Monetary Policy Shocks in a Small Open Economy: Assessing the 'Puzzles' of Monetary Policy by SVAR

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I. Introduction

Much of the controversy in macroeconomics has been generated by the discussion over the qualititative and quantitative effects of monetary policy on macroeconomic variables (output, price level and the value of domestic currency: exchange rate) as the disagreement remain among economic mainstreams of Keynesianism versus Monetarist views this paper selectively and briefly reviews the theory and presents evidence on the monetary policy effects for the small open economy of Korea using quarterly data then the paper introduces the empirical evidence suggested by the adopted modelling strategy for assessing the magnitude and persistence of monetary policy shocks in a small open economy.

The paper consists of four sections and proceed as follows, the next section selectively and briefly reviews the theory and evidence on the effects of monetary policy in the context of the literature, previous research is selected such that motivation for this paper's modelling strategy is fulfilled, with an emphasis on the previous attempts providing influential empirical evidence that is consistent or contradictory with empirical findings of this paper. The third section introduces the modelling strategy that aims to critically evaluate the 'monetary policy' shock distinguishing it from a shock in the monetary aggregates (shock in money stock) or just a 'monetary' shock, the modelling strategy describes the motivation behind the specification of the VAR model providing justifications for inclusion and exclusion of variables and restrictions suggested by economic theory or by a specific economic model, it will also explain the identification scheme of monetary policy and the likely effects of monetary contraction and the occurrence of puzzles, the last section shows the statistical tests results of the model, summarises empirical findings, evaluates the approach performed in the paper and conclude.

II. Literature Review

The effectiveness of monetary policy in the debates of the 1960's and 1970's between Keynesian designed models and the monetarists views on the other hand focused on the relative size of certain elasticises and parameters where IS-LM framework is used to assess macroeconomic policy as the authorities can stabilise the economy by controlling the money stock (increasing money and shifting LM to the right), however prices cannot be assumed to be constant and in what sort would the mechanism to increase output is like (how would labour input change to increase income), introducing expectations would yield different conclusions on effectiveness of monetary policy, Shortcomings of models of all these models inspired a new macroeconomic modelling strategies in the last two decades.

This paper constructs a dynamic VAR and employs impulse response functions analysis; the objective of these exercises is to investigate -in an empirical fashion- the impact of monetary policy shocks. The modelling strategy is based on the developments in the macroeconometric modelling in the last two

