Banco Central de Chile
Documentos de Trabajo

Central Bank of Chile
Working Papers

N° 220

Agosto 2003

THE EFFECTS OF NOMINAL AND REAL SHOCKS ON THE CHILEAN REAL EXCHANGE RATE DURING THE NINETIES

Claudio Soto

BANCO CENTRAL DE CHILE

CENTRAL BANK OF CHILE

Documentos de Trabajo del Banco Central de Chile
Working Papers of the Central Bank of Chile
Huérfanos 1175, primer piso.
Teléfono: (56-2) 6702475; Fax: (56-2) 6702231

Documento de Trabajo
N° 220

Working Paper
N° 220

THE EFFECTS OF NOMINAL AND REAL SHOCKS ON THE CHILEAN REAL EXCHANGE RATE DURING THE NINETIES

Claudio Soto
Economista Senior
Gerencia de Investigación Económica
Banco Central de Chile

Resumen
Utilizando VAR identificados mediante restricciones de largo plazo, este trabajo evalúa la importancia de shocks reales y nominales sobre el tipo de cambio real en Chile durante los años noventa. Diversas estimaciones indican que los shocks nominales explican alrededor del 30% de la variabilidad del error de pronóstico de esta variable en el corto plazo. Un shock nominal produce una apreciación del tipo de cambio real que dura aproximadamente cinco meses. El impacto de los shocks reales depende de la naturaleza del mismo. Mientras que un shock de productividad aprecia el tipo de real, un shock de demanda genera una depreciación real. La descomposición histórica muestra que durante los noventa no hubo grandes desalineamientos del tipo de cambio con relación a su valor de largo plazo.

Abstract
Using structural VARs identified with long-run restrictions, this paper evaluates the importance of nominal shocks and real disturbances on the Chilean real exchange rate (RER) during the nineties. Different estimations indicate that nominal disturbances account for about 30% of the variance of the forecast error of the RER in the short run. Positive nominal shocks produce an appreciation of RER that lasts five months. The effect of real shocks depends on the nature of the shocks. A positive productivity shock appreciates the real exchange rate while a positive expenditure shock causes a real depreciation of the currency. The historical decomposition of the RER does not show periods of large misalignment.

Agradezco los valiosos comentarios de César Calderón. El resto de los errores son míos.
E-mail: csotog@bcentral.cl.

1 Introduction

During the 90's the real exchange rate in Chile showed a persistent downward trend (see figure 1).[1] One hypothesis for this phenomenon was associated with the productivity growth the country faced during this period, which would have been larger than the productivity gains of the trade partners. Basically, the argument is that the Balassa-Samuelson effect dominated the evolution of the real exchange rate (RER) in this period.[2] In fact, in the middle of the 90's the Chilean authority officially incorporated a 2% appreciation of the central parity of the (nominal) exchange rate as a way of taking explicitly into account productivity gains.[3]

At the same time some analysts claimed that an important source for the real appreciation of the exchange rate was the wide surge of capital inflows to the Latin-American countries in this period associated with the reduction in the risk premium faced by the region (Calvo, Reinhart and Leiderman, 1992). In the Chilean case this would have been even stronger since the monetary policy during this period was oriented towards reducing the two digit inflation rate prevailing at the end of the 80's and, therefore, it was relatively tight. In fact, to gain some independence for the monetary policy without sacrificing the stability of the RER the Central Bank introduced in June 1991 a set of capital controls.[4]

The objective of the paper is to evaluate empirically the importance of nominal shocks on the volatility of the Chilean RER during the 90's and to analyze the effects of real shocks on this variable.

The empirical model is based on structural VARs identified by using long-run restrictions. Other papers that use this approach to identify the sources of fluctuation in the RER are Clarida and Gali (1994), Lee and Chinn (1998) and Rogers (1998). Clarida and Gali (1994) study the importance of nominal shocks on four major currencies. Analyzing the variance decomposition of tri-variate VARs with output, RER and price levels they conclude that in

[1] After the Asian crisis this trend in the Chilean real exchange rate has reverted.

[2] Délano and Valdés (1998) present estimation that indicates that the annual real appreciation of the exchange rate due to productivity differentials for the 1990-1997 period in Chile was in the range 0.7% to 0.9%.

[3] In September of 1999 the Central Bank eliminated the band for the nominal exchange rate. Starting from that date the exchange rate freely floats.

[4] The effectiveness of these controls in isolating the Chilean capital market from the international markets has been questioned by some authors. On this issue see Edwards (1999).

two of the four cases nominal shocks account for an important fraction of the variance of the RER. Lee and Chinn (1994) also analyze currencies from OECD countries. Using bi-variate VARs with the current account and the RER they also find that nominal shocks are important in explain the volatility of the RER. Finally Rogers (1998) studies the effects of monetary shock on the Dollar-Pound RER over 100 years. He uses VARs with five variables and distinguishes between money demand innovations and money supply shocks. In his case almost one-half of the variance of the forecast error of the RER is explained by the volatility of monetary shocks in short horizons.

The paper is organized as follows: In the second section I discuss briefly the methodology of the VAR and the structural approach to identify real and nominal shocks. In particular, I discuss the approach by Blanchard and Quah (1989) based on the assumption that nominal shocks do not have real effects in the long run. The third section analyzes the effects of nominal shocks on the RER. I estimated a VAR with the RER and the interest rate differential between Chile and the international capital market. To identify nominal and real shocks I assume that nominal disturbances do not have a permanent impact on the RER. The results show that the variance of the forecast error of the RER is mainly explained by real shocks. However in the short run the variance of the nominal shocks account for an important fraction of the total variance of the RER. In the fourth section I use two alternative identification schemes to decompose and analyze the effects of real shocks. In particular, I assume that the real shocks are composed by two types of shocks: a productivity shock and a demand shock. This distinction between types of shocks is important since they turn out to have opposite impact on the RER. The impulse-response functions show that productivity shocks produce a permanent real appreciation of the exchange rate whereas innovations in demand have a positive impact on this variable. Finally, in the fifth section concludes.

