: (1) money supply is not affected by the repo rate; (2) money supply is not affected by the exchange rate; and (3) the repo rate is influenced by money supply but not by the current exchange rate. I used first differences of the money supply and exchange rate series to ensure stability of the SVAR system.

These restrictions give rise to three structural equations which can be described by these vectors:

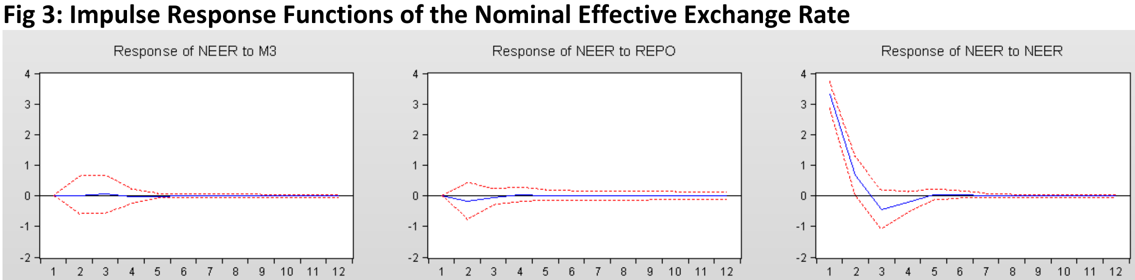
$$\begin{pmatrix} 1 & 0 & 0 \\ \beta_{21} & 1 & 0 \\ \beta_{31} & \beta_{32} & 1 \end{pmatrix} . \begin{pmatrix} m_t \\ r_t \\ x_t \end{pmatrix} = \begin{pmatrix} c_1 \\ c_2 \\ c_3 \end{pmatrix} + C(L) \begin{pmatrix} m_{t-1} \\ r_{t-1} \\ x_{t-1} \end{pmatrix} + \begin{pmatrix} \gamma_{11} & 0 & 0 \\ 0 & \gamma_{22} & 0 \\ 0 & 0 & \gamma_{33} \end{pmatrix} . \begin{pmatrix} u_1 \\ u_2 \\ u_3 \end{pmatrix}$$

Where r_t is the repo rate, x_t is the NEER and m_t is the inflation rate, all at time t and c is the constant and u is the error term and C(L) is a lag polynomial matrix

I estimated the above SVAR system after testing for stationarity and finding it to be stable. A graph showing the stability tests is in Appendix 4. I generated an impulse response functions from the SVAR estimation results.

As can be seen from the impulse response function below, neither the repo rate nor money supply has a lasting effect on the nominal effective exchange rate. The impulse response functions depict the influence of monetary policy instruments on the exchange rate over ten months. Full results of the VAR are in Appendix 3.

Fig 3: Impulse Response Functions of the Nominal Effective Exchange Rate



Source: Author's SVAR Analysis

This result is not entirely unexpected. In today's increasingly global world, it is difficult for any one country to influence its exchange rate – particularly for a small open economy such as South Africa.

As evidenced by newspaper reports there are very loud calls and strong arguments for the SARB to include the exchange rate into monetary policy rules. But as with the inclusion of asset prices, there are strong reasons not to make exchange rate the anchor of monetary policy. History shows us that maintaining any form of fixed exchange rate regime is not only difficult, but also quite costly both in terms of required reserves and the increased probability of policy mistakes. However, some developing countries have been able to incorporate exchange rate control into monetary policy rules with success. South Africa may benefit greatly from some form of limited exchange control within the inflation targeting framework.

Conclusions

This short paper has evaluated for the arguments for the inclusion of both asset prices and exchange rates in monetary policy rules. Although asset prices and exchange rates both have important effects on the economy, there are valid arguments against either of them playing a larger role in monetary policy. The SARB has in the past reacted to both asset prices and exchange rates when they had large and clear effects on the real economy. The current policy of inflation targeting, which does give due consideration to exchange rates and asset prices, has yielded great benefits for the South Africa economy – today we enjoy both macroeconomic and price stability and growth.

It is not clear that including asset prices in monetary policy rules will improve South Africa's macroeconomic performance. In respect of targeting asset prices. After evaluating the arguments and conducting some empirical analysis, this short paper concludes that the current SARB policy – which gives due consideration to asset prices when necessary - is indeed the most appropriate monetary policy for South Africa.