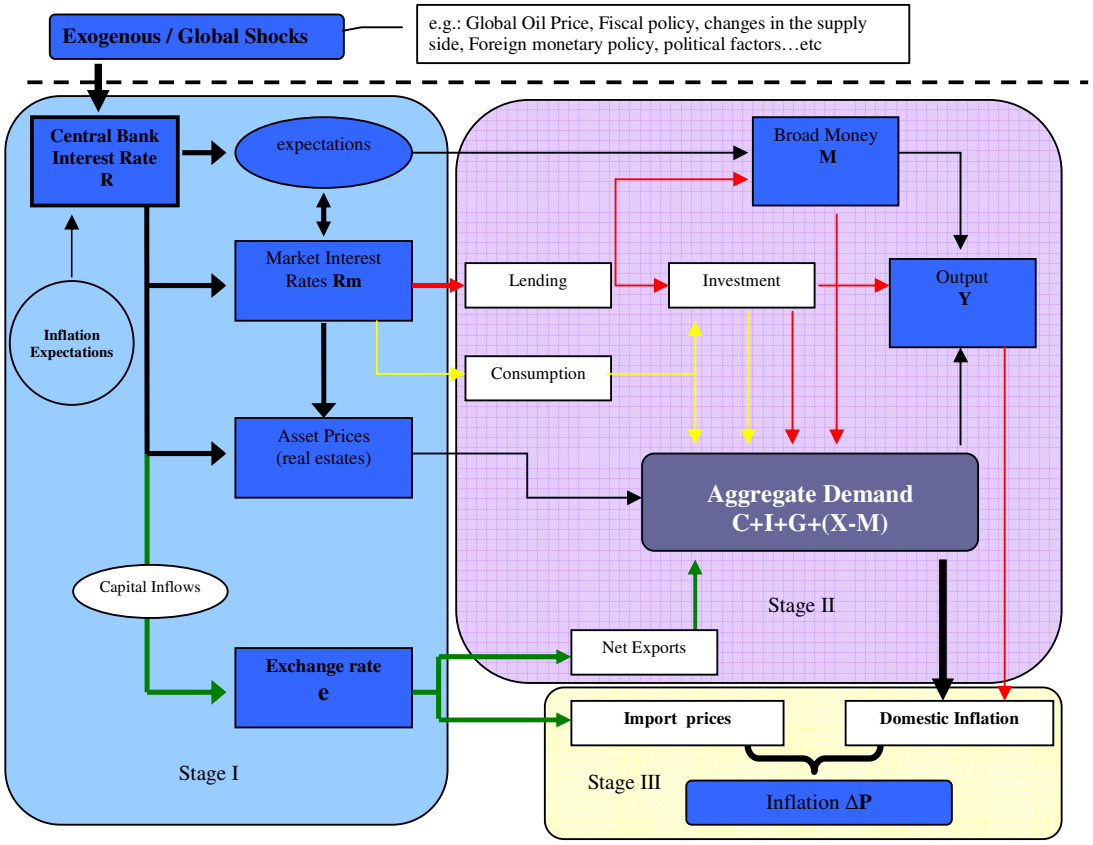
decades as in the influential papers on long run macroeconometric modelling as in King et al (1991), Gali (1992), Mellander et al (1992) all for a large country case. As the developments in the modelling strategy of the VARs is quite interesting, the literature and previous research on identified VARs is albeit huge and an ideal full review of the literature with legitimate emphasis on how identification of VARs developed is out of this paper scope, instead the I summarise some of the most commonly quoted papers in the literature that are most relevant to what this paper is aiming for. In a closed economy setting, for monetary policy effects Leeper, Sims and Zha (1996) provides empirical evidence on the effects of monetary policy shocks, also Christiano, Eiechenbaum & Evans (1996) using different measures of monetary policy shocks show a decline in the price level for the US. In an open economy context, an influential paper by Eiechenbaum & Evans (1995) for the large countries case where the model consist of the US and the rest of the G7 each as a foreign country, also using several measures Eiechenbaum & Evans (1995) show that a US contractionary monetary policy shock leads to a significant persistent appreciation in both real and nominal exchange rates in a non contemporaneous effect consistent with Dornbusch (1976) model of overshooting, the other main finding was a persistent significant deviation from Uncovered Interest Parity UIP in response to a contractionary monetary policy shocks, concluding with doubts on the empirical validity of RBC literature. Models of the US as the largest economy with assumptions that the monetary policy reacts contemporaneously on exchange rate fluctuations might not be suitable for other countries smaller and much more open than the US, Kim & Roubini (1997) attempted an identification scheme based on triangular Choleski matrix decomposition with over-identified restrictions that considers money supply and demand functions in an over identified VAR, their most significant contribution to the literature was providing a generic specification for a non-US country. In the literature so far there has been little effort for modelling monetary policy in a small open 'developing' Economy the motivation of this paper is to construct a macroeconometric model and identification scheme to estimate the effects of monetary policy shocks on macroeconomic aggregates activity, in the previous attempts several empirical findings introduced the so called 'Puzzles' in which the paper tries to investigate for a smaller and more open economy with successful integration into the global economy and high growth in output, the strategy for defining a monetary policy shock is inspired by Sims (1992) distinguishing between a money stock shock and a monetary policy shock and emphasising the importance of interest rate in generating aggregate and income fluctuations, in another paper Kim & Roubini(2000) outline the likely effects of monetary contraction and anomalies 'Puzzles' in monetary policy in a small open economy context.

III. Background and Theoretical Motivation of the model

III.I The Structural view: Monetary policy Transmission Mechanisms

The transmission mechanism of monetary policy takes three major channels; the credit channel (red), the interest rate channel (yellow) and the exchange rate or the Balance of Payments channel (green), these channels of the transmission mechanism take some time to have its full effect on inflation and the economy, since financial sectors may react immediately, the firms and individuals and the general spending needs time to react, these stags are generally stylised as three stages shown in Figure 1.

Figure 1: Illustration of the multi-channel monetary policy transmission mechanisms



The most instantaneous effects of setting an interest rate or when there is a monetary policy shock occurs on the market interest rates, exchange rates and asset prices (houses), and more importantly in a small open economy the effect on the exchange rate due to the capital flows and the appreciation or depreciation consequences (if the interest rate increase funds flowing from the external sector the exchange rate appreciates) although it is not directly instant effect but it would occurs before this change in the exchange rate would effect the price of imports and exports that need some time to take its course, in a more abstract sense the interest rate changes would have direct effects on the demand for domestic

currency which would determine the exchange rate, at an appropriate time lag the exchange rate is viewed as the most endogenous variable.

