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Togan, Sübidey; Ersel, Hasan

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Zentrum für Europäische Integrationsforschung
Center for European Integration Studies
Rheinische Friedrich-Wilhelms-Universität Bonn



Sübidey Togan, Hasan Ersel

**Foreign Exchange Regime,
the Real Exchange Rate and
Current Account
Sustainability: The Case of
Turkey**

Working Paper

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Foreign Exchange Regime, the Real Exchange Rate and Current Account Sustainability: The Case of Turkey

*Sübiday Togan and Hasan Ersel**

Abstract: During the last two and half decades Turkey has suffered from three foreign exchange crisis resulting in considerable loss of income. The paper argues that the country in order to avoid the foreign exchange crisis has to stay away from having too big current account deficits. Noting that under perfect capital mobility there will always be the unavoidable risk of speculative attacks on the currency unless the country resolves its fiscal problems, attains price stability, and achieves a sound banking sector, the paper stresses importance of current account sustainability and highlights shortcomings of current policies pursued by Turkey.

Corresponding author: Sübiday Togan:

Bilkent University

Department of Economics

06800 Bilkent

Ankara, TURKEY

E-Mail: togan@bilkent.edu.tr

Telephone: 90-312-290 1794

Fax: 90-312-290 1794

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* SÜBIDEY TOGAN is from Bilkent University, Ankara and HASAN ERSEL from Sabanci University in Istanbul. We thank Juergen von Hagen, Jizhong Zhou and seminar participants at the Center for European Integration Studies (ZEI) in Bonn for their comments. Sübiday Togan thanks ZEI for its hospitality while this paper was written.

1. INTRODUCTION

During the last two and half decades Turkey has experienced three balance of payments crises.¹ These crises highlighted the danger of having too big current account deficits which are associated with a high probability of a balance of payments crisis. A natural question that arises is when these deficits are sustainable.

The purpose of this paper is to discuss the sustainability of current account deficits in Turkey. The paper is structured as follows. While section 2 considers the characteristics of the Turkish foreign exchange regime during the last two decades, section 3 concentrates on the study of developments in real exchange rate (RER). Section 4 analyzes the relation between current account and the real exchange rate, and section 5 discusses issues related with current account sustainability and determination of the equilibrium RER. Section 6 concludes.

2. FOREIGN EXCHANGE REGIME

Until the end of the 1970s, Turkey followed fixed and multiple exchange rate policy while experiencing relatively high inflation rates. The policy led to loss of competitiveness and eventually to the foreign exchange crisis of the late 1970's. GNP shrank by 0.5 percent in 1979 and by 2.8 percent in 1980. With the stabilization measures of 1980, Turkey devalued the Turkish Lira by 33 percent, and eliminated the multiple exchange rate system except for imports of fertilizers and fertilizer inputs. After May 1981 the exchange rate was adjusted daily against major currencies in order to maintain the competitiveness of Turkish exports. Multiple currency practices were phased out and bilateral payments agreements with non-Fund members were terminated during the first couple of years of the 1980 stabilization program. The government pursued a policy of RER depreciation, depreciating the RER annually on average by about 6 percent over the period 1980-1988.

In January 1984 domestic commercial banks were allowed to engage in foreign exchange operations within certain limits, and restrictions on foreign travel and investment from abroad were eased and simplified. The determination of the exchange rate was further liberalized by permitting banks to set their own rates within a specified band around the Central Bank rate. In August 1988 major reform was introduced and a system of market setting of foreign exchange rates was adopted. In 1989 foreign exchange operations and international capital movements were liberalized entirely.² In line with full convertibility of the Turkish Lira, banks were left free in determining exchange rates in their operations in 1990.

¹ These are the crises of late 1970's, 1994 and 2001.

² Turkey opened the capital account in 1989 before it had taken measures to upgrade banking and financial market supervision and regulation, adopt international auditing and accounting standards, strengthen corporate governance and shareholder rights, and modernize bankruptcy and insolvency procedures. The 1994 and 2001 crises occurred when the country was facing large fiscal deficits, public debts and high inflation rates. There were problems of competitiveness leading to substantial current account deficits. In

A drawback of the RER depreciation policy pursued during the 1980's was the decline in real wages measured in terms of foreign currency. By the second half of the 1980's the popular support for the government started to fall off. In the local elections of March 1989 the governing political party suffered heavy losses. To increase political support the government conceded substantial pay increases during collective bargaining in the public sector. Consequently, pressure built up in the private sector to arrive at similarly high wage settlements. As a result of these developments the real wages started to increase and RER started to appreciate.

According to the government the appreciation of the RER that occurred after 1989 was due to market forces. But during this period large capital inflows into Turkey occurred as the country was offering besides high real interest rates the prospect of steady real appreciation. During the 1990's the public finances had deteriorated considerably. The large public sector deficits could be financed by borrowing from the market at very high real interest rates.³ The government's implicit commitment to RER appreciation insured the private sector, domestic and foreign, against currency risk. It encouraged capital inflows from abroad and it encouraged lending to the public sector, giving rise to the phenomenon of large arbitrage-related short-term capital inflows.

The policy pursued during the first half of the 1990's was not sustainable. In 1993 the current account deficit to GNP ratio had reached 3.5 percent. In 1994 the country faced balance of payments crises as a result of which GNP shrank by 6.1 percent. With the introduction of stabilization measures the trend in RER was reversed. RER depreciated by 64 percent during January 1994 and April 1994. But because of the relatively weak coalition governments, the country had to reverse its economic policies. RER started to appreciate again after April 1994 and appreciated by about

addition the currency and maturity mismatches on the balance sheets of the banks had left the authorities little leeway for using either interest-rate or exchange rate adjustments to restore balance without undermining the stability of the banking sector. Finally, there was excessive dependence on short-term foreign borrowing to finance the current account deficits. These weaknesses contributed substantially to the balance of payments crisis of 1994 and 2001.

³ Real interest rate is defined as
$$r_t = \left[\frac{1 + \left(\frac{i_t}{100} \right)}{1 + \left(\frac{p_t}{100} \right)} - 1 \right] * 100$$
 where i_t denotes the annual rate of interest

on government bonds attained as the weighted average rate in auctions during the month t weighted by total sales during the month, and π_t the expected annual rate of inflation at time t over the period t to $t+12$. In the calculations of the real interest rate we set the expected annual rate of inflation at time t over the period t to $t+12$ equal to the actual annual rate of inflation over the period t to $t+12$ for the period 1991.01 to 2002.10. For the period 2002.11 to 2003.10 we set the expected annual rate of inflation equal to the expected inflation rate as determined from the survey conducted by the Central Bank of Turkey. Here we note that the real interest rate in general has been very high during most of the 1994-2003 period. Real interest rate turned out to be negative in the pre-crisis periods of 1994 and 2001, since the rise in inflation rate experienced after the crisis was not expected at pre-crisis periods. The average level of real interest rates over the period 1994.01 to 2003.10 was 25.5 percent.

