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## I. EXPORT PERFORMANCE AND EXTERNAL COMPETITIVENESS IN FYR MACEDONIA<sup>1</sup>

### A. Introduction

1. **Sustaining faster growth and reducing unemployment in a small open economy like FYR Macedonia depends on improving export performance.** Improving export performance can also help preserve macroeconomic stability by closing the current account gap to avoid losing reserves and to contain the growth of external debt.
2. **Improving export performance requires enhancing competitiveness.** In the short run, competitiveness can be associated with the level of the real exchange rate that ensures both internal and external balance, known as the fundamental equilibrium exchange rate (FEER). In the long run, the real exchange rate is supposed to converge to its equilibrium level and competitiveness is more related to the productivity of the economy. The two concepts of competitiveness can be referred to as “price competitiveness” and “structural competitiveness.”<sup>2</sup>
3. **This paper concludes that while the level of price competitiveness is broadly appropriate at present, FYR Macedonia faces important structural competitiveness problems.** The paper is organized as follows. Section B describes the trends in the current account balance and external vulnerabilities. Section C analyzes export performance. Section D uses different approaches to estimate the equilibrium real exchange rate, and so to assess competitiveness. Section E concludes.

### B. Current Account Balance and External Vulnerabilities

4. **Large and persistent current account deficits in FYR Macedonia have pointed to a competitiveness problem, although recent improvements have eased these concerns.** From 1995-2004, the current account deficit averaged 6.3 percent of GDP (Figure 1). In the first half of this period, the average trade deficit was close to 13 percent of GDP. In the second half, the increase in private transfers fueled imports and the trade balance deteriorated to 19 percent of GDP. While exports increased by 4 percent of GDP during 2000-2004, imports increased by almost 10 percent of GDP. In 2005, the current account deficit fell

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<sup>1</sup> Prepared by Eva Gutierrez.

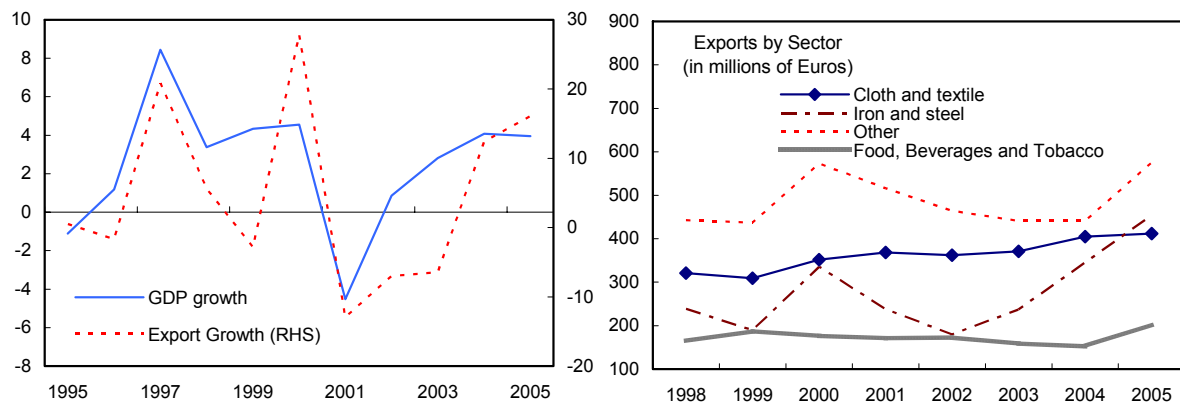
<sup>2</sup> Competitiveness is an elusive concept, with many definitions in the economics literature. One of the most straightforward, used by the World Economic Forum, equates competitiveness with the ability of a country to achieve sustained high rates of growth in GDP per capita. A similar but more detailed definition, supplied by the OECD, is that competitiveness is the degree to which a nation can, under free trade and fair market conditions, produce goods and services which meet the test of international markets, while simultaneously maintaining and expanding the real incomes of its people over the long-term.

sharply to 1.3 percent of GDP despite the 40 percent increase in private transfers and higher oil prices. The strong broad-based export growth and moderation in import growth in 2005 suggests an improvement in competitiveness.

5. **External vulnerabilities have increased during the last ten years due to the large current account deficits, although external debt levels remain manageable.** From 1995 to 2004, the sharp increase in external debt is explained by the large current account deficits and the need to accumulate reserves (Figure 1). The political crisis of 2001 dried up external financing and the large current account deficits caused a steady decline in the reserve coverage ratio. While capital inflows recovered from 2004 onwards, the decline in the coverage ratio was only reversed in 2005, due to the sizeable improvement in the current account deficit.

### C. Export Performance

6. **The political crisis of 2001 worsened export performance and growth.** During 1995-2000, the average growth of exports (9.5 percent) raised the share of exports in GDP from 32 to 46 percent. However, the political crisis of 2001 resulted in a severe contraction in output and exports that lasted until 2004. Only in 2005 has the export share of GDP returned to its pre-crisis level.

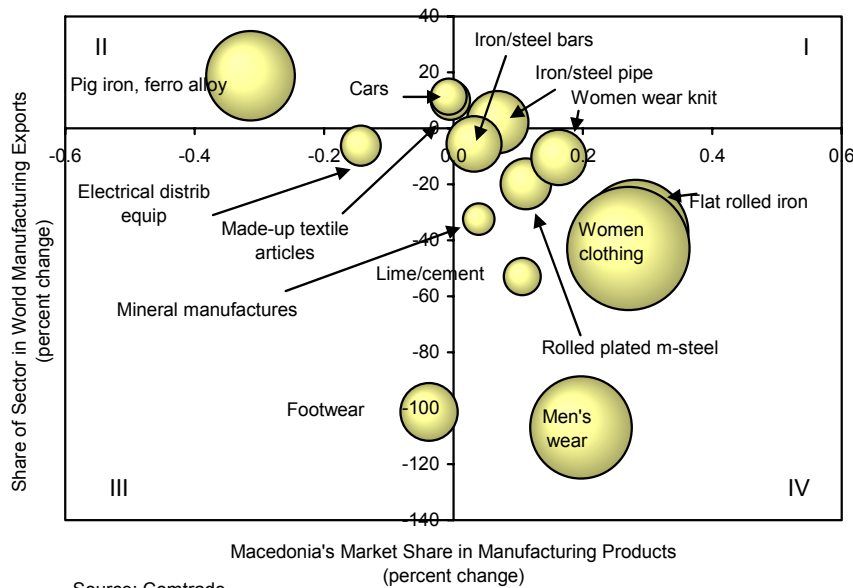


Source: Macedonia State Statistical Office.