The money and credit channel takes the form of instant response from the financial institutions changing the market interest rate directly affecting their lending and loan rates at the first stage and this has serious implications on investment levels of the firms and on the decision to hold liquid money and by that the interest rates of the economy that are all rooted to the central bank official rate would determine the money supply of the economy, another close channel is the interest rate channel as market interest rates is influencing the consumption decisions and patterns of individuals, and the investment decisions of the firms this would take some time of course and is regarded as a second stage effect time-wise, Consumption and Investment as two major components of the aggregate demand drives the output and more explicitly the domestic inflation eventually.

On the expectations mechanism, all these effects instantly forms different incident-related expectations that might be interpreted in many opposite-to-each-other ways, an increased interest rate could be seen as an attempt to reduce the heat of the booming economy to avoid inflation in other circumstances the raise in the interest rate could be seen as a negative indicator for an economy going into a recession. Changes in the global economy as in global Oil price hikes are indeed an important factor in the analysis of a small open economy, the foreign monetary policy of the main trading partner is also of great consequence directly on the interest rate as well as on any of the domestic macroeconomic variables, especially after a time lag, exogenous shocks outside the control of the Central Bank include also the domestic factors of changes in the supply side, the real side of the economy, fiscal policy and other factors.

III.II The likely 'reduced-form' effects of monetary Contraction

When estimating the effect of monetary policy shocks the structural specification guided the multi-equation system estimated by a constrained VAR but as a hypothesis we need to frame a likely outcomes of a change in the monetary policy by looking at the last, full effects of raising the interest rate on money, output, exchange rate and most importantly the price level, since we don't know exactly the nature of the inter-related transmission mechanism.

On output and price level the most basic and direct effect of the monetary policy contraction would be a rise in interest rate and monetary aggregates decline, at the same time economic theory suggest price level to decline contemporaneously as Output remains constant then both prices and Output increases after contraction if the monetary contraction is absolutely exogenous not in response for an oil shock or a foreign policy shock, this fact makes interpretation of coefficients more difficult. In a Keynesian notion

within the sticky prices, such sluggishness would expect the contractionary policy to reduce the price level as most theoretical and GE models suggest.

The effects on the exchange rate; a rise in interest rate would yield to an appreciation of the exchange rate but the if the expected inflation is high then an increase in the interest rate would depreciate the exchange rate as described in Kim & Roubini (2000), most models of the exchange rate suggest that the effect of a positive innovation in the money stock would decrease the nominal interest rate and a depreciation in the domestic currency this outcome is suggested by flexible price models as well as in overshooting models Dornbusuch (1976).

IV. Econometric Formulation: modelling the Short run Identification Scheme

In model specification this paper explicitly follows Kim & Roubini (1997)(2000) and it relies on Garratt et al (2003) in the rationalisation behind defining the monetary policy shock, specification of the model contradicts Cochrane (1998) in defining monetary aggregates shocks as a shock in monetary policy.

Specification of the VAR and the macroeconomic variables included relied heavily on the data limitation, attracted mainly by the aim towards having a long time series quarterly data, on the other hand considerations of specific country conditions also played a vital role in determination of the variables, generally decisions on modelling strategy incorporated several 'tough choices' for specification. In this model we assume that the central Bank of Korea reacts to changes and shocks in the domestic economy and abroad by setting the Central Bank rate, the Korean economy is expected as a small open economy to be affected by the G7 economies, most of which (US, Japan namely) are the persistent major trading partner in both exports and imports, the foreign sector in the model is assumed to consists out of the G7 countries weighted as their relative trading activity.

IV.I VAR specification and Identification

The core basic unrestricted VAR is given by $Y_t = \sum_{i=1}^{p} \mathbf{A}_i Y_{t-i} + \upsilon_t$

Where the vector Y_t is specified of the logs of the variables as follows (y , p , m , r , y^*, p^*, m^*, r^* Θ) are output, Consumer price Index, money supply and the interest rate respectively the starred variables refers to the foreign variables defined as G7 group countries, Θ is the average price of crude oil in terms of US $ its included as a globally exogenous variable affecting both G7 group and Korea as a main importer, s is the Korean WON (domestic currency) in terms of US $, the importance of the ordering of these variables is not important as long as the VAR is unrestricted, in the SVAR discussed further below, the ordering is crucial.