2 Structural VARs

The empirical model used to analyze the influence of nominal and real shocks is based on the estimation of VARs. Consider the following dynamic structural model describing the data generating process:

$$B_0 x_t = B(L) x_{t-1} + \varepsilon_t \tag{1}$$

The vector x_t includes n endogenous variables contemporaneously correlated through the matrix B_0. One possible normalization of the system consists on setting the elements of the diagonal of this matrix to 1's. $B(L)$ is a polynomial in the *lag* operator composed by $(n \times n)$ matrices and ε_t is a $(n \times 1)$ vector of structural shocks with covariance matrix Σ_ε. We assume that the structural shocks have no contemporaneous correlation and they are not autocorrelated. This implies that Σ_ε is a diagonal matrix.

The reduced form of the model is given by following equation:

$$x_t = B_0^{-1} B(L) x_{t-1} + B_0^{-1} \varepsilon_t$$

From the reduced form of the model we can obtain the Wold Moving Average (WMA) representation of the system:

$$x_t = C(L) e_t \tag{2}$$

where $C(L) = [I - B_0^{-1} B(L) L]^{-1}$ is a polynomial in the lag operator with $C(0) = I_n$, and $e_t = B_0^{-1} \varepsilon_t$ is a vector of residuals from the reduced form. In order to express the model in WMA representation it is required that the variables in vector x_t to be stationary.

The residuals of the reduced form correspond to a linear combination of the structural shocks. Therefore, the WMA of the reduced form is not useful to isolate the impact of different structural innovations to the system. In order to identify these shocks it is necessary to know the elements of the matrix B_0. Notice first that the covariance matrix of the residual of the reduced form can be expressed as follows:

$$\begin{aligned} \Omega &= E(e_t e_t') \\ &= (B_0^{-1}) E(\varepsilon_t \varepsilon_t') (B_0^{-1})' \\ &= (B_0^{-1}) D (B_0^{-1})' \end{aligned} \tag{3}$$

This is a $\frac{n(n+1)}{2}$ equations system in the n^2 unknown elements of B_0 and D. Then, in order to solve this system it is necessary to impose $\frac{n(n-1)}{2}$ restrictions on those coefficients. The structural approach to the VARs consists in defining these restrictions using assumptions based on some economic model. Once we know the element of the matrix B_0 we can obtain the WMA of the structural model:

$$x_t = A(L) \varepsilon_t \tag{4}$$

where

$$A(L) = C(L)B_0 \tag{5}$$

Restrictions based on assumptions relative to the long run feature of the model were first introduced by Blanchard and Quah (1989). In a bi-variate model for output and unemplyment they identified two types of shocks: nominal shocks and real shocks. To identify these shocks they assumed that nominal shocks have no impact on the output level in the long run.

3 Real Exchange Rate and Nominal Shocks

The relationship between interest rate differentials and RER implied by the interest rate parity gives the starting point to analyze the effects of nominal shocks on the RER. The uncovered interest rate parity can be expressed as:

$$rr_t = E_t \Delta q_{t+1}$$

where rr_t is the differential between the domestic real interest rate and the foreign real interest rate and $E_t \Delta q_{t+1}$ is the expected change in the RER. Solving forward we obtain,

$$\bar{q}_t - q_t = E_t \sum_{i=0}^{\infty} rr_{t+i} \tag{6}$$

where $\bar{q}_t = \lim_{j \to \infty} E_t q_{t+j}$ is the expected long run leve for the RER at time t. The estimate of the sum of the interest rate differentials is equivalent to the projection of the transitory component of the RER given by the left hand side of equation (6).

Following Clarida and Gali, I estimated a bi-variate VAR with $(\Delta q_t, rr_t)$ to capture the relation implied by equation (6) between the forecast of the long run equilibrium level of the RER and the sum of the interest rate differentials. I assume that this bi-variate process is affected by two types of shock: a nominal shock and a real shock. The structural WMA representation of this model is:

$$\begin{pmatrix} \Delta q_t \\ rr_r \end{pmatrix} = A(L) \begin{pmatrix} \varepsilon_t^{\theta} \\ \varepsilon_t^{m} \end{pmatrix} \tag{7}$$

where $A(L)$ is polynomial in the *lag* operator. The shocks are identified by assuming that nominal innovations have no long run impact on the RER. In

terms of the equation (7) this assumption corresponds to:

$$A(1) = \begin{pmatrix} A_{11}(1) & 0 \\ A_{21}(1) & A_{22}(1) \end{pmatrix} \tag{8}$$

where $A_{ij}(1)$ is the sum of the responses of variable i to a shock j. The reduced number of variables included in the VAR does not allow a more precise definition of the nature of both structural shocks. The real shock is just any shock (or a combination of shocks) that have a permanent effect on the RER. The nominal shock in turn can be either a money demand disturbance, a money supply disturbance or both. This can be a problem if the innovations have impacts with different sign. I will discuss this issue later.

3.1 Results

The VAR was estimated with 5 lags using monthly data between 1990 and 1999 for the change in the Log of the RER and the real interest rate differential. The RER is the one published by the Central Bank of Chile. It corresponds to value of a foreign basket of intermediate goods in terms of Chilean currency divided by the value of a consumption basket in Chile. This definition for the RER is consistent with the standard definition of RER for dependent economies where this variable corresponds to the ratio between the price of traded goods and non-traded goods (Delano and Valdes, 1998) The real interest rate differential is constructed using an indexed interest rate on lending as a proxy for the domestic real interest rate and the Libor for the foreign interest rate. Valdes (1998) shows that the indexed rates are a good proxy for the ex-post real rates in the Chilean case. The ADF test cannot reject the hypothesis that the natural logarithm of the RER is I(1) at 5% level. The first difference of this series and the real interest rate differential are both stationary. The lag length of the VAR was determined using a likelihood ratio test. The ADF tests and the LR test are reported in tables 1a and 1b.