23.5 percent during April 1994 and September 1995.

Between 1995 and 1997 the economy went through a boom period of above trend growth. But, in 1998 the economy was badly hit by the Russian crisis. In August 1999 the Marmara area of Turkey was hit by a severe earthquake and this was followed by a further large shock in the Bolu area in November, 1999. As a result of these shocks real GNP shrank by 6.1 percent in 1999. At the end of 1999 Turkey embarked upon an ambitious stabilization program. Central to the program has been the policy of using a pre-determined exchange rate path as a nominal anchor for reducing inflationary expectations. During the course of 2000 the RER appreciated considerably which aggravated further the current account deficits leading to concerns about the sustainability of the exchange rate regime. The current account deficit to GNP ratio reached 4.9 percent in 2000. This episode ended with a severe currency crisis in February 2001. There was a serious run on the Turkish Lira, interest rates sky rocketed and foreign exchange reserves started to decline rapidly. The government decided to abandon the crawling peg regime. The currency was floated. As a result, the exchange rate depreciated sharply. On May 15, 2001 the IMF increased its assistance under a new stand-by arrangement. This program aimed to strengthen the balance of public finances in a way that would prevent deterioration in the future. During the course of 2001 Turkey introduced a set of structural reforms. But the September 11 tragedy caused a threat to the reform progress. Turkey responded with a strengthened medium term program aimed at cleaning up the banking sector, consolidating fiscal adjustment and achieving disinflation. In February 2002 the IMF approved a three year stand-by credit for Turkey to support the government's economic program. The severity of the 2001 crisis has surprised nearly all observers. GNP during 2001 has contracted by 9.4 percent and the loss in employment is put at more than 1 million.⁴ Towards the end of 2001 RER started to appreciate again and the appreciation of the RER is continuing as of February 2004. With the appreciation of the RER considerable economic recovery was observed in 2002 and 2003.

Figure 1 shows the developments in current account deficit to GDP ratio on a quarterly basis starting with first quarter of 1987.^{5,6} Noting that the years of currency crisis were 1994 and 2001 the table reveals that the probability of a balance of payments crisis increases in Turkey as current account to GDP ratio increases above the critical level of 3.5 percent.⁷

⁴ The reason for the severity of the 2001 crisis compared to previous foreign exchange crisis is explained by the fact that by 2001 Turkey had a high level of 'liability dollarization', with high public and private foreign debt which was denominated in foreign currencies, and also a high share of foreign currency denominated bank deposits. As a result, the sharp depreciation caused a large increase in both the gross and the net indebtedness of the economy, which more than offset the positive effect of depreciation on the demand for exports.

⁵ Monthly series on current account, interest payments and interest receipts exists since December 1984. But quarterly national income series are available since 1987. Figure 1 shows the three period moving average of current account deficit to GDP ratio.

⁶ The figure shows the three period moving averages of current account to GDP ratio.

⁷ Besides the size of current account deficits the quality of the sources of financing the deficit matters a lot. A high percentage of short term debt increases the probability of sudden capital outflows leading to a crisis.

{Insert Figure 1}

To formally study the evolution of the foreign exchange rate regime over the last two decades in Turkey we turn to the IMF publication “Annual Report on Exchange Arrangements and Exchange Restrictions”. IMF in those reports classified the exchange rate policies based on information provided by the member countries. Until 1998 members’ regimes were grouped into three categories: (i) pegged regimes, (ii) regimes with limited flexibility, and (iii) more flexible arrangements, where regimes with limited flexibility referred to those cases that permit the exchange rate to fluctuate within a range or within a cooperative arrangement. In this classification the exchange rate arrangement (i) refers to fixed, (ii) to intermediate and (iii) to flexible regimes. However, the classification had two major shortcomings. First, it failed to capture differences between what the countries claimed to be doing and what they were doing in reality. Second, by lumping rigid forms of pegs together with softer pegs it failed to acknowledge the different degree of monetary autonomy afforded by each regime. To address these shortcomings IMF adopted in 1999 a new classification scheme based on still de facto policies. The new scheme allows for eight different categories ranging from the adoption of a foreign currency as legal tender to free floats. The eight regimes are: (I) dollarization and euroization, (II) currency board, (III) conventional fixed pegs, (IV) horizontal bands, (V) crawling pegs, (VI) crawling bands, (VII) managed float with no preannounced path for the exchange rate, and (VIII) independent float.⁸ This classification treats exchange arrangements I, II, and III as fixed regimes, IV, V, and VI as intermediate regimes, and VII and VIII as flexible regimes. Finally, Babula and Otker-Robe (2002) distinguish between 13 regimes. These regimes are: (1) formal dollarization and euroization, (2) currency union, (3) currency board arrangements, (4) conventional fixed pegs vis-a-vis single currency, (5) conventional fixed pegs vis-a-vis a basket of currencies, (6) horizontal bands, (7) forward looking crawling pegs, (8) backward looking crawling pegs, (9) forward looking crawling bands, (10) backward looking crawling bands, (11) tightly managed floats, (12) other managed floats with no predetermined exchange rate path, and (13) independently floating.⁹ The classification of Babula and Otker-Robe treats exchange

It is recognized that foreign direct investment (FDI) is by far the surest form of external financing. But FDI flows into Turkey have been rather low. Thus, external sustainability is an important issue for Turkey.

⁸ Under “conventional fixed pegs” the currency is pegged to another currency or currency basket within a band of at most +/- 1 percent. While “horizontal bands” refer to pegs with bands larger than +/- 1 percent, “crawling pegs” refer to pegs with central parity periodically adjusted in fixed amounts at a pre-announced rate or in response to changes in selected quantitative indicators. “Crawling bands” refer to crawling pegs combined with bands larger than +/- 1 percent. While “managed float with no preannounced path for the exchange rate” refer to a regime with active interventions without precommitment to a preannounced target or path for the exchange rate, the “independent float” regime refers to market determined exchange rate with monetary policy independent of exchange rate policy.