The over parameterised VAR serves as the basis of the following Structural VAR SVAR, given by adding the identification matrices of A_0, β and by imposing identifying restrictions on the dynamic matrix of the lagged coefficients A_i, the SVAR augmented by an exogenous time trend, is given by :

$$\mathrm{A}_0 Y_t = \sum_{i=1}^{p} \mathrm{A}_i Y_{t-i} + \delta t + \beta v_t$$

The feedback restrictions on the coefficients of the matrix A_i are given as follows:

$$\mathrm{A}_0 = \begin{bmatrix} 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ \alpha_{21} & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ \alpha_{31} & \alpha_{32} & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \alpha_{42} & \alpha_{43} & 1 & 0 & 0 & 0 & 0 & 0 & 0 \\ \alpha_{51} & 0 & 0 & \alpha_{54} & 1 & 0 & 0 & 0 & 0 & \alpha_{510} \\ \alpha_{61} & \alpha_{62} & \alpha_{63} & \alpha_{64} & \alpha_{65} & 1 & 0 & 0 & 0 & 0 \\ \alpha_{71} & \alpha_{72} & \alpha_{73} & \alpha_{74} & \alpha_{75} & \alpha_{76} & 1 & 0 & 0 & 0 \\ \alpha_{81} & \alpha_{82} & \alpha_{83} & \alpha_{84} & \alpha_{85} & \alpha_{86} & \alpha_{87} & 1 & 0 & 0 \\ \alpha_{91} & \alpha_{92} & \alpha_{93} & \alpha_{94} & \alpha_{95} & \alpha_{96} & \alpha_{97} & \alpha_{98} & 1 & 0 \\ \alpha_{101} & \alpha_{102} & \alpha_{103} & \alpha_{104} & \alpha_{105} & \alpha_{106} & \alpha_{107} & \alpha_{108} & \alpha_{109} & 1 \end{bmatrix}, \quad Y = \begin{bmatrix} poil \\ y^* \\ p^* \\ m^* \\ r^* \\ y \\ p \\ m \\ r \\ s \end{bmatrix}$$

The only way for identifying a VAR is achievable only if we are willing to restrict the structural or the so called primitive system, the reason is clarified by the number of parameter estimated in the VAR and in the Structural SVAR, in the SVAR part of the feedback coefficients are restricted, leaving always a number of P more parameters, where P denotes variables in the VAR (P=10) in a VAR with n variables there is $(n \times n) - n$ feedback coefficients and a $n \times n$ Auto-regressive coefficients, so in the unrestricted VAR we have 90 feedback coefficient and 100 auto-regressive coefficient which makes the interpretation of the model estimation results quite vague.

The restrictions on the matrix A_0 are derived from economic theory and from the motivation of including variables in the model (we don't assume that an output of small open economy as Korea is explaining the output of the G7). In our model specification we are allowing the exchange rate to be determined by all the foreign and domestic macroeconomic variables as the most endogenous variable, this is to incorporate the monetary approach to the exchange rate. Simultaneous feedback on Output of G7 are assumed to be just with the oil price, on the other hand contemporaneous movements in foreign output has an impact on foreign prices, same with foreign money balances but with imposing a zero restriction on oil prices, the weighted interest rate of the G7 is albeit difficult to interpret even though its allowed to have a contemporaneous effects with oil prices, as a representation of the global effect of Oil

prices on the world leading economies, the weighted interest rates of the G7 reflect the common trends of foreign monetary policies and its relevance t the Korean economy, for example it is very misleading to treat a Japanese monetary shock equally with an Italian monetary shock considering the trade volume between Korea and Japan, and the dependence of Korea on the much larger Japanese economy, interest rates also have a feedback on foreign money as suggested by economic theory and moreover a contemporaneous effect with the Korean exchange rate.

The domestic interest rate has contemporaneous relationship with domestic output, price level and money supply in order to assess the effects of monetary policy shock on these domestic variables which are often targeted by policy, its also have feedback relationship with the counterpart foreign variables additional to a contemporaneous possible effect of foreign interest rate, this is motivated due to the relatively high capital mobility the Korean economy have witnessed in the last two decades.