Impulse-response functions are presented in figure 2.[5] The responses of both the RER and the interest rate differential to a real shock are positive. In the long run this shock produces a real depreciation of the exchange rate

[5] Standard errors were obtained using Monte Carlo simulations.

of about 1.4%.[6] The interest rate differential increases on impact after the shock about 0.6% and then declines monotonically. The response of the RER to the nominal shock is negative and corresponds to a 1% real appreciation on impact. This effect lasts for approximately 5 months. This shock also produces an increase in the interest rate differential that lasts for 15 months.

The response of the RER to the real shock is consistent with the results obtained by Clarida and Gali (1994) and Lee and Chinn (1998) for some OECD countries. Clarida and Gali interpret the real shock as a productivity shock. Using a open economy macro model they explain the positive impact of this shock on the RER: A productivity shock produces a permanent output expansion. In equilibrium the aggregate demand must expand and this requires an increase in the RER as long as the aggregate demand is positively related with it. One important difference between the results presented in this section and the results obtained by Clarida and Gali is that they also identify a demand shock that has a permanent effects on the RER.

If we interpret the real shock as a productivity shock in the context of a model with tradable and non-tradable goods, then the evidence presented in figure 2 contradicts the hypothesis that the downward trend in the RER could be associated to a Balassa-Samuelson effect. In a tradable/non-tradable goods model a positive innovation in domestic productivity with respect to the productivity in the trade partners increases the price of the non-tradable goods and produces an appreciation in the RER. In the Chilean case there is strong evidence that during the 90's gains in productivity were large (Delano and Valdes, 1998). One possible explanation to this puzzle is that there is another source of fluctuations that has permanent effects on the RER which is not captured by the bi-variated VAR. This leads to the point made by Faust and Leeper (1997): if one identified structural shock consists of two independent shocks, then the Blanchard-Quah methodology is valid only if the underlying macroeconomic variables respond to the two shocks in the same direction. In the next section I use two alternative identification schemes to decompose different real shocks in the line of Clarida and Gali, and Rogers.

The negative impact of the nominal shock on the RER can be interpreted as evidence of price stickiness. If we interpret the nominal shock as a (negative) monetary shock we have that a contraction in the monetary policy

[6]For a depreciation of the RER I mean a reduction of the value of the domestic consumption basket relative to the foreign basket.

leads to a transitory appreciation in the RER in line with the famous paper by Dornbush (1976). In his paper, Dornbush showed that when price adjustment is slow, a negative monetary shock produces an increase in the interest rate that is matched with a fall in the RER. In the trajectory towards the long run equilibrium the RER increases and the interest rate falls. This is consistent with the impulse-response functions depicted in figure 2.

To determine the importance of nominal shocks I decompose the variance of the forecast error of the RER into the fraction associated with real shocks and the one associated with nominal shocks. The variance decomposition is reported in table 2. We can see that a larger fraction of the variance of the RER is associated with the variance of the real shocks. However, the fraction explained by the volatility of the nominal shock is more than 30% of the total variance in the short run. After one year, nominal shocks still account for 18% of the total variance. In the long run the importance of this shocks decline to about 10%.

The historical decomposition of the RER is presented in figure 3. In the top panel are depicted the actual the level of the RER (normalized so that 1990 is equal to zero) and the permanent component of this series (doted line). The second figure shows the difference between these two series, which corresponds to the misalignment of RER under the assumption that at the beginning of 1990 this variable was in the long-run equilibrium. According to this figure during the 90's the RER would have been overvalued between 1% and 3% most of the time. However, the movements in the actual RER follow closely the movements in the permanent component. The major discrepancies between this two series occur at the end of the period. In 1998 an increase in the permanent value of the RER would have led to an undervaluation of approximately 2.4%. While at the end of 1999 the RER would have been overvalued by almost 3.6%. The problem with this analysis is that it rests on an arbitrary equilibrium level for the RER.

4 Decomposing real Shocks

As discussed in the previous section the real shock could be composed of many different types of shocks that may affect the RER in different ways. In this section I present two alternative VAR models in which real shocks are decomposed in two different type of shocks: productivity shocks and demand shocks .

4.1 Output, Real Exchange Rate and Interest Rate Differential

The first model is based on the model estimated by Clarida and Gali. The VAR contains three variables: the change in the log of output, the change in the log of the RER and the interest rate differential. The output series corresponds to IMACEC (*Indice Mensual de Actividad Económica*) which is an index of aggregate activity calculated over a monthly base. According to the ADF test we cannot reject the null hypothesis that this series is I(1) with 95% confidence (table 1). There are three structural shocks affecting the process for these three variables: a productivity shock, ε_t^{θ}, a demand shock, ε_t^{d} and a nominal shock, ε_t^{m}.

The assumptions needed to identify the shocks are the following: The productivity shock can have permanent effect on both the output level and the RER. The demand shock does not affect output in the long run but it can have a permanent effect on the RER. This effect is possible only if the demand shock implies also a change in the composition of demand. In particular, an increase in demand for tradable goods relative to non-tradable goods will imply a permanent depreciation of the RER. Finally, nominal innovations have just transitory effects.

Figure 4 presents the impulse-response functions. The response of the RER to the productivity shock and the demand shock confirm the hypothesis that real shocks are composed of shocks with different impacts on this variable. A productivity innovation produces a real appreciation of the exchange rate as would be predicted by the Balassa-Samuelson hypothesis. On the contrary, a disturbance that changes the composition of the aggregate demand has a positive effect on the RER. The nominal shock has a positive impact on the interest rate differential and there is evidence of overshooting in the exchange rate as a response to this type of innovations. In general, the response of the variables to the different types of shocks is consistent with what would have been expected. However, the response of output to the nominal disturbance is puzzling: if we interpret the nominal shock as a money innovation, then a contractive monetary policy produces an expansion in output. This effect is quite disturbing. It is difficult to give a plausible explanation for it. In fact, this could indicate that identification problems are still present in the model. In order to evaluate how robust are the results for the RER the next section presents results obtained using a different identification scheme.