⁹ The crawl is viewed as “backward looking” when the crawl aim to passively accommodate e.g. past inflation differentials under a real exchange rate rule, and as “forward looking” when the exchange rate is adjusted at a preannounced fixed rate and/or set below projected inflation differentials, typically when the exchange rate is envisaged to have an anchor role. Under “tightly managed floats” interventions take the form of very tight monitoring that generally results in stable exchange rate without having a clear exchange rate path, so

arrangements 1, 2, and 3 as hard peg regimes, 4-11 as intermediate regimes, and 12 and 13 as floating regimes.

Table 1 reports in column 1 the exchange regime according to IMF classification prior to 1999, in column 2 the exchange regime according to the IMF classification after 1999, and in column 3 the exchange regime according to the classification of Babula and Otker-Robe. Although the first two columns do not reveal much about the exchange rate regime of Turkey followed during the 1980's, the column 3 shows that Turkey under high capital mobility has abandoned the intermediate regimes of "forward looking crawling bands" and "forward looking crawling pegs" and moved towards a regime of free floats. But even the classification of Babula and Otker-Robe does not reveal the essentials of the exchange regime followed by Turkey. We therefore turn to consideration of the basics of the de facto exchange rate regime followed by Turkey during the last two decades. Following Zhou (2002) we concentrate on three measures: (i) "volatility of exchange rates" defined as the average of absolute monthly percentage changes in the nominal exchange rate during a year, (ii) "volatility of exchange rate changes" defined as the standard deviation of the monthly percentage changes in the nominal exchange rate during a year, and (iii) "volatility of reserves" defined as the average of absolute monthly changes in the non-gold reserves, normalized by the reserve money in the previous month. We expect fixed regimes to have low values for "volatility of exchange rates", low values for "volatility of exchange rate changes" and high values for "volatility of reserves". On the other hand flexible regimes should combine high values for "volatility of exchange rates" and "volatility of exchange rate changes" with low values for "volatility of reserves".

{Insert Table 1}

The estimated values of volatility of exchange rates, volatility of exchange rate changes and volatility of reserves for Turkey reported in columns 4-6 in Table 1 for 1980-2003 reveal that the volatility of exchange rates and volatility of exchange rate changes during 1981-1990 and during 2000 have been rather low. During the period 1980-1988 when Turkey tried to achieve annual RER devaluation of about 6 percent, the volatility of reserves has been rather low. On the other hand during 2000 when Turkey followed a semi currency board arrangement the volatility of reserves has been relatively high.

The volatility of reserves started to increase after the liberalization of international capital movements in 1989. As the exchange rate became more and more market determined the volatility of exchange rates and volatility of reserves increased considerably during the periods 1991-1993 and also during 1995-2001. During the

as to permit the authorities an extra degree of flexibility in deciding the tactics to achieve a desired path. Under "other managed floats with no predetermined exchange rate path" exchange rate is influenced in a more ad hoc fashion.

crises periods of 1994 and 2001 the values of all the three measures increased enormously. During the period 2002-2003 the country has experienced relatively high values of volatility of exchange rates and volatility of reserves.

The above considerations reveal the difficulties in classifying the exchange rate regimes as fixed, intermediate and flexible regimes. The data show that policy makers have tried to use the exchange rate as a policy variable during the two periods of 1980-1988 and 2000. But during 1989-1999 and 2001-2003 the exchange rate was largely endogeneously determined together with the other variables in the system. During 1980-2003 as a whole Turkey has used mainly intermediate exchange rate regimes with considerable interventions in the exchange markets rather than the fixed or the flexible exchange rate regimes.

3. DEVELOPMENTS IN REAL EXCHANGE RATE

In order to study the developments in RER one has to decide first on the appropriate methodology for construction of the RER indices. Here one is faced with four decisions: choice of the price index, choice of the currency basket, choice of weights and choice of mathematical formula. In the formulation of the RER we use CPI as these data are available on a monthly basis for a large number of countries. Regarding the currency basket we consider countries which are major competitors of Turkey in world markets as well as major suppliers of imported commodities to Turkey. The countries considered consist of

- Western Europe: Belgium, France, Germany, Greece, Italy, Netherlands, Portugal, Spain, Switzerland and UK
- America: Brazil, Canada, Mexico and the US
- Middle East and North Africa: Egypt, Iran, Syria, Tunisia
- Central and Eastern European and Commonwealth of Independent States Countries: Czech Republic, Hungary, Poland, Russia
- Asia: China, Indonesia, Japan, Korea, Malaysia, Taiwan, Thailand.

For determining the weights of different countries we use the approach developed by Zanello and Desruelle (1997). According to their approach overall trade weights are derived by combining the bilateral import weights with the double export weights, using the relative size of Turkish imports and exports in overall Turkish trade to average both sets of weights. One can put these in formal terms as

$$\text{Import weight: } w_i^m = (M_i / M)$$

$$\text{Export weight: } w_i^x = \left(\frac{X_i}{X} \right) \left(\frac{y_i}{y_i + \sum_h X_h^i} \right) + \sum_{k \neq i} \left(\frac{X_i^k}{X} \right) \left(\frac{X_i^k}{y_k + \sum_h X_h^k} \right)$$

$$\text{Overall weight: } w_i = \left(\frac{M}{X + M} \right) w_i^m + \left(\frac{X}{X + M} \right) w_i^x$$

where M_i denotes imports of Turkey from country i , M total value of Turkish imports, X_i Turkish exports to country i , X total value of Turkish exports, y_i value of domestic manufacturing production for home market of country i , and X_i^k exports of country k to country i . Finally, the formula used for estimation of the RER is given by:

$$RER = \prod \left[\frac{CPI_i / E_i}{CPI / E} \right]^{w_i}, \text{ where } \prod \text{ stands for the product sign, } i \text{ is the index that runs}$$

over the country's trade partners, E_i is the exchange rate defined as domestic currency per unit of US Dollar of country i , E is the TL/\$ exchange rate and w_i the competitiveness weight attached by Turkey to country i calculated using the method of Zanello and Desruelle (1997).

Figure 2 shows the time path of the RER over the last two decades. The figure reveals that there are four episodes. After the foreign exchange crisis of late 1970's the RER started to depreciate sharply with the stabilization measures of 1980. It kept depreciating until 1988 and then it started to appreciate. Appreciation of the RER carried on until 1994 when the country was faced with another currency crisis. In 1994 RER depreciated sharply. But after a while RER started to appreciate again and appreciation of the RER carried on from April 1994 to February 2001 when the country was faced with the currency crisis of 2001. After the sharp depreciation of the RER during February 2001 to April 2001 it started to appreciate and in particular after after November 2001. The RER is still appreciating as of February 2004.