7. **Exports of iron and steel and “other” exports are the main drivers of the recent improvement in export performance.** Macedonian exports are highly concentrated. Exports of iron and steel, textiles, and food beverages and tobacco account for about 60 percent of the total. During the 2001 crisis, exports fell in all sectors (except for textiles). The reopening of a large steel factory in 2004 and the removal of protectionist barriers in Serbia to imports of certain refined oil products in 2005 explain the recovery in the iron and steel sector and in “other” exports.

8. **Nevertheless, Macedonian exports have lost market share since 1995.** Unlike most other countries in the region, FYR Macedonia has lost market share in world imports since 1995, and especially in the US market (Figure 2). While there has been an improvement since 2004, export shares have yet to reach their 1995 levels.

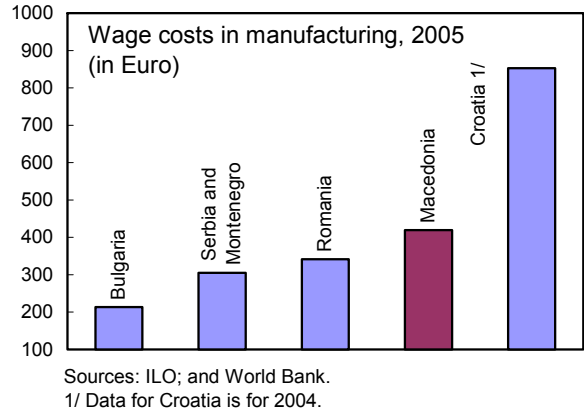
9. **Detailed analysis of Macedonian manufacturing exports suggests that the loss of competitiveness is to a large extent due to patterns of specialization.** Using export data from the Comtrade database (3 digit sector level) we looked at the evolution of the market share of Macedonian exports in the 15 largest manufacturing sectors—accounting for 80 percent of Macedonian manufacturing exports in 2005—from 1995 to 2004. We compared this to the evolution of the share of these sectors in the total world manufacturing exports. The sectors in the bottom two quadrants are those whose share in total world exports of manufactures has declined. The sectors in the two right quadrants are those where Macedonia's export share has increased. The graph indicates that the share of Macedonian exports has increased in most of the main manufacturing sectors in which the economy is specialized. However, these are sectors with a declining share in world manufacturing trade, and this explains why FYR Macedonia's exports have also declined as a share of world exports.



## D. Assessing Competitiveness

### Indicators of Wage and Cost Competitiveness

10. **Although data heterogeneity makes cross-country comparisons difficult, wages in FYR Macedonia appear higher than in other Balkan countries.** Wage costs in manufacturing are higher in Macedonia than in other countries in the region. While productivity differentials might explain to some extent cross-country variations in wages, wage costs in Macedonia are twice as high as in Bulgaria, and about 40 percent higher than in Serbia. Only Croatia has higher wage costs than Macedonia.



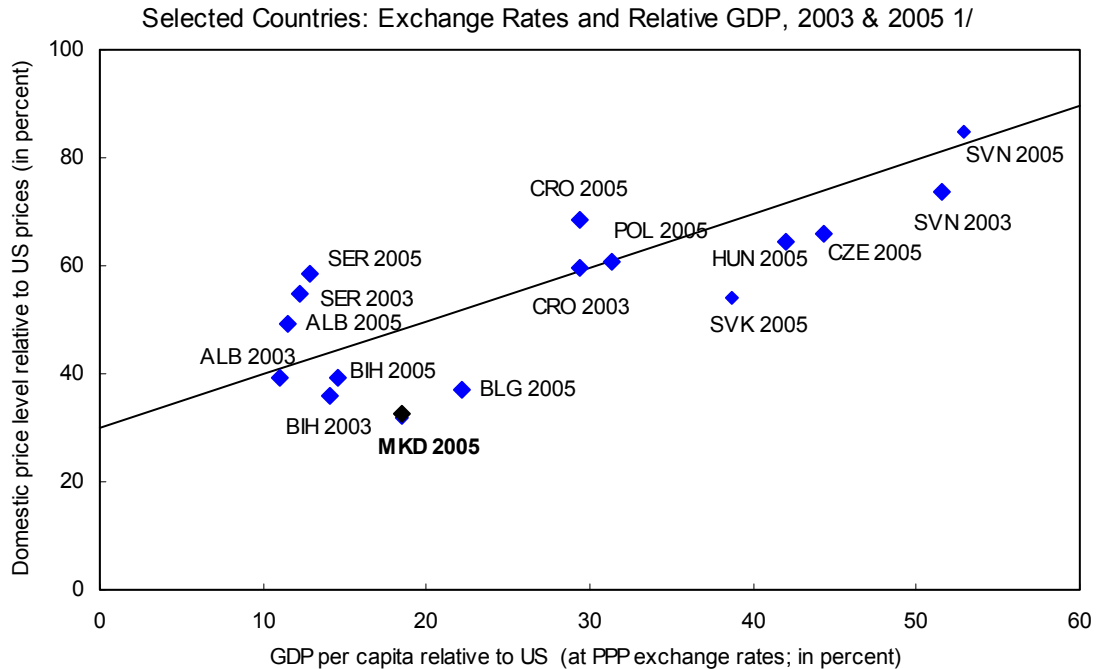
11. **In contrast, real exchange rate indicators show that price competitiveness has improved in the last decade.** Though the 1997 devaluation resulted in a sharp real depreciation, it did not noticeably affect the average current account deficit—in the absence of negative terms of trade shocks—or stop the decline in export shares (Figure 3). After the devaluation, the real exchange rate appreciated mostly due to the substantial depreciation of the Serbian denar. However, relative prices have since declined because—unlike most transition economies—sustained appreciation due to Balassa-Samuelson effects has not materialized, and the real exchange rate is again close to its post-devaluation levels.<sup>3</sup> The unit labor cost labor measure of the real exchange rate shows a considerable improvement due to the decline in relative unit costs in manufacturing, where productivity gains have outpaced wage increases.

### Estimates of the Equilibrium Real Effective Exchange Rate (REER)

12. **Estimates of the equilibrium real exchange rate tend to be quite sensitive to the methodology used, and are particularly challenging in transition economies due to data limitations.** This paper tries to answer the question of whether the REER is in line with macroeconomic fundamentals through using three different methodologies: the PPP approach, the macroeconomic balance approach, and econometric techniques.

<sup>3</sup> Analysis from the NBRM suggests that productivity in the nontradable sector grew faster than in the tradable sector.