Regarding the auto-regressive coefficients matrix, the identification scheme impose restrictions to assure the matrix is diagonal, where diagonal coefficients are

Identification scheme here is also based on the Choleski triangular matrix decomposition, however Some elements under the principal diagonal are set to zero in order to allow for simultaneous feedback between demand and supply for money and central bank behaviour and the exchange rate, the model is over-identified, the over identification restrictions of the model are tested and rejected. Instead this paper due to limits in scope would perform the generalised impulse response functions of the unrestricted VAR which brings a massive question on the identification of policy shocks that would not be analysed appropriately with any strong robust empirical evidence.

IV.II Construction of foreign Data series

The foreign series were constructed using the weights based on direction of trade as follows

$$Y^* = \sum_{i=1}^{N} \omega_{it} Y_i \qquad P^* = \sum_{i=1}^{N} \omega_{it} P_i \qquad M^* = \sum_{i=1}^{N} \omega_{it} M_i \qquad r^* = \sum_{i=1}^{N} \omega_{it} r_i$$

Where Y^*, P^*, M^*, r^* are output, Consumer price Index, money supply and the interest rate respectively, i refers to the country specified, N is total number of the foreign countries, as defined earlier this means the G7 countries (US, UK, Canada, France, Germany, Italy and Japan) as well as treating all other trading partners as 'others' to capture the relative importance of the G7 group for the Korean economy. However the weights are defined as the relative importance of trade with any given country of the G7 compared to the total Korean international trade as in the equation below:

$$\omega_t = \frac{EX_{it} + IM_{it}}{\sum_{i=1}^{W} EX_{it} + IM_{it}}$$

Where EX_i are total exports of good and services, ω is the weight based on the ratio of the trade volume for the trading partner to the aggregate foreign trade volume (Exports + Imports). Where t =1980, 1985, 1990, 1995.

Weights are allowed to change every 5 years in order to capture the change in the international trade pattern of Korea, Table 2 shows the weights for G7 countries at different years. The motivation behind such a weighting arrangement is to emphasise the importance of the dynamic structure of Korea's exports and its dramatic change through out the last two decades as the more inelastic the exports of a given country the more it is affected by supply and demand shocks in the main trading partners. The weights for foreign variables are constructed using the values of the years 1980, 1985, 1990 & 1995 respectively data on directions of exports and imports are taken from International Trade Statistics Yearbooks. As in many other specification aspects of this paper data limitations determined constructing weights to start at 1980, however this is also consistent with the view that the shift from the typical pattern of trade of developing countries (specialisation in exporting primary inelastic products) for Korea and most developing countries changed considerably starting from 1980 to multi-sector manufactured goods and services, Using such an aggregation by constructing weights based on trade inflows with G7 could be difficult to interpret as the G7 countries themselves are of different sizes and it could be argued that the US and Japan interest rate innovations are exogenous to as the biggest two economies in the world and south Korea's major trading partner, in the same sense the Federal rate fund of the US could also be regarded as a globally exogenous variable for the Korean Economy, this variable could reflect foreign monetary policy more explicitly as in the specification of Kim & Roubini (1997).

V. Empirical Results

V.I Hypothesis testing and lag order selection of the Unrestricted VAR

Determining (p) the order of the VAR is of vital importance in an empirical analysis since the estimation of the coefficients is by OLS we need to ensure that VAR order is high enough to ensure the asymptotic theory assumptions of the OLS (to make sure that the disturbances are not serially correlated and are more like a normally distributed white noise), also it is known in the literature of applying VARs that exaggerating the number of the lags in the system would carry-over too much information and leads to the for this purpose we use Akaike Information Criterion (AIC), Schwarz Bayesian Criterion (SBC), the

log-likelihood ratio statistic all based on the Log Likelihood calculated at each lag order, Starting from the maximum lag length of 6, it is often that different criterions lead to different choices of (p) lags (the SBC often in practice results selection of lower lags) in the test for the order of a VAR its always up to the modelling strategy adopted to decide, since 4 lags from economic theory perspective is preferable (4 lags=one year), the empirical results suggest adopting a lag order of one as the AIC, SBC, HQIC and the FPE all support the lag order of one, while the LR test is significant for all lags, as shown in Table 1, then it is of convenience to select a lag order of one as it is empirically supported and would make the analysis more simple by reducing the dynamics of the model.