{Insert Figure 2}

To emphasize the extent of annual inflation and rate of depreciation of the nominal exchange rate we show in Figure 3 the time path of annual CPI inflation and the annual rate of depreciation of the exchange rate on a monthly basis. The figure reveals that the annual rate of depreciation of the exchange rate has exceeded substantially the annual rate of domestic inflation during the the periods of February 1980 - December 1984, January 1994 – February 1995 and February 2001 – March 2002. On the other hand the rate of inflation has exceeded substantially the rate of depreciation of the exchange rate during the periods of July 1989 – May 1991, March 1995 – March 1996, November 1997 – April 1999 and March 2002 to March 2004.

{Insert Figure 3}

4. CURRENT ACCOUNT AND THE REAL EXCHANGE RATE

We consider the non-interest current account (NICA) measured in million of US Dollars, where NICA is defined as current account plus interest payments on foreign

debt minus interest receipts.¹⁰ Using quarterly data for 1988:I to 2003:II we concentrate on the NICA/GDP ratio and note that one of the main determinants of this ratio is the RER. A second factor that strongly affects the NICA/GDP ratio is the aggregate demand for domestic goods and services consisting of total consumption plus investment demand in the home country as well as the rest of the world. As aggregate domestic demand for goods and services in the home country increases it triggers imports and, ceteris paribus NICA/GDP ratio is expected to decline. Similarly, as aggregate domestic demand for goods and services increases in the rest of the world it triggers imports of the foreign country and, ceteris paribus, NICA/GDP ratio in the home country is expected to increase.

In order to explain the developments in NICA, the following equation is estimated

$$(NICA/GDP) = \beta_0 + \beta_1 \text{dlog}(ADD) + \beta_2 \text{dlog}(ADDF) + \beta_3 \text{RER} + \hat{\alpha}_4 \text{DQ3} + \hat{\alpha}_5 \text{D1999} + \hat{\alpha}_6 \text{D93ST} + \hat{\alpha}_7 \text{D2000}$$

where $\text{dlog}(ADD)$ denotes the annual growth rate of real aggregate domestic demand in the home country, $\text{dlog}(ADDF)$ the annual growth rate of real aggregate domestic demand in the rest of the world, RER the real exchange rate, DQ3 the third quarter seasonal dummy, D1999 the recession and earthquake dummy for the year 1999 taking the value of 1 for quarters II to IV of 1999 and 0 otherwise, D93ST the structural break dummy in 1993 taking the value of 1 after 1993 and 0 otherwise, and D2000 taking the value of 1 for all quarters of 2000 and 0 otherwise. The D93ST dummy refers to the structural break in Turkey's balance of payments that took place after the liberalization of the capital account in 1990. Since economic agents respond with lag to such decisions, a series of tests were conducted to identify the structural break due to this decision. Finally, the D2000 dummy refers to the exchange rate based stabilization measures. All of the variables used in the estimation are checked for unit roots, and it has been found that the series are all stationary.¹¹ Because of the simultaneity problems faced in the model we use instrumental techniques to estimate the parameters. The results of the estimation are presented in Table 2. Diagnostic tests on residuals are given in the table. Since the DW test statistics falls in between the inconclusive area, we can conclude that there is no evidence of serial correlation in the residuals.

{Insert Table 2}

The coefficients of the variables are all statistically significant and all have the expected signs. An increase in the growth rate of aggregate domestic demand in the home country reduces the NICA/GDP ratio while an increase in the growth rate of

¹⁰ Monthly series on current account, interest payments and interest receipts exists since December 1984. But quarterly national income series are available since 1987.

¹¹ In order to deal with the simultaneity problem in a simple way four quarter lagged value of RER is used as instrumental variable.

aggregate domestic demand in the rest of the world increases the NICA/GDP ratio. The NICA/GDP ratio increases as the RER depreciates. The coefficient of the structural change dummy is negative, which indicates that liberalization of the capital account had a negative impact on NICA/GDP ratio, which is expected.

5. CURRENT ACCOUNT SUSTAINABILITY AND THE EQUILIBRIUM REAL EXCHANGE RATE

The basic presumption of our approach is that the current account must be sustainable. If not, then the country is expected to face an exchange rate collapse or an external debt default which in turn will imply a reduction in real income and employment, deviating from the long run growth path. Starting from the notion that under current account sustainability the country must satisfy its lifetime budget constraint, we say that the current stance of policies are sustainable if the continuation of the current government policy stance and private sector behavior into the future does not entail a drastic policy shift or lead to a currency or or balance of payments crisis

To emphasize the points stressed above consider the balance of payments relation which can be written as

$$TB_t^s - i^*D_{t-1} + FDI_t + D_t - D_{t-1} - \Delta R_t = 0$$

where TB_t^s denotes non-interest current account, D stock of foreign debt, i^* the foreign rate of interest, FDI net foreign direct investment, R foreign exchange reserves of the country, $(TB_t^s - i^*D_{t-1}) = Current\ Account_t$, $(FDI_t + D_t - D_{t-1}) = Capital\ Account_t$, and ΔR_t the change in reserves. All variables are measured in terms of foreign currency. Letting $d_t = \frac{E_t D_t}{P_t Y_t}$ be the foreign debt to

GDP ratio, $tb_t = \frac{E_t TB_t^s}{P_t Y_t}$ non-interest current account to GDP ratio (NICA/GDP),

$fdi_t = \frac{FDI_t E_t}{P_t Y_t}$ foreign direct investment to GDP ratio, and $\Delta r_t = \frac{\Delta R_t}{P_t Y_t}$ the change in

reserves to GDP ratio, the equation determining the time path of d_t can be written as

$$d_t = -tb_t + \frac{(1+r^*)(1+h)}{(1+g)}d_{t-1} - fdi_t + \Delta r_t$$

where r^* denotes foreign real rate of interest and η the rate of depreciation of the RER. The equation shows that external debt to GDP ratio decreases with increases in non-interest current account to GDP ratio tb , foreign direct investment to GDP ratio fdi , and growth rate of GDP g . On the other hand the debt to GDP ratio increases with

increases in foreign real interest rate r^* , rate of depreciation of the RER η and changes in reserves to GDP ratio Δr .