13. **The exchange rate in FYR Macedonia is undervalued with respect to its PPP level.** The exchange rate index calculated on a purchasing parity power basis—measured as the ratio of the domestic price level to international prices—is currently below what would be predicted given Macedonia’s relative income.



Sources: IMF, World Economic Outlook; and staff calculations.

1/ Line derived from a regression of PPP exchange rates (domestic prices relative to US prices) and real GDP per capita, in PPP terms, for 179 countries, based on 2005 data.

14. **Estimates of the equilibrium real exchange rate using the macroeconomic balance approach suggest that, at present, the exchange rate is broadly appropriate.** This methodology involves: (i) estimating the underlying current account, which is the actual current account adjusted for existing output gaps (both domestic and foreign) and for effects of lagged real exchange rate movements, and (ii) comparing this underlying current account to the structural current account balance, derived from a model of equilibrium saving-investment balances.<sup>4</sup> In the case of FYR Macedonia the estimated underlying current account balance ranges between 0 and -3.1 percent, depending on the amount of officially recorded private transfers that are treated as true current account transactions. We estimate the structural current account balance to be around -2 percent of GDP, substituting the values for FYR Macedonia in the equation estimated by Chinn and Hito (2005). Using the export and import elasticities estimated by Isard et al. (2001), the real exchange rate would have to

<sup>4</sup> See Appendix I for details.

depreciate by at most 4 percent to bring the underlying current account in line with the structural current account. Since this is modest and within the margin of error, this suggests that the real exchange rate is broadly in line with fundamentals.

Current account Balance (2005)	-1.3	-1.3
Adjustments	1.3	-1.7
Private Transfers	0.0	-3.0
Trade Response to Output Gaps	-1.8	-1.8
Trade Response to past REER depreciation	3.1	3.1
Underlying Current Account	0.0	-3.1

15. **Econometric estimates of structural determinants also suggest that the exchange rate is not out of line with fundamentals.** Taking the real interest parity condition as a starting point, we estimated the equilibrium real exchange rate in terms of structural fundamentals using a vector error correction framework.<sup>5</sup> In line with economic theory,

	1995q3-2005q4	1998q3-2005q4
Fiscal Expenditure	0.02 [-5.3]	0.01 [-4.6]
Relative productivity	2.74 [-9.3]	1.98 [-7.6]
Openness	-0.01 [ 8.4]	0.00 [ 5.7]
Constant	3.68	4.02

T-statistics in brackets.

higher government consumption and productivity gains are assumed to appreciate the equilibrium real exchange rate while increased openness tends to depreciate it. Using Hodrick-Prescott filters of these fundamental determinants of the real effective exchange rate as proxies for their equilibrium values, we estimated the equilibrium real exchange rate for FYR Macedonia using different time periods because of data availability. The results of the different estimates were broadly similar. Increased openness, the decline in government consumption and, in particular, movements in relative productivity explain the trend decline in the real exchange rate. If relative productivity had remained at 1994 levels, the equilibrium

<sup>5</sup> See Appendix II for details.

REER would be now 15 percent higher than the current estimated value. Fiscal consolidation and the increase in openness have depreciated the equilibrium real effective exchange rate by 3 percent and 2.5 percent respectively. The 1997 devaluation created a real undervaluation, but the subsequent appreciation raised the REER back above its equilibrium value during 2000-2001. From 2002-2004 the REER is broadly in equilibrium, and it seems that by the end of 2005 the REER is slightly undervalued (Figure 4).

### Structural competitiveness

16. **Survey based indicators reveal structural impediments to external competitiveness.** Macedonia's low rankings in the World Bank Business Environment database show difficulties in starting and closing a business, enforcing contracts, and hiring and firing workers relative to other countries in the region. In addition, the evolution of the ranking indicates that the structural reforms undertaken have still to improve competitiveness in a meaningful way. According to the World Economic Forum, Macedonia is among the less competitive countries in the region.

Selected Countries Rankings in the Business Environment Database (2005)

	Bulgaria	Romania	<b>Macedonia</b>	Bosnia	Albania	Croatia	Serbia
<b>Overall (doing business)</b>	<b>62</b>	<b>78</b>	<b>81</b>	<b>87</b>	<b>117</b>	<b>118</b>	<b>92</b>
Starting a Business	80	8	<b>114</b>	123	108	103	35
Dealing with Licenses	118	86	<b>64</b>	141	131	148	130
Hiring and Firing	90	149	<b>123</b>	95	127	109	61
Registering Property	62	114	<b>73</b>	132	66	99	103
Getting Credit	46	74	<b>53</b>	9	41	131	99
Protecting Investors	54	44	<b>30</b>	77	136	135	45
Paying Taxes	78	116	<b>58</b>	46	132	85	74
Trading Across Borders	45	72	<b>96</b>	122	100	109	123
Enforcing Contracts	79	65	<b>111</b>	72	113	43	110
Closing a Business	56	102	<b>109</b>	58	73	66	90

Source: World Bank.

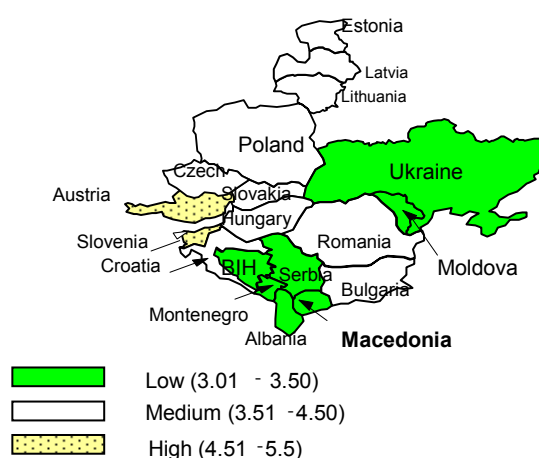


Global Competitiveness Index

	Ranking in 2005	Ranking in 2003
Bulgaria	58	64
Croatia	62	53
Romania	67	75
Serbia	80	77
<b>Macedonia</b>	<b>85</b>	<b>81</b>
Bosnia	95	n.a.
Albania	100	n.a.

Source: WEF.