4.2 Real Exchange Rate, Trade Balance and Interest Rate Differential

A second tri-variate VAR is estimated with trade balance instead of output. This series corresponds to the net trade balance in local currency divided by a price index and a proxy of the real output level. The price index used is the CPI and the proxy of the real output is the IMACEC. Again I assume that there are three types of shocks: a productivity shock, a demand shock and a nominal shock. The identification is as follows: productivity shocks have a long run impact on the RER and on the level of net foreign assets held by domestic residents. Demand shocks can have permanent effects on the RER but the effects on the stock of foreign assets are zero in the long run. Nominal disturbances do not have permanent effects.

Impulse-response functions are depicted in figure 5. As in the previous case a productivity innovation has a negative impact on the RER while a demand shock has a positive effect. The nominal innovation also has a positive impact on the interest rate differential and it produces a fall in the RER. The appreciation of the RER in response to this shock lasts approximately 5 month.

Under this identification scheme the responses of all variables to the three different shocks are consistent with the priors: a productivity shock has a positive impact on the trade balance and a negative effect on the interest rate differential. A demand shock has a negative impact on the trade balance. Then, after 5 months this effect is reverted. Finally, the nominal innovation has positive effect on the trade balance.

5 Concluding Remarks

The paper analyzes the effect of nominal innovations and the impact of real shocks on the RER for the Chilean case during the 90's. The empirical analysis is based on the estimation of VARs identified by long run restrictions as in Blanchard-Quah (1989).

The evidence presented shows that for the Chilean case nominal shocks are important in explaining the volatility of the RER in the short run. The variance of nominal shocks accounts for more than 30% of the variance of the forecast error of the RER in a horizon of 6 months. In horizons of more than three years the variance of this shocks accounts for only 10% of the RER.

In all three models estimated, a nominal shock that increases the interest rate differential produces an appreciation of the RER. The fall of the RER is about 1 to 1.5% for an increase in the interest differential of 1%. This effects occurs between the first and the third months after the shock and it lasts for approximately 5 months. Then, if we interpret the nominal shock as a monetary shock this is evidence that the exchange rate overshoots in response to monetary innovations.

The historical decomposition of the RER shows that in the 90's the actual RER was in line with its permanent value. Only in 1998 and 1999 there is evidence of misalignment. However, in order to determine whether the RER was in fact misaligned it is necessary to define a reference year in which the RER would have been in equilibrium.

Finally, the impact of real shocks on the RER depends on the nature of the shock. A productivity shock produces a permanent appreciation in the RER while a demand shock that alters the composition of the aggregate expenditure has a positive impact. These results are robust to two alternative identification schemes based on assumptions about the long run properties of the series.

References

[1] Blanchard, O. and D. Quah (1989), "Dynamic Effects of Aggregate Demand and Supply Disturbances". American Economic Review 79: 655-673.

[2] Calvo G., Leiderman L. and Reinhart C. (1992), "Capital Inflows and Real Exchange Rate Appreciation in Latin America: The Role of External Factors". IMF Working Paper 92/64. August.

[3] Clarida, R. and J. Gali (1994), "Sources of real exchange Fluctuations: How Important are Nominal Shocks". NBER Working Paper #4658, Cambridge. February.

[4] Délano, V. and R. Valdés (1998), "Productividad y Tipo de Cambio Real en Chile". Documentos de Trabajo 38, Banco Central de Chile. December.

[5] Dornbush, R. (1976), "Expectations and exchange rate Dynamics". Journal of Political Economy 84: 1161-1176.

[6] Edwards, S. (1999), "How Effective are Capital Controls?". Journal of Economic Perspective, Sept.

[7] Faust, J. and E. Leeper (1997), "When Do Long-run Identifying Restrictions Give reliable Results?". Journal of Business and Economic Statistics 15: 345-354.

[8] Lee, J. and Menzie D. Chinn (1998), "The Current Account and The RER: A Structural VAR Analysis of Major Currencies". NBER Working Paper #6495, Cambridge, Massachusetts. April

[9] Keating, J. W. (1992), "Structural Approaches to Vector Autorregressions". Federal Reserve Bank of St. Louis Review, September/October: 37-57.

Rogers, J (1998), "Monetary Shocks and Real Exchange Rates". International Finance Discussion Papers #612, Board of Governors of the Federal Reserve System. May.

[10] Valdés, R. (1998). "Efectos de la Política Monetaria en Chile". Cuadernos de Economía 104: 97-125.

Table 1a. ADF Tests

	$Log(RER)$	$\Delta Log(RER)$	$r - r^*$
$T(\hat{\rho} - 1)$	-1.315	-212.489	-22.050
Critical Value 5%	-13.7	-13.7	-13.7
	$Log(Y)$	$\Delta Log(Y)$	TB
$T(\hat{\rho} - 1)$	-0.666	-65.457	-7.338
Critical Value 5%	-13.7	-13.7	-13.7

Table 1b. Likelihood Ratio Tests

Bi-variate VAR: $(\Delta q_t, rr_t)$

Lags	1/2	2/3	3/4	4/5	5/6	6/7	5/2
Ratio Test	4.899	6.896	4.887	11.822	4.309	5.7162	22.139
Sig. level	(0.297)	(0.152)	(0.299)	(0.018)	(0.366)	(0.221)	(0.035)

Tri-variate VAR $(\Delta y_t, \Delta q_t, rr_t)$

Lags	1/2	2/3	3/4	4/5	5/6	6/7	5/2
Ratio Test	23.711	11.524	25.289	14.330	10.227	2.639	35.783
Sig. level	(0.005)	(0.241)	(0.003)	(0.111)	(0.332)	(0.977)	(0.008)