Following the approach of von Hagen and Harden (1994) we solve this expression forward for n periods and obtain

$$d_t = E_t \mathbf{d}_{t,n} d_{t+n} + E_t \sum_{i=1}^n \mathbf{d}_{t,i} A_{t+i}$$

where

$$\mathbf{d}_{t,k} = \prod_{i=1}^k \frac{1+g_i}{(1+r_i^*)(1+h_i)}$$

$$A_d = tb_t + fdi_t - \Delta r_t.$$

Here, $\mathbf{d}_{t,k}$ can be interpreted as the k -periods ahead discount factor used to calculate the present value of assets and liabilities in period $t+k$ for period t . $E_t x_{t+k}$ denotes the period t expectation of the variable x in period $t+k$. The equation shows that current debt to GDP ratio equals the expected discounted present value of foreign debt outstanding in period $t+n$ relative to GDP plus the sum of all discounted A_t 's between period t and period $t+n$. Theoretically, the intertemporal budget constraint requires that $\lim E_t \mathbf{d}_{t,n} d_{t+n} \leq 0$ as n becomes very large, so that foreign debt remains bounded relative to GDP. If the intertemporal budget constraint was violated, the price of the debt of the country would fall to zero and the country would see itself barred from international capital markets.

To translate the intertemporal budget constraint into a practically more relevant requirement we consider the above relation for a limited period of time n^* . We consider the period 1984-2003 and use actual data on d_t , tb_t and fdi_t for any year during the time interval 1984-2003. For each year t of the time period 1984-2003 we estimate the expected discounted present value at time t of foreign debt outstanding in period $t+n^*$ relative to GDP plus the sum of all discounted A_t 's between period t and period $t+n^*$. Regarding the government policy stance and the private sector behavior over the period t to $t+n^*$ we assume that the values of tb_{t+i} and fdi_{t+i} for $i = 1 \dots n^*$ will remain unchanged at their initial values tb_t and fdi_t . Thus, we assume that the government, private sector and rest of the world will not change their policies they pursue in period t over the time period $t+1$ and $t+n^*$. Furthermore, we assume that at the end of the period $t+n^*$ the debt to GDP ratio will return to its initial value at time t , i.e. $d_{t+n^*} = d_t$.

Consideration of the Turkish annual growth rate of GDP over the period 1980-2003 reveals that the average growth rate of GDP has amounted to 4.1 percent during 1980-

1989, and to 3.7 percent during 1990-2003. Hence, for the growth rate of GDP over the time period t to $t+n^*$ we take the figure of 4 percent. On the other hand we consider the foreign real interest rate to equal 8 percent over the time period t to $t+n^*$.¹² Finally, we assume in the following calculations that $\Delta r=0$ for each year of the period t to $t+n^*$ and that over the same time period η equals zero.

We say that current account is sustainable if the ratio

$$I_t = (E_t d_{t,n} d_{t+n} + E_t \sum_{i=1}^n d_{t,i} A_{t+i}) / d_t$$

is at least as large as unity. Here d_t denotes the actual debt to GDP ratio in period t and $A_{t+i} = (tb_t + fdi_t)$ for $i = 1 \dots t+n^*$. The result of calculations for $n^* = 10$, $n^* = 20$ and $n^* = 25$ are shown in Table 3.

{Insert Table 3}.

The table reveals that during 1984 current account was unsustainable in the sense that the actual debt to GDP ratio in 1984 exceeded the expected discounted present value of foreign debt outstanding in period 2009 relative to GDP plus the sum of all discounted A_t 's between period 1984 and period 2009. This indicates that current account needed adjustment in NICA/GDP and FDI/GDP ratio. During the following years Turkey has increased the NICA/GDP ratio considerably, but there was not much change in FDI/GDP. The table indicates that the policy has been successful and that country reached closer to sustainability in 1987. The ratio exceeded unity during 1988 and 1989. The warning signals for the 1994 currency crisis can be seen from the negative figures of the ratio for 1993. The situation improved after the crisis when λ increased above unity in 1994, but after 1994 the current account was again unsustainable. The value of λ for the year 2000, the year before the currency crisis of 2001, was again negative. Although the sustainability of the current account improved in 2001, the system was not sustainable again in 2002 and 2003. .

Consideration of the value of λ for 2003 reveals that the ratio equals 11 percent when $n^* = 25$. Thus, the actual debt to GDP ratio in 2003 equals only 11 percent of the sum of the expected discounted present value of foreign debt outstanding in period 2028 relative to GDP and the sum of all discounted A_t 's between period 2003 and period 2028. The system is not sustainable. The sustainability of the current account requires that the value of λ be increased to unity. This can only be achieved through either an increase in NICA/GDP ratio tb_t or through an increase in FDI/GDP ratio fdi_t during the period 2004 to 2028 or through a combination of increases in both NICA/GDP and FDI/GDP ratios during the same time period.

In 2003 the actual value of $A_t = (tb_t + fdi_t)$ equaled -1.075 percent. On the other hand the value of A_t for t during the period from 2004 to 2028 that will make Turkey

¹² See e.g. (OECD, 2002).

achieve external sustainability with $\lambda = 1$ is 2.354 percent.¹³ Thus, Turkey has to increase the sum of its non-interest current account/GDP and FDI/GDP ratio over the period 2004 to 2028 by 3.429 percent. Suppose that fdi_t during the time period 2004 to 2028 stays constant at its 2003 level of 0.029 percent.¹⁴ Then the increase in tb_t and hence in A_t during the period 2004 to 2028 can be achieved by depreciating the RER and keeping the RER at its “long run equilibrium level” over time.¹⁵ To determine the extent of depreciation in RER we consider the regression equation reported in Table 2. From that table it follows that the RER has to increase from its level attained in September 2003 by about 114 percent and kept around that level over time.

Consider now the issue of increasing the FDI/GDP ratio. Here we note a striking feature of foreign direct investment flows to Turkey. The level is too low relative to FDI flows to developing countries with similar levels of GDP per capita. In particular, the FDI flows to Central and Eastern European countries are much larger than those to Turkey. However, in terms of population, Turkey is larger than Poland, Czech Republic and Hungary combined. In terms of GDP, Turkey’s economy is four times as large as that of Czech Republic or Hungary, and one quarter larger than Poland in

¹³ The above considerations were based on the idea that under external sustainability the actual debt to GDP ratio d_t in period t be equal to the sum of expected discounted present value of foreign debt outstanding in period $t+n^*$ relative to GDP and the sum of all discounted A_t ’s between period $t+1$ and period $t+n^*$. Alternatively, one can narrow the condition for sustainability to the requirement that the ratio of net stock of foreign liabilities to GDP stays constant over time at its initial value. In that case the equation determining the time path of debt to GDP ratio d can be solved for the equilibrium value of the sum of tb and fdi under the assumption that $\Delta r=0$ as:

$$(tb + fdi) = - \left[\frac{(g - r^* - h - r^*h)}{(1 + g)} \right] d .$$

Assuming that η equals zero and setting the value of $g = 0.04$, $r^* = 0.08$ and $d = 0.612$ of the year 2003 the equilibrium value of $(tb + fdi)$ is determined as 2.354 percent. The figure is in fact not different from the figure we found earlier. Thus for $n^* = 25$ the two approaches yield the same solution.