Growth Competitive Index

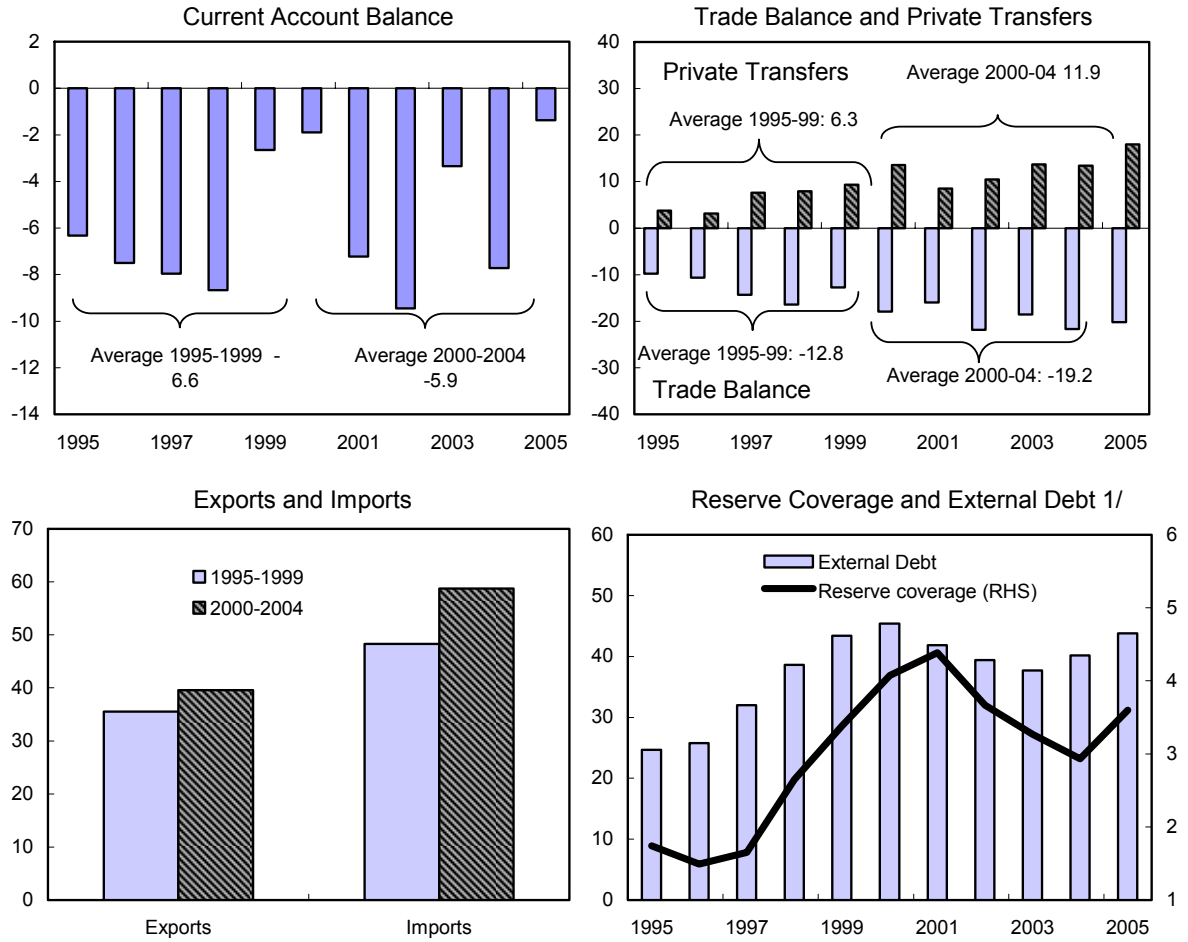


## E. Conclusions and Policy Implications

17. **The analysis in this paper suggests that price competitiveness is broadly appropriate at present, but structural factors are major impediments to future improvements.** The real exchange rate has depreciated steadily and, compared to countries with similar incomes, the Macedonian price level is low. Although estimating the equilibrium real exchange rate is challenging, particularly for transition economies because of data constraints, staff estimates indicate that currently the exchange rate is broadly in line with macroeconomic fundamentals. In contrast, direct wage comparisons across countries suggest a cost competitiveness problem, though data heterogeneity makes comparisons difficult. Macedonian manufacturers have succeeded in maintaining or increasing their share in exports. However, specialization in sectors with low value added and a declining share in total global trade has resulted in a decline in total export share, pointing to a structural competitiveness problem.

18. **While a more competitive exchange rate might improve short-term export performance, sustained improvements require enhanced productivity and resource reallocation to more dynamic sectors, which depends on reforms to improve the business environment.** Contrary to the experience in most transition economies, productivity in Macedonia has declined in the last decade vis-à-vis trading partners, although this trend has started to reverse, improving competitiveness. To sustain and increase market shares, specialization in sectors with higher value added and increasing world demand will be necessary. FDI and domestic private investment are key to achieving the necessary economic transformation, but boosting investment will depend on the successful implementation of structural reforms aimed at improving the business environment (discussed more fully in Chapter II of these Selected Issues).

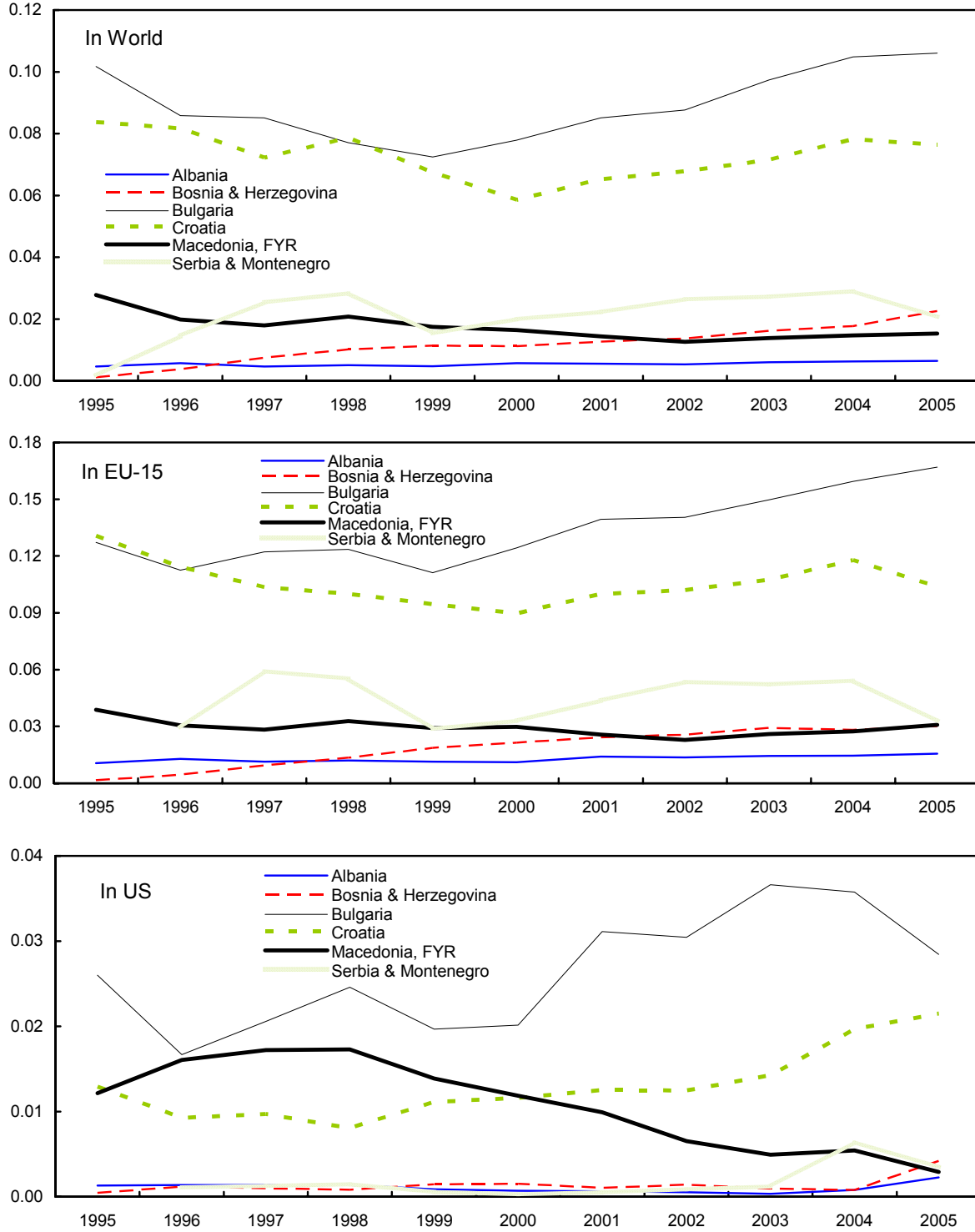
Figure 1. Current Account and External Vulnerabilities  
(As share of GDP)