Tri-variate VAR $(TB_t, \Delta q_t, rr_t)$

Lags	1/2	2/3	3/4	4/5	5/6	6/7	7/8
Ratio Test	6.131	12.251	9.851	13.777	4.724	7.603	7.764
Sig. level	(0.726)	(0.199)	(0.362)	(0.130)	(0.857)	(0.575)	(0.558)

Table 2. Variance Decomposition
Bi-variate VAR

Real Exchange Rate		
Steps	Real Shock	Nominal Shock
1	0.6629	0.3371
3	0.6968	0.3032
6	0.7235	0.2765
9	0.7629	0.2371
12	0.8116	0.1884
16	0.8512	0.1488
24	0.8742	0.1258
36	0.8938	0.1062
48	0.8997	0.1003
Interest rate Differential		
Steps	Real Shock	Nominal Shock
1	0.3963	0.6036
3	0.4304	0.5695
6	0.4407	0.5592
9	0.438	0.5617
12	0.4382	0.5617
16	0.4385	0.5614
24	0.4385	0.5614
36	0.4385	0.5614
48	0.4385	0.5614

Figure 1

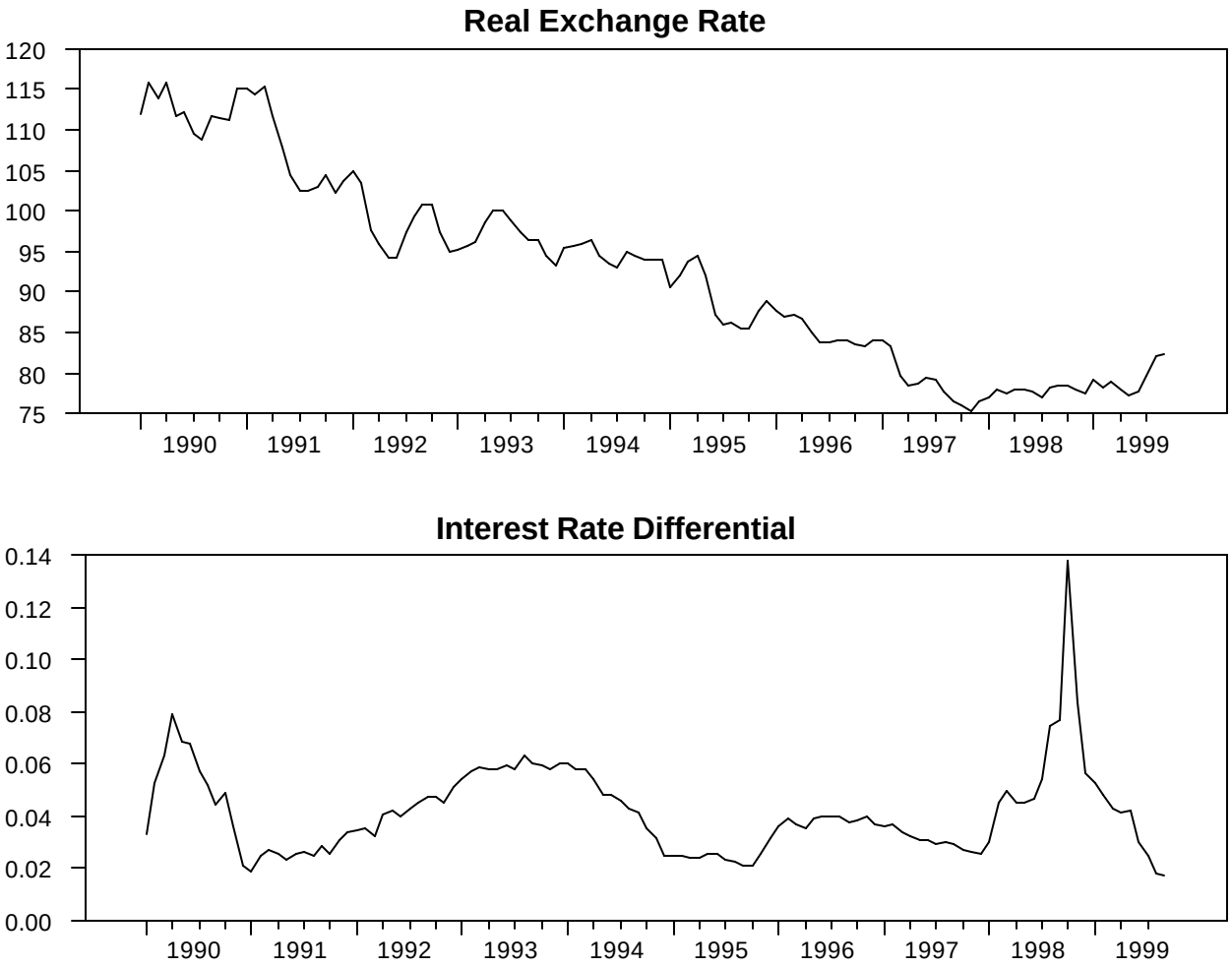
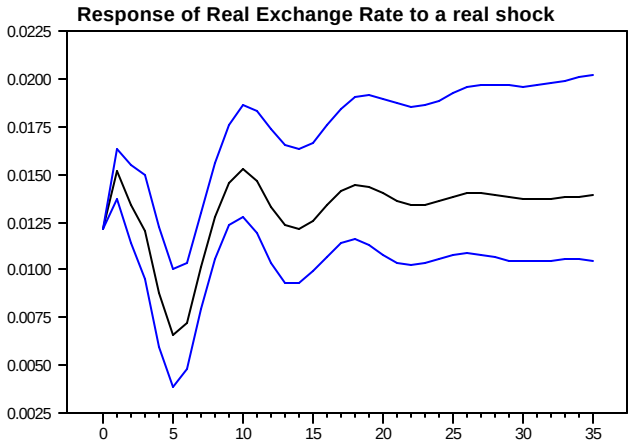
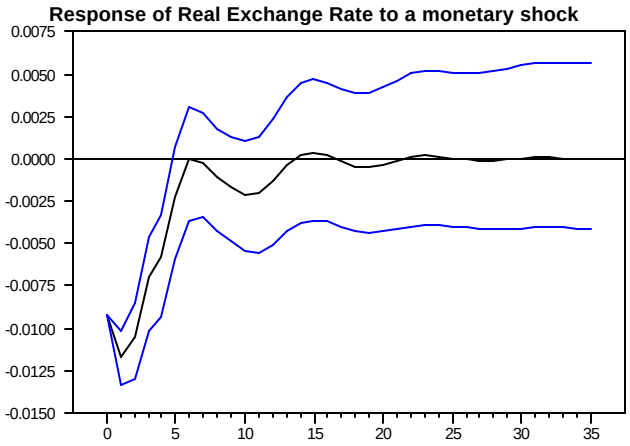
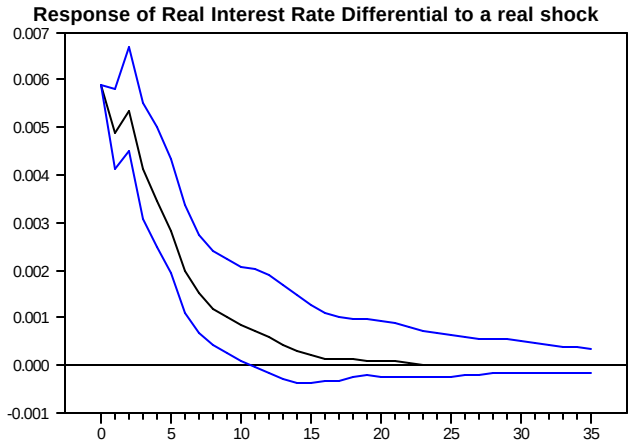