¹⁴ During 2003 inward and outward FDI flows amounted to 0.239 and 0.21 percent of GDP respectively. Thus the net FDI inflow was only 0.029 percent of GDP.

¹⁵ ¹⁵ In the literature there are basically two approaches to the determination of the long run equilibrium value of the RER. According to Williamson (1994) and Wren-Lewis and Driver (2000) the fundamental equilibrium exchange rate (FEER) is the real exchange rate that would exist when the economy is at full employment (internal balance) and in current account equilibrium (external balance). Thus, FEER is the RER which will bring the current account into equality with the “sustainable” capital account, where home and foreign aggregate outputs are set at their full employment values. On the other hand, Clark and MacDonald’s (1998) model of behavioral equilibrium exchange rate (BEER) analyzes the actual behavior of RER with econometric techniques, where the reduced form equation is estimated with assumed longer term fundamentals and short term variables using cointegration analysis. MacDonald and Stein (1999) and Hinkle and Montiel (1999) consider as fundamental variables productivity and net foreign assets. Other variables identified in the literature include real interest differentials, measures of openness of trade and exchange system and size of fiscal balance. Finally, we note that Stein and Allen (1995) distinguish between medium and long-term factors influencing the RER. The approach developed in this paper can be considered as an extension of the FEER approach. Instead of imposing the equality of the current account with the sustainable capital account, we require that the NICA/GDP ratio be sustainable.

2000, and in terms of gross fixed capital formation Turkey's investments during 2000 are 3 to 4 times larger than Czech Republic and Hungary, and roughly a sixth larger than Poland. In terms of average annual inflows of FDI during the 1990s, the level of FDI inflows that Turkey has been attracting, at USD 800 million, is roughly one-fifth of FDI inflows to Poland, at 4.1 billion, and also significantly lower than Czech Republic and Hungary, each attracting roughly 2.1 billion per annum.

To explain the factors determining the FDI flows we first define the investment climate in the country as the policy, institutional and behavioural environment, present and expected, that influences the perceived returns and risks associated with investment in terms of both quantity and productivity of investment flows. Investment climate thus defined depends on a wide array of factors that can be grouped under the headings of (i) macroeconomic and trade policies, (ii) infrastructure, and (iii) governance and institutions. Although Turkey has an open trade regime it was unable to attract large FDI inflows. One of the main culprits behind this failure was the uncertain macroeconomic environment. As a result of the uncertainties stemming from domestic politics, the macroeconomic environment and the ensuing high real interest rates, the country followed a very erratic growth performance. Turkey throughout the last two decades, had put many decisions that could help foreign investors cope with high inflation on hold. One of the critical measures that Turkey did not introduce has been the inflation accounting framework in the context of high inflationary environment. Besides the macroeconomic aspects there are also infrastructure related factors. Although the quantity and quality of Turkey's broadly-defined infrastructure, including geographical and demographical endowments, and physical and financial infrastructure help position Turkey as a potentially powerful magnet for FDI inflows, these factors also did not help Turkey to attract increased amounts of FDI flows. The main bottlenecks as emphasized by Dutz et al. (2003) seem to be insufficient respect for the rule of law and weak competition in local markets, reinforced by uneven application of bureaucratic red-tape. Turkey, in order to attract higher levels of FDI flows in the future, has to improve not only its macroeconomic environment but also increase the respect for the rule of law, increase competition in local markets, and reduce the bureaucratic red-tape.

Once Turkey will be able to attract higher levels of FDI into the country it does not need to depreciate its currency by as much as 114 percent in order to attain sustainability in its current account. Table 4 shows the required rates of depreciation of the RER for different values of the FDI/GDP ratios. With increases in FDI/GDP ratios the required rate of depreciation of the RER in order to attain sustainability in the current account decreases. When the FDI/GDP ratio increases to 3.5 percent of GDP then the system becomes sustainable and there is no need to depreciate the RER over time. But this will require that FDI/GDP ratio be kept at 3.5 percent of GDP over time.

{Insert Table 4}

Lastly, turning to the question of the appropriate exchange rate regime for Turkey we note that majority of countries in the world are moving towards fixed or freely floating exchange rates. As noted by Buiter and Grafe (2002) there are only two exchange rate regimes that are sustainable in the long run. These are the free floating exchange rate and a symmetric monetary union, which is defined to be a monetary union with a monetary authority satisfying the following conditions: (i) its mandate spans the entire monetary union, (ii) it acts as lender of last resort on the same terms in every union member state, (iii) seigniorage is shared fairly among all union member states, and (iv) it is accountable to the legitimate political representatives of the citizens of the whole union.¹⁶ To join a monetary union with fixed exchange rate the country has to resolve its fiscal problems, attain price stability, achieve a sound banking sector, and its current account is sustainable. Until these conditions are satisfied Turkey should avoid adopting a fixed or semi-fixed exchange rate regime, and thus should not consider any regime other than the flexible exchange rate regime. Currency board arrangements and euroization should not be the alternatives for Turkey.¹⁷ Thus, a viable exchange rate regime for Turkey in the near future seems to be the dirty float. Here one should note that the equilibrium level of the RER needs to be achieved gradually over time. Sharp depreciation of the RER should be avoided as domestic firms in Turkey as of the beginning of 2004 have accumulated large foreign exchange liabilities. Under these circumstances, a sharp devaluation would provoke massive bankruptcies, generating large social costs. The crisis of February 2001 is a case in point.¹⁸

¹⁶ Here we note that European Monetary Union (EMU) is such a symmetric monetary union which has strict conditions on fiscal policy. The budgetary decisions by member countries are subject to surveillance by the Union as a whole in the context of the requirements set out in the Maastricht Treaty and subsequently the Stability and Growth Pact.