Table 1: Lag order Selection Criterions for the unrestricted VAR

Lag	LL	LR	p-value	FPE	AIC	HQIC	SBC
0	439.719	-	0.000	7.40E-16	-6.45721	-6.27795	-6.01605
1	2041.52	3203.6	0.000	**6.9e-26***	**-29.5618***	**-28.4863***	**-26.9149***
2	2132.11	181.17	0.000	8.20E-26	-29.417	-27.4452	-24.5643
3	2225.85	187.48	0.000	9.70E-26	-29.3207	-26.4526	-22.2622
4	2321.94	192.2	0.000	1.20E-25	-29.2607	-25.4963	-19.9963
5	2408.2	172.52	0.000	1.80E-25	-29.0493	-24.3886	-17.5792
6	2511.36	**206.3***	0.000	2.50E-25	-29.0978	-23.5408	-15.4219

*** Bold** values Indicates the lag length selection decision for the specified criterion
* Degrees of Freedom = 100.

LL: the Log Likelihood statistic. **LR**: Likelihood Ratio statistics.
FPE: Final Prediction Error. **HQI**: Hannan and Quinn Information Criterion.
AIC: Akaike Information Criterion. **SBC**: Schwarz Bayesian Criterion.

V.II Impulse Response Functions from SVAR

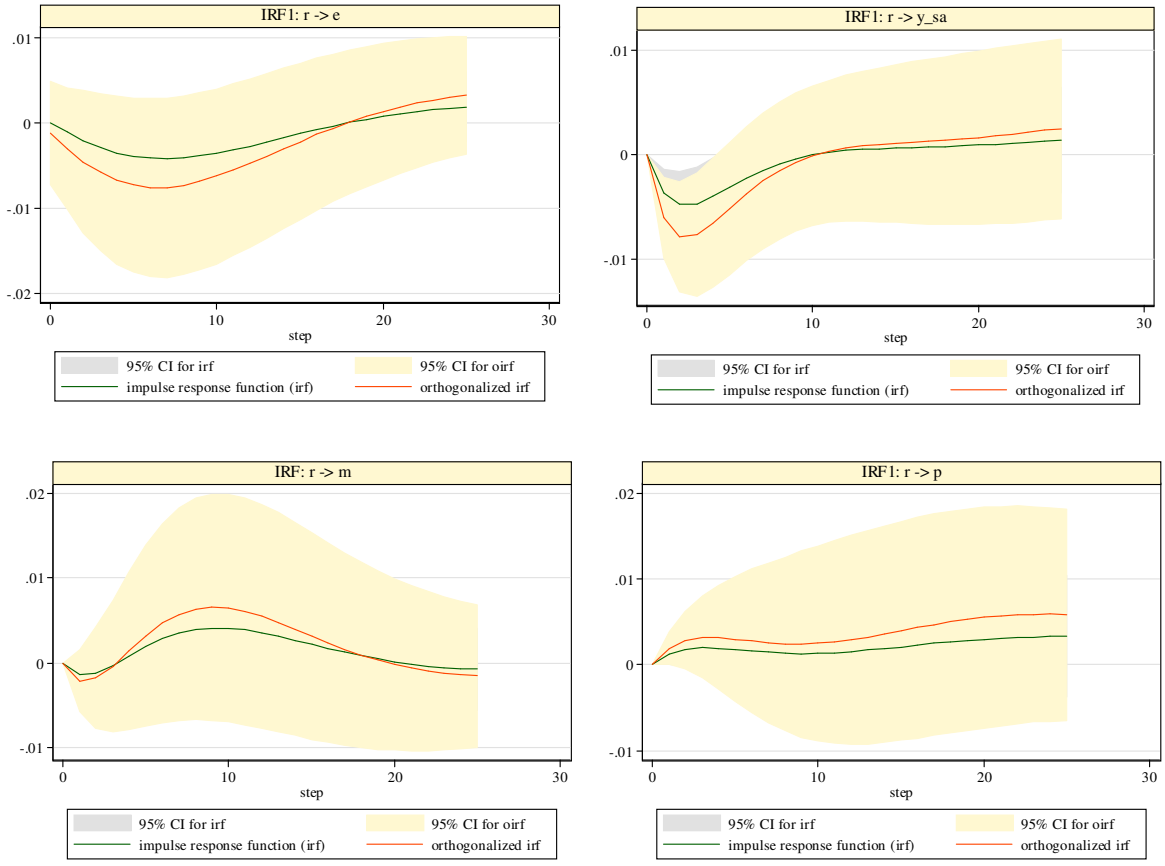
The Impulse Response function IRF is a very useful tool to identify the dynamics of the model by analyzing the evolution of the effect of a shock in the series over time, a shock in the residual of a series has an effect on the mean of the variables in the system, meaning that IRF also represents the importance of a given variable in the model and serves as a measurement of the persistence of shocks, the definition of a shock in the IRF analysis is a standard deviation change in a given variable series, on the interpretation of the IRF it is worth to stress that it is an overall representation of the dynamic relationship in the data between a variable subject to a shock in another variable *ceteris paribus* meaning that other factors being constant (clearly this is not the case) and it is important to retrieve the fact that IRF does not serve as forecasts of what would be the shape of the future response to a shock.