Sources: NBRM; and IMF staff estimates.

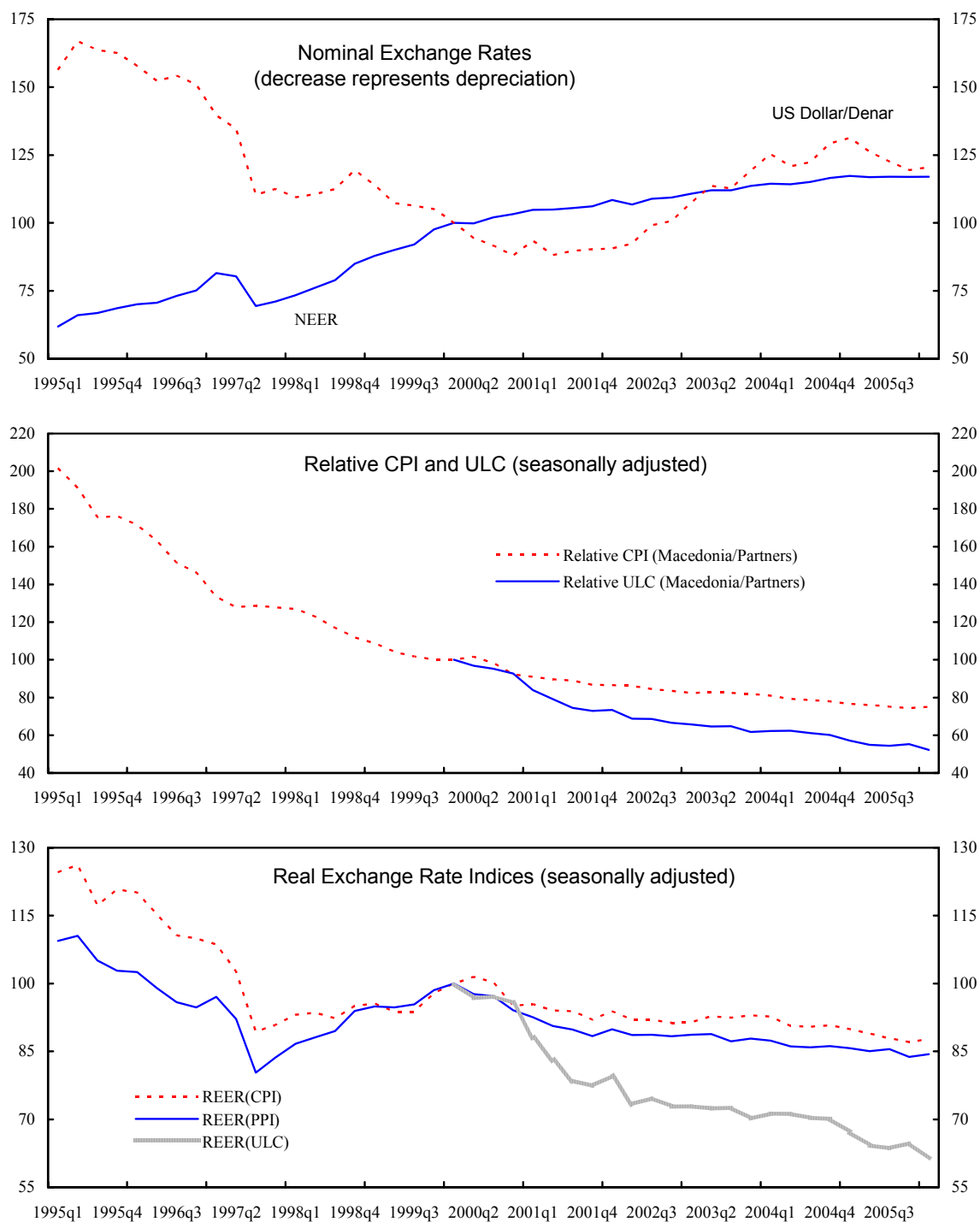
1/ External Debt as percent of GDP. Reserve coverage in Months of Imports of Goods and Services. Data for 2005 excludes the effects of the Eurobond issuance.

Figure 2. Export Market Shares (in percent)



Source: Direction of Trade Statistics.