¹⁷ During the period prior to the collapse of its currency regime in 2001 Turkey did have a regime very close to the currency board. The system failed as Turkey did have neither a sound fiscal framework nor a sound banking sector and had not attained price stability. Furthermore, it did not have a graceful exit strategy.

¹⁸ We should note that sharp depreciations can not be prevented by central banks if they find themselves playing against rest of the market participants. Therefore, in order to smoothen the reactions of the market participants, measures should be taken to affect the expectations of market participants in the desired direction.

We note that a sharp depreciation in RER may occur also due to changes in the sentiment in the foreign exchange market, especially when the market is “thin” and “shallow”. In shallow foreign exchange markets, instinctive reactions of few market participants to an event may lead to sharp changes in the nominal exchange rate, as was witnessed during the crisis episodes in Turkey. When the nominal exchange rate exhibits such a sharp movement, the uncertainty it creates leads the market participants either to shy away from engaging in any foreign exchange contracts leading to an even thinner foreign exchange market or to position themselves at the “excess side” of the market, thereby aggravating the movement in the nominal exchange rate in a shallower foreign exchange market. If this episode continues sufficiently long the nominal exchange rate becomes sticky at its new level and, therefore, the damaging effects of the sharp changing RER on the economy will be materialized. In order to avoid such an outcome, under such circumstances the central bank can, and should, act as a market maker, in the foreign exchange market. Central bank should have the skill and credibility to convince the market participants concerning its intention behind such an intervention.

V. CONCLUSION

During the last two and half decades Turkey has suffered from three foreign exchange crisis resulting in considerable loss of income and in the creation of substantial social and political stresses within the country. The paper argues that the country in order to avoid the occurrence of foreign exchange crisis has to ensure that over time the sum of NICA to GDP and FDI to GDP ratios be at least be as large as the sustainable value of the sum of NICA to GDP and FDI to GDP ratios. In order to attain sustainability in its current account the country should pursue policies that will improve the business climate in the country so that FDI inflows into the country will increase over time and also keep the RER close to its long run equilibrium level.

Under perfect capital mobility there will always be the unavoidable risk of speculative attacks on the currency unless the country resolves its fiscal problems, attains price stability, and achieves a sound banking sector. A further requirement for avoiding the occurrence of currency crises is the condition that the RER should not deviate considerably from its long run equilibrium value.

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Figure 1:

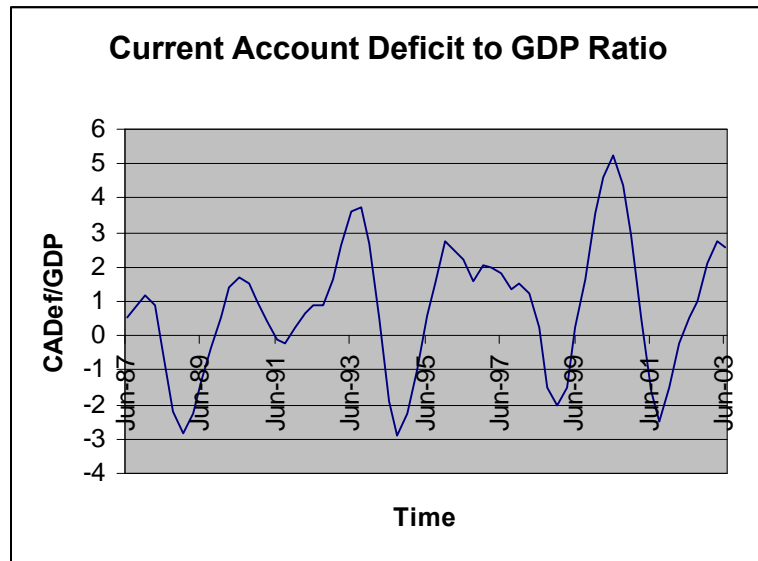


Figure 2

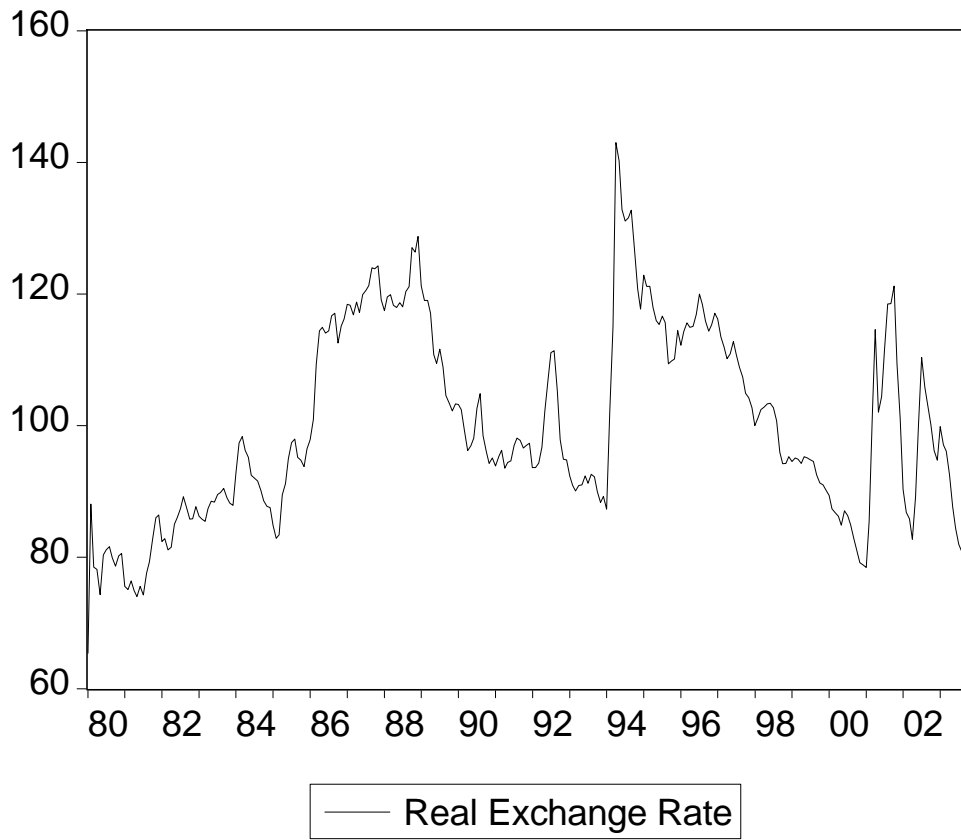
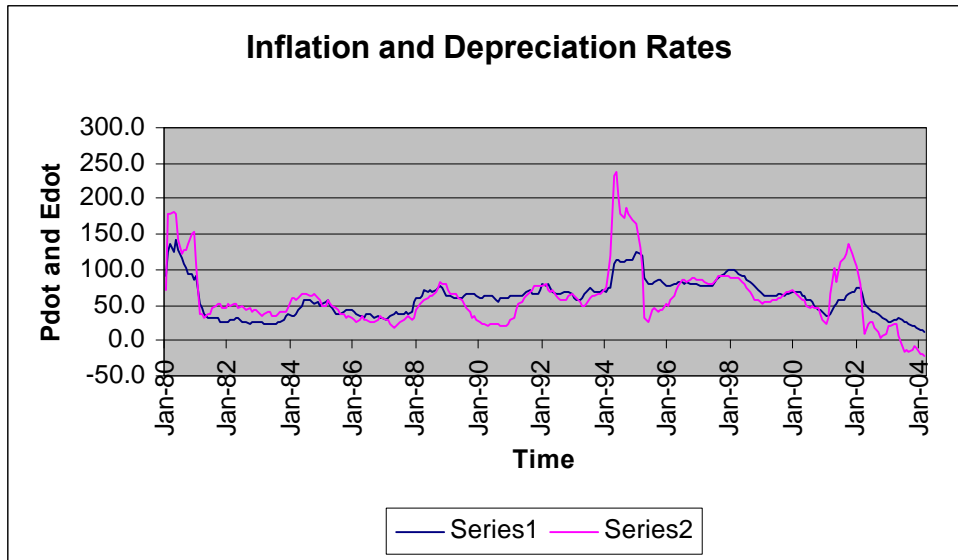