Both the IRF and the Orthogonalised IRF are presented for a 30 quarter steps ahead with a confidence interval shown in the shaded area.

V.II-I Domestic Monetary Shock effects

Evidence on the "Price puzzle" is found in the response of a rise in the domestic interest rate as a monetary shock shows a puzzling effect on the response of the price level as it persists to rise after a monetary contraction, which is indicated incorrectly in the positive response of money to an increased interest rate over time despite the tiny magnitude of the response, even a flat response of the price level is seen as puzzling, after all not the interest rate is not the sole driver of the price level in an economy. IRF shows an instant decrease in monetary aggregates in the first 3-4 quarters then followed by rather puzzling increase in real money and prices corresponding to a monetary contraction measured in a one standard deviation positive shock in the Interest rate, this is a puzzling result in direction but slight in magnitude and not very vital.

Figure 2: Impact on the Financial System of an Unexpected Shock in the Interest Rate



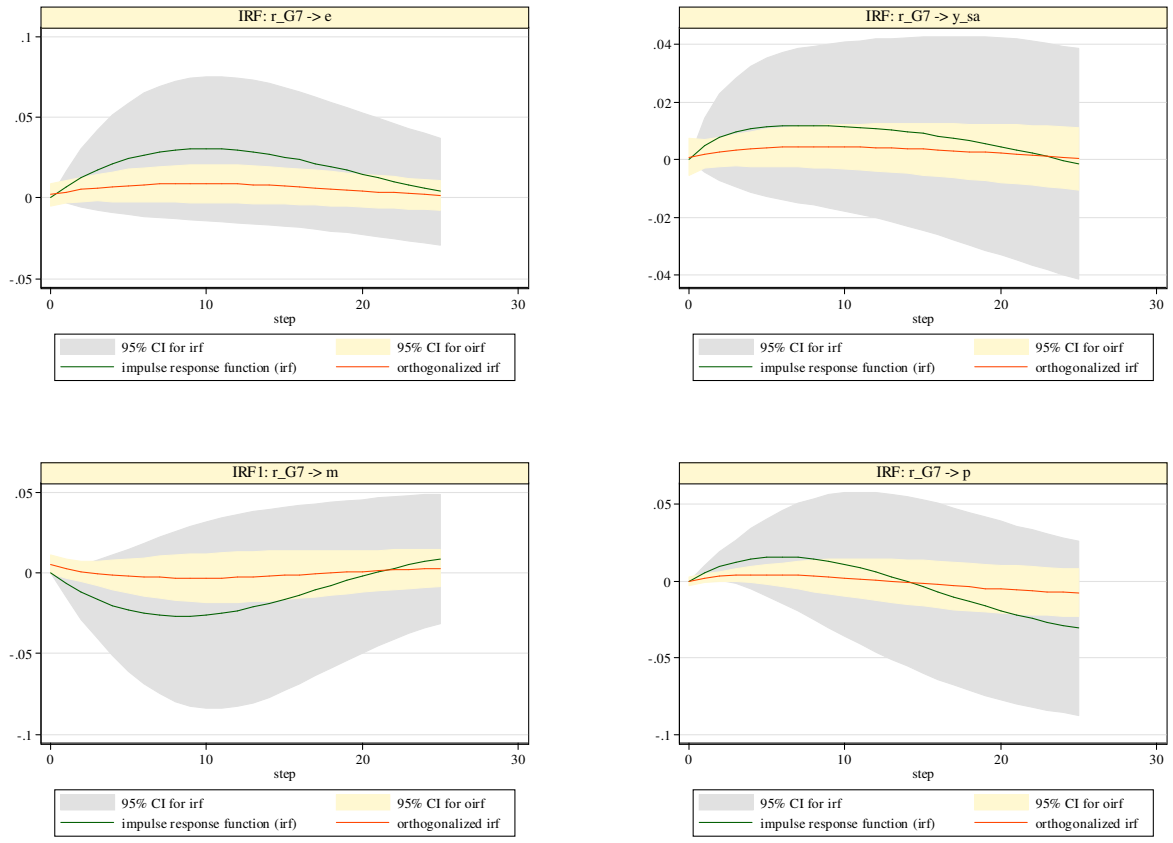
The 'correct' responses are exhibited in the appreciation of the exchange rate and output, the exchange rate that lasts for 10 quarters then instead of reverting to the initial situation the effect after 20 quarters (5 years) is a depreciation that is most likely due to other factors that are not 'constant' especially over time.