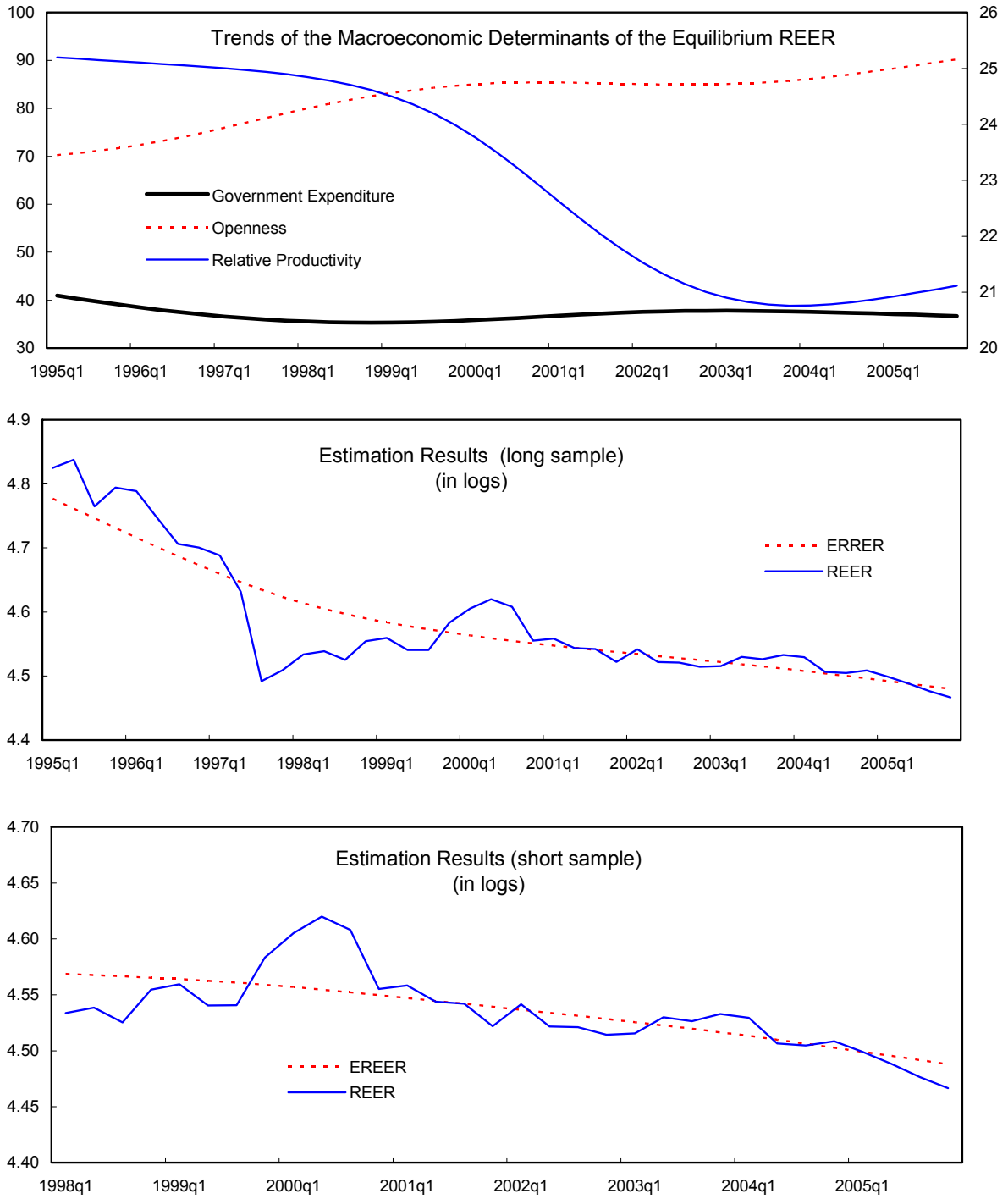
Figure 3. Exchange Rate Indicators, 1995-2006  
(2000q1=100) 1/



Sources: Eurostat; IFS; and IMF staff calculations.

1/ Trade weights based on 1999-2001 data for exports and imports of goods. Partner countries comprise: Austria, Bulgaria, Croatia, France, Germany, Greece, Italy, Netherlands, Russia, Serbia and Montenegro, Slovenia, Switzerland, Turkey, United Kingdom, and United States.

Figure 4. Econometric Estimates of the Equilibrium REER



Source: IMF staff estimates.

## **Appendix I—Estimation of the Equilibrium Real Exchange Rate Using the Macroeconomic Balance Approach**

This approach estimates the real effective exchange rate that simultaneously achieves internal and external balance. To this end, the fundamental equilibrium exchange rate is defined as the exchange rate that will equate the current account to the structural savings/investment balance in the medium term. The estimation process involves three main steps: (i) estimating the *underlying current account*, which is the actual current account adjusted for existing output gaps (both domestic and foreign) and for lagged effects of past real exchange rate movements; (ii) estimating the medium-term domestic savings and investment relation based on economic fundamentals (the *structural current account*), and (iii) calculating the exchange rate that would bring the underlying current account to the level of the structural current account.

### **The Underlying Current Account**

We estimated the underlying current account using the methodology and equations estimated by Isard et al. (2001) for the volumes of non-oil exports and imports:

$$\begin{aligned}\Delta Q_X &= 1.9\Delta A^f - 0.71*[0.3\Delta R + 0.35\Delta R_{-1} + 0.15\Delta R_{-2} + 0.1\Delta R_{-3} + 0.05\Delta R_{-4} + .005\Delta R_{-5}] \\ \Delta Q_M &= 2.1\Delta A - 0.92*[0.3\Delta R + 0.35\Delta R_{-1} + 0.15\Delta R_{-2} + 0.1\Delta R_{-3} + 0.05\Delta R_{-4} + .005\Delta R_{-5}]\end{aligned}$$

Where  $Q_X$  and  $Q_M$  denote the logarithms of export and import volumes,  $A$  and  $A^f$  denote the logarithms of domestic and foreign real absorption (a trade weighted average),  $R$  is the logarithm of the real effective exchange rate, and the  $\Delta$  terms represent annual changes.

Using the equations above we estimate that the Macedonian underlying current account ranges between 0 percent and -3.1 percent, depending on the treatment of private transfers as current account or capital account transactions.<sup>6</sup> The exchange rate is assumed to remain at prevailing levels. WEO projections were used for the 6 year ahead values of real absorption for Macedonia and its trading partners.

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<sup>6</sup> The assumption is that in 2005 (when the cash exchange component of the recorded private transfers grew dramatically) the part representing transfers from migrants grew in line with remittances: the remainder is assumed to be capital account.

## The Structural Current Account

To estimate the structural current account we used the equation of Chinn and Hito (2005) for a panel of developing countries, excluding Africa. The average current account balance (over a 5 year period) is related to the government balance, the country's net foreign asset position, relative per capita income, demographics variables affecting the savings rate (relative to the mean across all countries), the degree of financial development (measured as credit to the private sector), volatility of the terms of trade, average GDP growth, the degree of openness (measured as gross external trade as a share of GDP), a dummy indicating whether the country is an oil exporter or not, and time dummies.