Figure 3: Annual Inflation and Annual Rate of Exchange Rate Depreciation



Note: The dark line shows the annual rate of inflation and the pink line the rate of depreciation of the TL/\$ exchange rate.

Table 1: Exchange Rate Regimes of Turkey

	IMF Old Classification (1)	IMF New Classification (2)	Classification of Babula and Otker (3)	Volatility of Exchange Rates Annual	Volatility of Exchange Rate Changes	Volatility of Reserves
1980	(ii)			9.167	18.019	1.972
1981	(ii)			3.254	2.237	3.131
1982	(iii)			2.995	1.865	2.446
1983	(iii)			3.245	1.379	1.801
1984	(iii)			3.950	2.547	2.543
1985	(iii)			2.360	1.769	1.550
1986	(iii)			2.472	2.261	2.583
1987	(iii)			2.391	1.154	1.825
1988	(iii)			5.080	2.108	2.832
1989	(iii)			2.149	1.186	4.079
1990	(iii)		9	1.834	0.978	2.816
1991	(iii)		9	4.854	2.929	4.688
1992	(iii)		9	4.296	2.142	4.776
1993	(iii)		9	4.433	1.579	3.553
1994	(iii)		7	10.770	15.141	8.115
1995	(iii)		9	3.579	2.515	14.266
1996	(iii)		9	5.222	1.245	8.618
1997	(iii)		9	5.538	0.944	8.913
1998	(iii)		7	3.659	1.812	12.500
1999		IV	7	4.618	1.373	5.658
2000		IV	7	2.323	1.102	8.480
2001		VIII	13	9.773	8.080	13.553
2002		VIII		3.247	3.310	7.190
2003				3.132	2.007	9.554
				4.347	3.320	5.727

Notes:

1. The three regimes are: (i) pegged regimes, (ii) regimes with limited flexibility, and (iii) more flexible arrangements
2. The eight regimes are: (I) dollarization and euroization, (II) currency board, (III) conventional fixed pegs, (IV) horizontal bands, (IV) crawling pegs, (VI) crawling bands, (VII) managed floats with no preannounced path for the exchange rate, and (VIII) independent float
3. The thirteen regimes are: (1) formal dollarization and euroization, (2) currency union, (3) currency board arrangements, (4) conventional fixed pegs vis-a-vis single currency, (5) conventional fixed pegs vis-a-vis a basket of currencies, (6) horizontal bands, (7) forward looking crawling pegs, (8) backward looking crawling pegs, (9) forward looking crawling bands, (10) backward looking crawling bands, (11) tightly managed floats, (12) other managed floats with no predetermined exchange rate path, and (13) independently floating.

Table 2: Results for the Quarterly Instrumental Variable Regression of NICA/GDP

Variable	Coefficient	t-Statistic
C	-2.56863	-1.41186
d log (Agg. Dom. Demand in Home Country)	-29.89038	-12.12362
d log (Agg. Dom. Demand in Foreign Country)	38.84045	1.95129
Real Exchange Rate	0.03719	1.97118
DQ3	1.84541	4.52182
D1999	-3.82977	-4.34096
D93ST	-0.91545	-2.34142
D2000	-2.72463	-3.18816
R-squared	0.82106	
Adjusted R-squared	0.79787	
Durbin-Watson stat*	2.14602	

Table 3: Current Account Sustainability

	10 years	20 years	25 years
1984	0.730	0.546	0.476
1985	0.858	0.761	0.724
1986	0.801	0.664	0.613
1987	0.952	0.919	0.907
1988	1.564	1.950	2.095
1989	1.434	1.732	1.844
1990	0.753	0.584	0.521
1991	1.258	1.435	1.501
1992	1.016	1.027	1.031
1993	0.310	-0.163	-0.341
1994	1.409	1.690	1.795
1995	0.755	0.587	0.524
1996	0.726	0.537	0.467
1997	0.755	0.587	0.524
1998	1.135	1.228	1.262
1999	0.864	0.770	0.735
2000	0.258	-0.251	-0.441
2001	1.433	1.730	1.842
2002	0.865	0.772	0.737
2003	0.542	0.228	0.110

Source: Own calculations

Table 4: Sustainable Combinations of FDI/GDP, NICA/GDP and REF

FDI/GDP Percent	Required Change in NICA/GDP	Required Rate of Depreciation of the RER
0.0291	3.400	113.9226
0.5	3.379	113.2222
1	2.429	81.3939
1.5	1.929	64.6422
2	1.429	47.8905
2.5	0.929	31.1387
3	0.429	14.3870
3.5	-0.071	-2.3647

Source: Own calculations

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Zentrum für Europäische Integrationsforschung
Center for European Integration Studies
Rheinische Friedrich-Wilhelms-Universität Bonn

Walter-Flex-Strasse 3
D-53113 Bonn
Germany

Tel.: +49-228-73-1732
Fax: +49-228-73-1809
www.zei.de