The issue of controlling the exchange rate is not so clear cut. South African is a small open economy with a sizeable current account deficit and a fair amount of foreign debt. This means that it is highly susceptible to movements in the exchange rate. Furthermore, the mining and manufacturing sectors contribute substantially to employment and output and are heavily affected by changes in the exchange rate. Hybrid policies that target both inflation and the exchange rate have had success in some developing countries. Although it is difficult and costly to implement exchange controls, there is a strong case to having exchange rates play a larger role in monetary policy. It is likely that pursuing exchange control while maintaining inflation targeting as the main goal will result in better macroeconomic performance. In respect of targeting exchange rates, this short paper concludes that further research needs to be conducted into hybrid monetary policy to determine whether the twin goals of inflation and exchange control can be pursued concurrently and successfully in South Africa.

Word Count: 3581 (excluding figures and the SVAR vector)

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ECONOMETRIC ANALYSIS APPENDICES

APPENDIX 1: LINEAR REGRESSION ON CPI (Stata)

```
. xi: reg  cpi ld.cpi l.alsi l.absahousepriceindex ll.alsi ll.absahousepriceind
> ex
```

Source	SS	df	MS
Model	17783.2143	5	3556.64286
Residual	13472.9987	112	120.294631
Total	31256.213	117	267.14712

Number of obs =	118
F(5, 112) =	29.57
Prob > F =	0.0000
R-squared =	0.5689
Adj R-squared =	0.5497
Root MSE =	10.968

cpi	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
cpi						
LD.	-.1788339	.0794139	-2.25	0.026	-.3361823	-.0214855
alsi						
L1.	.272928	.0558889	4.88	0.000	.1621914	.3836646
absahousep~x						
L1.	11.36165	1.97887	5.74	0.000	7.440779	15.28253
alsi						
L2.	.3487202	.0579944	6.01	0.000	.2338117	.4636286
absahousep~x						
L2.	1.833684	1.785735	1.03	0.307	-1.70452	5.371888
_cons	101.0389	2.725085	37.08	0.000	95.63951	106.4383

APPENDIX 2: DICKEY FULLER TESTS FOR A UNIT ROOT (Stata)

```
. dfuller absahousepriceindex, lags(2)
```

Augmented Dickey-Fuller test for unit root Number of obs = 117

	Test Statistic	Interpolated Dickey-Fuller 1% Critical Value	5% Critical Value	10% Critical Value
Z(t)	-6.086	-3.504	-2.889	-2.579

MacKinnon approximate p-value for Z(t) = 0.0000

```
. dfuller alsi, lags(2)
```

Augmented Dickey-Fuller test for unit root Number of obs = 117

	Test Statistic	Interpolated Dickey-Fuller 1% Critical Value	5% Critical Value	10% Critical Value
Z(t)	-9.430	-3.504	-2.889	-2.579

MacKinnon approximate p-value for Z(t) = 0.0000

```
. dfuller cpi, lags(2)
```

Augmented Dickey-Fuller test for unit root Number of obs = 117

	Test Statistic	Interpolated Dickey-Fuller 1% Critical Value	5% Critical Value	10% Critical Value
Z(t)	-7.660	-3.504	-2.889	-2.579

MacKinnon approximate p-value for Z(t) = 0.0000

APPENDIX 3: STRUCTURAL VAR ESTIMATION (Eviews)

Structural VAR Estimates
Date: 04/27/10 Time: 14:28
Sample (adjusted): 2000M04 2010M01
Included observations: 118 after adjustments
Estimation method: method of scoring (analytic derivatives)
Convergence achieved after 19 iterations
Structural VAR is just-identified

Model: Ae = Bu where E[uu']=I
Restriction Type: short-run pattern matrix

A =

1	0	0
C(1)	1	0
C(2)	C(3)	1

B =

C(4)	0	0
0	C(5)	0
0	0	C(6)

	Coefficient	Std. Error	z-Statistic	Prob.
C(1)	-4.24E-05	0.000138	-0.306248	0.7594
C(2)	0.112897	0.103399	1.091858	0.2749
C(3)	24.82450	68.79707	0.360837	0.7182
C(4)	2.928925	0.190657	15.36229	0.0000
C(5)	0.004400	0.000286	15.36229	0.0000
C(6)	3.288466	0.214061	15.36229	0.0000
Log likelihood	-129.3032			

Estimated A matrix:

1.000000	0.000000	0.000000
-4.24E-05	1.000000	0.000000
0.112897	24.82450	1.000000

Estimated B matrix:

2.928925	0.000000	0.000000
0.000000	0.004400	0.000000
0.000000	0.000000	3.288466

APPENDIX 4: VAR STABILITY TEST (Eviews)