Estimation of the Structural Current Account

Macroeconomic Determinants	Coefficients	Standard Errors
Government budget balance (share of GDP)	0.22	[0.08]***
NFA as share of GDP	0.06	[0.08]***
Relative income	-0.01	[0.07]
Relative income squared	0.01	[0.11]
Relative dependency ratio (young)	-0.03	[0.014]**
Relative dependency ratio (old)	-0.01	[0.012]
Financial deepening	-0.01	[0.007]
Terms of Trade volatility	-0.03	[0.03]
Average GDP growth	0.33	[0.23]
Trade openness	0.01	[0.01]
Dummy for Oil exporting countries	0.03	[0.01]***
Dummy 1980	0.01	[0.01]
Dummy 1985	0.00	[0.01]
Dummy 1990	0.03	[0.01]***
Dummy 1995	0.01	[0.01]
Dummy 2000	0.03	[0.01]***
Dummy 2003	0.05	[0.01]***
Constant	-0.03	[0.02]*

Source: Chinn and Hito (2005).

\* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%

Substituting the values for FYR Macedonia into this equation, we estimate that the structural current account balance is about -2 percent of GDP.<sup>7</sup> The values for Macedonia were obtained from different sources. The government balance was calculated by staff adjusting for central bank recapitalization expenditures. The net foreign asset position was obtained from Lane and Milesi-Ferreti (2006). The rest of the variables were obtained from WEO, IFS, and the World Bank Population Statistics. The constant plus the time dummy for 2003 indicates that the structural current account balance for a developing country should be around 2 percent of GDP excluding the effect of macroeconomic determinants. For the case of Macedonia, the relatively large share of young and old population, and the net foreign asset position are the main factors explaining the estimated 2 percent structural current account deficit.

### **The Fundamental Equilibrium Exchange Rate**

Given the elasticities to exchange rate movements in the equations for the volumes of exports and imports, to bring the underlying current account in line with the structural current account the real exchange rate would have to depreciate at most by 4 percent. Since this is within a +/- 10 percent range of the fundamental equilibrium exchange rate, the current real exchange rate is considered to be broadly in equilibrium.

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<sup>7</sup> Similar results were obtained with an unpublished equation estimated by staff at the IMF Research Department.



## Appendix II—Econometric Estimation of Structural Determinants of the Real Exchange Rate

Typically, empirical studies estimate the “equilibrium” values of different exchange rates by identifying their structural determinants using an exchange rate model. The framework adopted in this paper is similar to that proposed by MacDonald and Clark (1999). The starting point is the real interest rate parity condition, where the change in the real exchange rate ( $q$ ) is equal to the real interest rate ( $r$ ) differential plus a risk premium ( $\rho$ ). This parity condition can be expressed as:

$$q_t = q_{t+k}^e + (r_t - r_t^*) + \rho_t.$$

The future expected real exchange rate can be interpreted as the long-run component of the real exchange rate, which encompasses the effect of the main underlying variables:

- A country with a relatively high net foreign assets to GDP ratio (NFA) has higher wealth, higher price of nontradables and thus a more appreciated domestic currency. In addition, higher NFA means that a country can sustain a worsening current account resulting from a loss in competitiveness of an overvalued real exchange rate (Lane and Milesi-Ferretti, 2000). Both effects imply that higher NFA is related to a more appreciated domestic currency.
- The relative price of traded to non-traded goods encompasses various effects on the real exchange rate. First, less developed economies tend to experience productivity improvements in the tradable sector as they converge toward more advanced economies (Balassa-Samuelson effect). As productivity increases, wages and prices of nontradable goods will tend to increase relative to those of trading partners; thus, the domestic currency will tend to appreciate in real terms. Second, a more open trade regime (i.e., less trade restrictions) will tend to lower the domestic price of tradable goods, and will lead to a real depreciation of the domestic currency. Third, a deterioration in the fiscal stance, resulting from an increase in government expenditure, will tend to raise the relative price of nontradables (i.e. an appreciation of the real exchange rate), as a large share of government expenditure is on nontradables.
- An improvement in the terms of trade tends to increase the country’s wealth, its domestic demand, and nontradable prices, with a real appreciation of the domestic currency (wealth effect). On the other hand, higher nontradable prices may shift domestic demand toward imported goods (substitution effect), which tends to offset the wealth effect. As pointed out by MacDonald and Ricci (2003), empirical studies

have failed to establish a robust link between the terms of trade and the real exchange rate, probably because of the noise introduced in the measurement of country-specific import and export deflators. On the other hand, recent studies (see for example, Cashin, Céspedes and Sahay, 2002) have found a strong relation between the real exchange rate and the price of commodity exports, perhaps because of the more accurate measurement of commodity prices.