The most 'correct' response seem in the Korean data is in the loss of output corresponding to a monetary contraction that fades-out after about 10 quarters, the explanation of that scenario is related to the corporate capital structure in the Korean economy where the firms are highly leveraged and a rise in the interest rates would increase the cost of capital and handicap new investments and projects that drives the growth, indicating that the interest rate was unnecessarily high and did strangle the economy.
Generally the magnitudes of the IRFs are quite low.

V.II-II Foreign Monetary Shock effects

On the response of the macroeconomic variables to a foreign shock in the interest rate, with our expectations, the exchange rate depreciates due to the potential capital outflow attracted by higher yields on foreign bonds, the positive response of Output fading out over time is consistent with the Beggar-thy-neighbour policy scenario, as the Korean economy is benefiting from the foreign contraction.

Figure 3: Impact on the Financial System of an Unexpected Shock In The weighted average G7 Interest Rates



against the intuitions was the high negative responsiveness of the domestic Prices and money aggregates which is not so difficult to explain in an open economy driven by the foreign financial sector and hugely

dependent on foreign advanced markets, one explanation could be related with the capital outflow as the banking sector mobilise some of its deposits into foreign bonds encouraged by the higher foreign interest rates.

The responses of the financial system to the foreign monetary policy was higher in magnitudes but slower in its evolution over time, but still it reflects the high dependence of Korea on the aggregated monetary policies among the G7 countries.

V. Concluding remarks

Occurrence of the price puzzle might be due to the empirical strategy inaccuracy in using the very general CPI for price level of the whole economy where including a measure for commodity prices in the analysis could avoid the price puzzle as suggested in the modelling strategy in Christiano, Eichenbaum & Evans (1996), In brief this paper overcomes the use of unrestricted VAR in modelling monetary policy shocks, the effects of monetary policy under unrestricted VAR are almost meaningless and puzzles occur due to shortcomings of the modelling strategy and misspecification in the VAR, unrestricted VAR is absolutely inappropriate to identify shocks as an alternative for rejection of the restrictions on the primitive system, however the methodology relies on an assumption of the variables all variables to be stationary series, time series analysis of the statistical properties indicate that most of the macroeconomic variables are non-stationary series with a unit root as shown in Nelson & Plosser (1982).

This small study would be further improved in various ways; definitely the approach in this paper would be improved if the methodology considers cointegrated VAR incorporating an augmented Dickey-Fuller test of unit root, determining the integration properties then it would be possible to test for cointegrated vectors among the variables as stationary long run relations between non-stationary variables.

In the lights of results obtained conditional to the methodology applied, it is shown that the effects of a contractionary monetary policy indicated by a rise in the interest rates would affect the price level ……

Our results confirm the occurrence of the puzzles of Liquidity, Price puzzle and the exchange rate puzzle, we also obtain small evidence on the transmission of interest rates, as the Korean interest rate is not following the developments of the aggregated interest rates of the G7, which should be expected and explained by the small open nature of the Korean economy.

Our results suggest that a domestic monetary contraction at home is insufficient to cool down the inflationary pressures and to hold the quantity of money circulated in the economy, whilst the lost output is more significant, a contractionary monetary policy would fail to reduce inflation with a high expense on output and hence employment, such a high 'sacrifice ratio' provides an important policy implication on the potential consequences of the domestic contraction, respectively a foreign monetary contraction leads to a reduction in the domestic price level over time despite the initial inflationary effect, and also affecting

the exchange rate to depreciate as naturally there would be a capital outflow which may explain the reduction in the domestic monetary aggregates, given these responses to the foreign interest rate with a positive response of output to a foreign contraction these results suggest that the targets of monetary policy are determined by the foreign monetary policy showing little capacity for an independent monetary policy for a small open economy of Korea, as well as the limited ability of domestic interest rate to defend the currency from devaluation.

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