Real Exchange Rate
120
115
110
105
100
95
90
85
80
75
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
Interest Rate Differential
0.14
0.12
0.10
0.08
0.06
0.04
0.02
0.00
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999

Figure 2

Impulse-Response Function







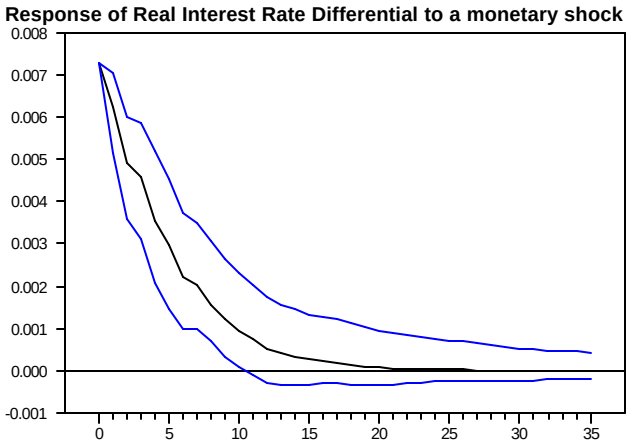


Figure 3

Historical Decomposition

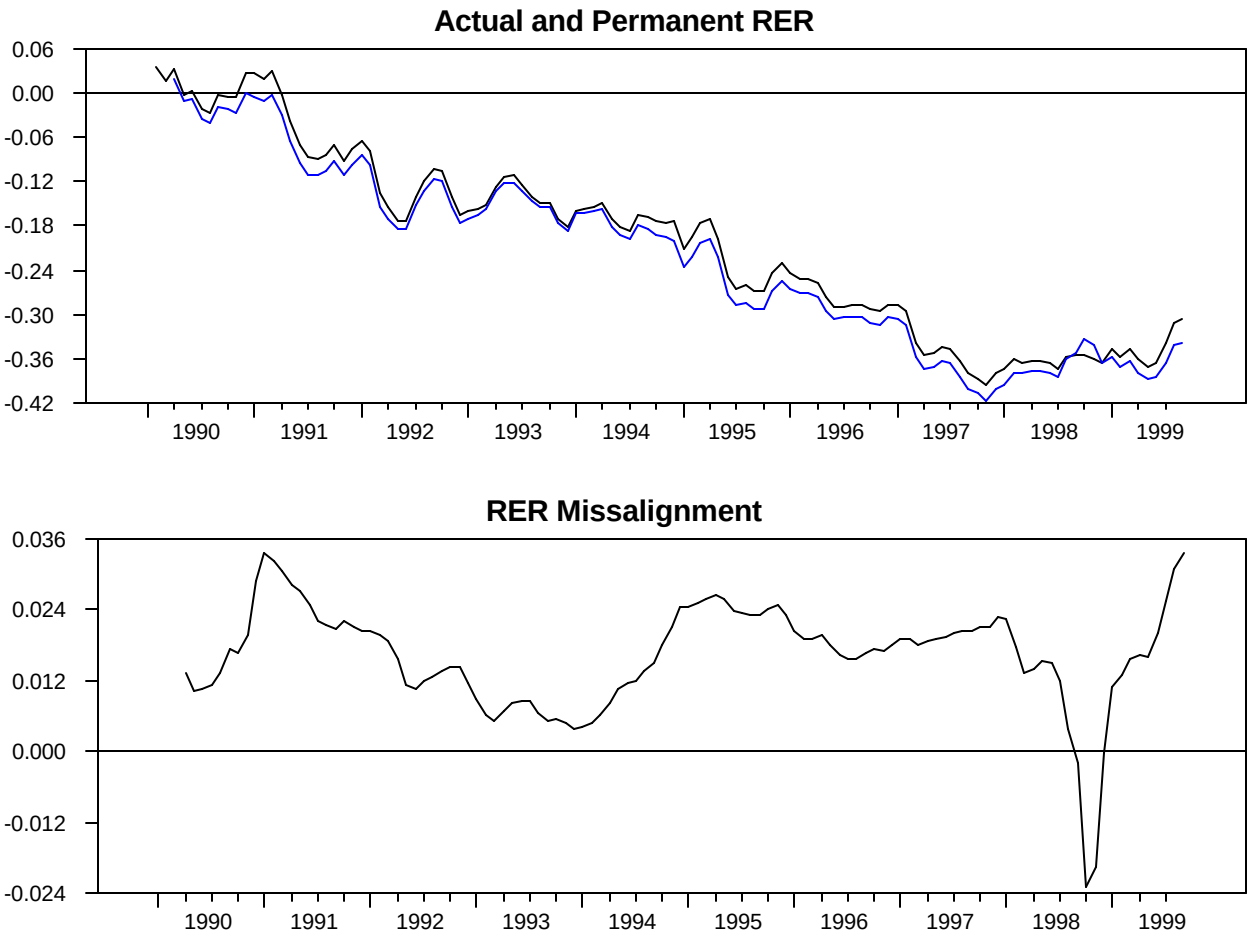


Figure 4

Impulse-Response Function

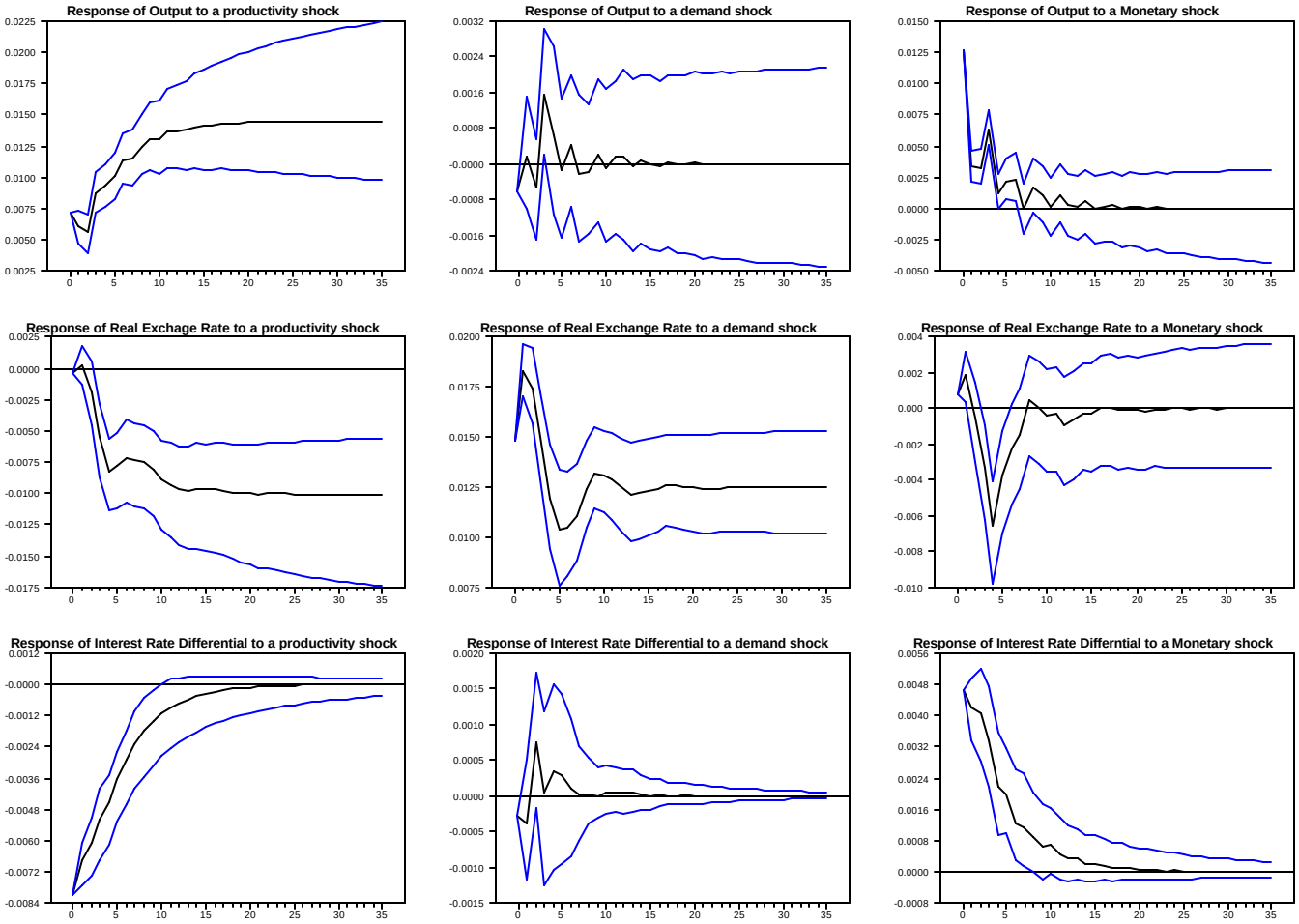
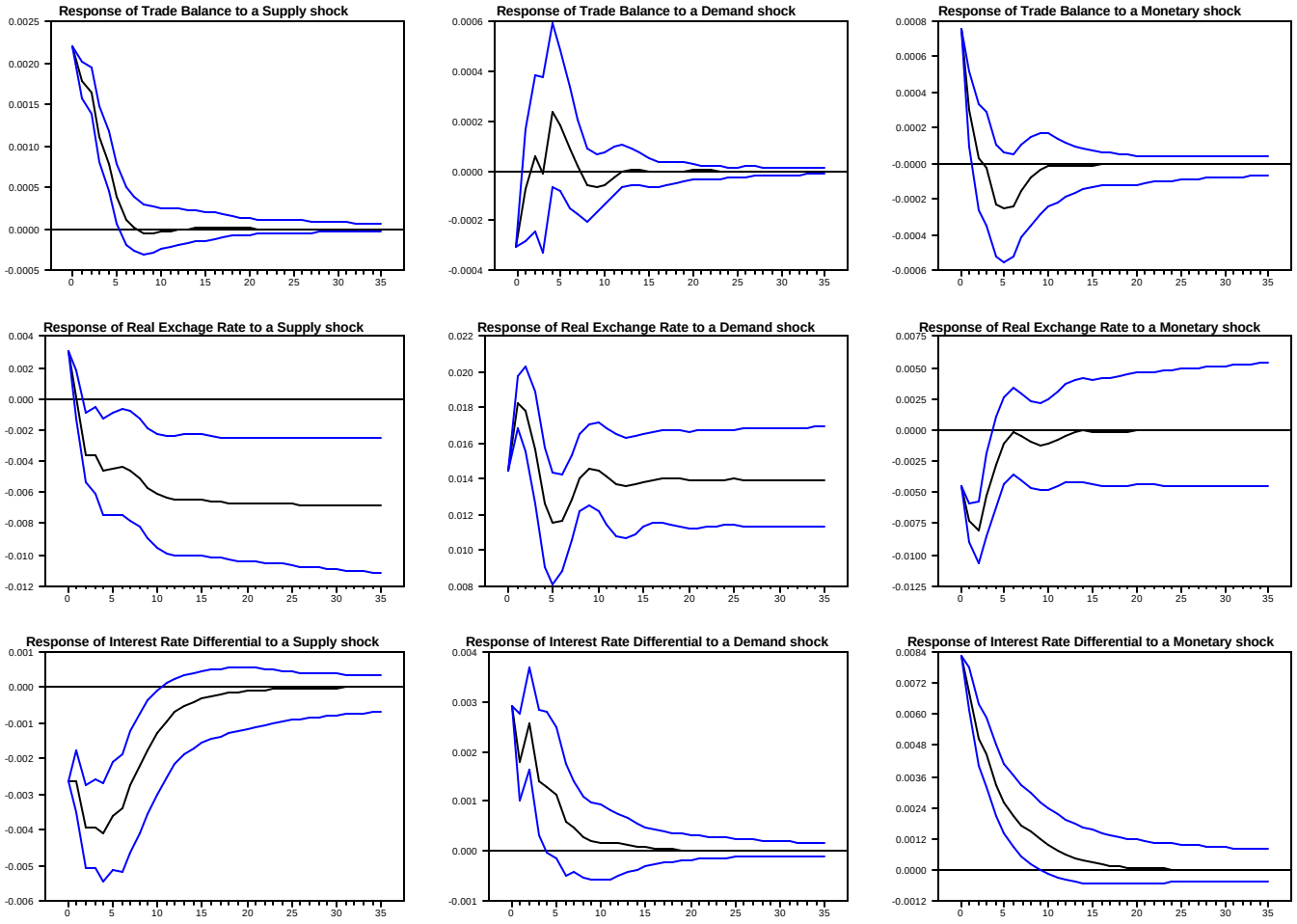


Figure 5

Impulse-Response Function



Documentos de Trabajo
Banco Central de Chile

Working Papers
Central Bank of Chile

NÚMEROS ANTERIORES

PAST ISSUES

La serie de Documentos de Trabajo en versión PDF puede obtenerse gratis en la dirección electrónica: http://www.bcentral.cl/Estudios/DTBC/doctrab.htm. Existe la posibilidad de solicitar una copia impresa con un costo de $500 si es dentro de Chile y US$12 si es para fuera de Chile. Las solicitudes se pueden hacer por fax: (56-2) 6702231 o a través de correo electrónico: bcch@bcentral.cl.

Working Papers in PDF format can be downloaded free of charge from: http://www.bcentral.cl/Estudios/DTBC/doctrab.htm. Printed versions can be ordered individually for US$12 per copy (for orders inside Chile the charge is Ch$500.) Orders can be placed by fax: (56-2) 6702231 or e-mail: bcch@bcentral.cl.

DTBC-219 Agosto 2003
Monetary Policy, Job Flows and Unemployment in a Sticky Price Framework
Claudio Soto

DTBC-218 Agosto 2003
Is there Lending Rate Stickiness in the Chilean Banking Industry?
Solange Berstein y Rodrigo Fuentes

DTBC-217 Julio 2003
Macroeconomic Policies and Performance in Latin America
César Calderón y Klaus Schmidt-Hebbel

DTBC-216 Junio 2003
Openness and Imperfect Pass-Through: Implications for the Monetary Policy
Claudio Soto y Jorge Selaive

DTBC-215 Junio 2003
Purchasing Power Parity in an Emerging Market Economy: A Long-Span Study for Chile
César Calderón y Roberto Duncan

DTBC-214 Junio 2003
Non-Traded Goods and Monetary Policy Trade-Offs in a Small Open Economy
Claudio Soto

DTBC-213 Junio 2003
Do Free Trade Agreements Enhance the Transmission of Shocks Across Countries?
César Calderón

DTBC-212 Junio 2003
Crisis Financieras Internacionales, Prestamista de Última Instancia y Nueva Arquitectura Financiera Internacional
Esteban Jadresic, Klaus Schmidt-Hebbel y Rodrigo Valdés

DTBC-211 Mayo 2003
Reserves over the Transitions to Floating and to Inflation Targeting: Lessons from the Developed World
Fernando Aportela, Francisco Gallego y Pablo García

DTBC-210 Mayo 2003
Trade Reforms and Manufacturing Industry in Chile
Roberto Álvarez y Rodrigo Fuentes

DTBC-209 Mayo 2003
Corporate Governance in Chile
Manuel R. Agosin y Ernesto Pastén H.

DTBC-208 Abril 2003
Indicadores Líderes del IMACEC
Luis Firinguetti y Hernán Rubio

DTBC-207 Marzo 2003
El Embrague Financiero: Un Mecanismo Alternativo de Amplificación Bancaria
Elías Albagli

DTBC-206 Marzo 2003
Efectos de las Intervenciones en el Mercado Cambiario: el Caso de Chile
Matías Tapia y Andrea Tokman

DTBC-205 Marzo 2003
Policy Evaluation and Empirical Growth Research
Steven N. Durlauf

DTBC-204 Marzo 2003
Growth and Adjustment in Chile: A Look at the 1990s
Vittorio Corbo y José A. Tessada