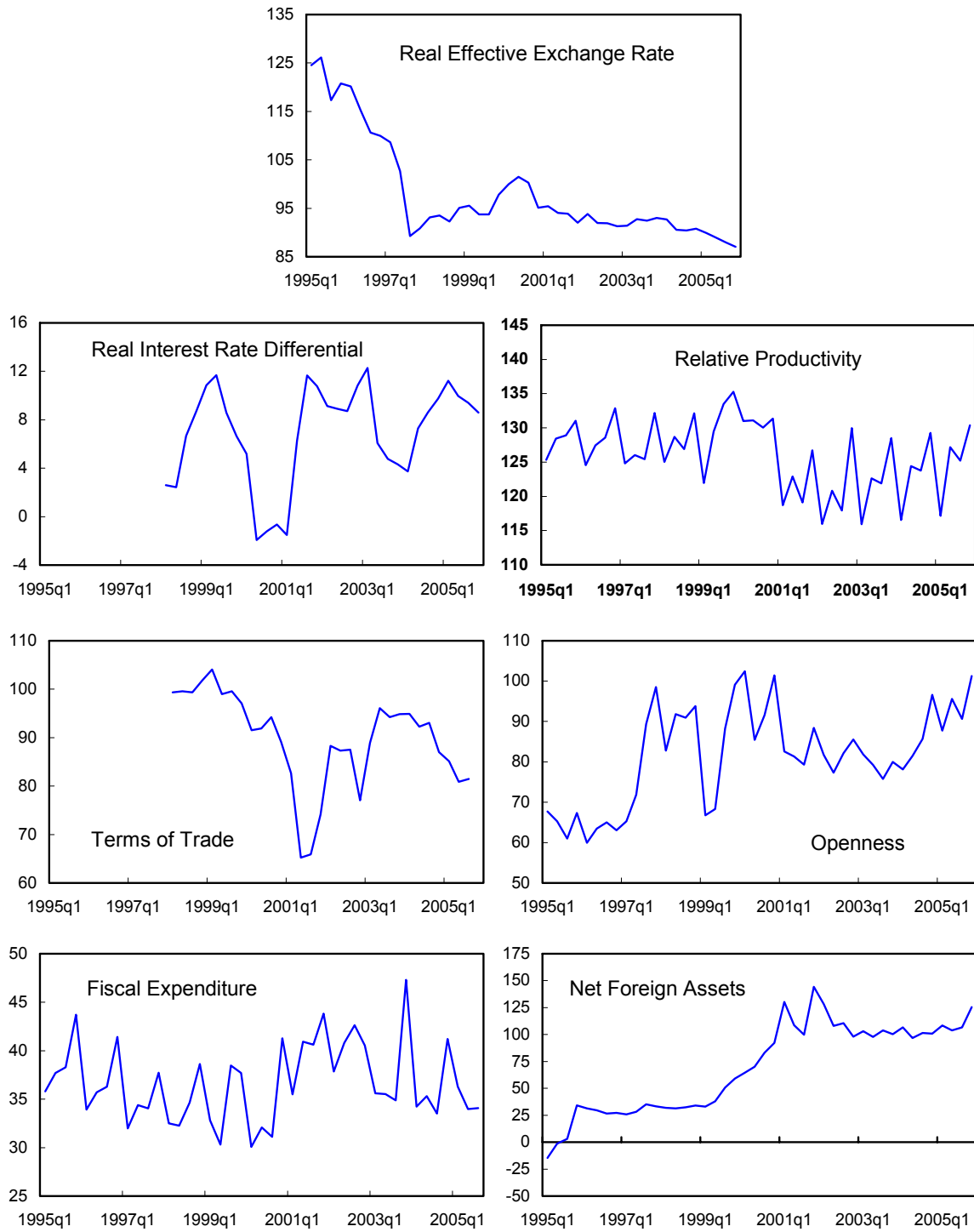
As suggested by MacDonald and Ricci (2003), real interest rate differentials capture three different effects—aggregate demand changes, productivity changes, and persistently tight monetary policy—leading to domestic currency appreciation. First, higher interest rates relative to other countries are associated with an increase in absorption, higher nontradable prices, and a real appreciation. Second, an increased productivity of capital would result in capital inflows and an appreciation of the domestic currency. Third, a tight monetary policy, in the presence of price rigidities, would lead to a domestic currency appreciation. There is no hard rule on whether to include the interest rate differential as part of the long-run component or, instead, as part of the short-run exchange rate dynamics. Both effects could be present.

### **Data description**

Figure 1 shows the real effective exchange rate index for the period 1995:Q1-2005:Q4 and its long-run determinants.

Overall, the real exchange rate has depreciated over the period. From 1995-1997 there was a significant real depreciation culminating with the 1997 devaluation. Subsequently, the REER appreciates mostly due to the depreciation of the Serbian denar. Moderate inflation compared to trade partners explains the depreciation trend since end-2000. Over the same period, Macedonian real GDP per capita has declined relative to the main trading partners, a trend that started to reverse in the last 3 years due to increased GDP growth. The NFA of the domestic banking system has continuously increased as a share of GDP and the economy has become more open. The terms of trade has been quite volatile, as well as the real interest rate differential vis-a vis the EU. Unfortunately, these variables are only available since 1998. Due to this limitation and to abstract from the possible break introduced by the 1997 devaluation, the analysis was conducted for the full period, as well as for the period from 1998-2005.

Figure 5. Real Effective Exchange Rate and its Long-run Determinants, 1995-2005



Sources: MBRD; and IMF staff estimates.

## Estimation

We used a vector error correction framework (VECM), employing the maximum likelihood estimator of Johansen to estimate a long-run (cointegration) relationship between the exchange rate and macroeconomic fundamentals. An important advantage over single-equation methods (such as the Engle-Granger method) is that it accounts for simultaneity and autocorrelation of the endogenous variables. The VECM also permits the inclusion of additional exogenous variables that may help explaining the short-run behavior of the real exchange rate.

$$\Delta Z_t = \delta + \Gamma Z_{t-1} + \sum_{i=1}^{p-1} \rho_i \Delta Z_{t-i} + \sum_{i=0}^n \gamma_i \Delta X_{t-i} + \varepsilon_t$$

The vector  $Z$  includes the real effective exchange rate as well as its macroeconomic determinants, while the vector  $X$  includes the exogenous variables.  $\Gamma$  is a  $(n \times n)$  matrix of coefficients whose rank determines the number of cointegrating vectors. If  $\Gamma$  is of reduced rank  $r$  (with  $r < n$ ), then  $\Gamma$  can be expressed as  $\Gamma = \alpha\beta'$  where  $\beta$  is the matrix with  $r$  linearly independent cointegrating vectors, and  $\alpha$  is a matrix with the speed of adjustment coefficients to the long-run equilibrium. The coefficients  $\rho$  and  $\gamma$  capture the short-run elasticities of the endogenous and exogenous variables, respectively.

The implementation of the VECM framework requires the series to be cointegrated. Therefore, our limited sample size warrants some caution in the interpretation of the econometric results. Prior to the cointegration analysis, the Augmented Dickey-Fuller test was applied to each time series, in each case failing to reject the null hypothesis of a unit-root, independent of the period considered (although marginally so in the case of the real interest rate differential). To analyze cointegration, the Johansen maximum likelihood method is applied to the set of endogenous variables,  $Z$ . The trace test and the maximum-eigenvalue test always found evidence of at least one cointegration relationship.

Different VEC specifications were estimated. We found that the TOT and the NFA were not significant determinants of the REER, and given the short data sample, we eliminated the variables to avoid losing degrees of freedom. The following table includes the estimation results of the preferred specification for the different samples.

	1995q3-2005q4	1998q3-2005q4
<b>Cointegrating Vector</b>		
FISC(-1)	0.02 [-5.3]	0.01 [-4.6]
RGDPPC(-1)	2.74 [-9.3]	1.98 [-7.6]
OPEN(-1)	-0.01 [ 8.4]	0.00 [ 5.7]
C	3.68	4.02
<b>Error Correction:</b>		
$\alpha$	-0.29 [-2.4]	-0.41 [-2.4]
<b>Short-run Dynamics</b>		
D(REER(-1))	0.13 [ 0.9]	0.19 [ 1.0]
D(REER(-2))		0.02 [ 0.1]
D(FISC(-1))	0.00 [-0.7]	0.00 [-1.1]
D(FISC(-2))		0.00 [-1.5]
D(LRRGDPPC(-1))	-0.10 [-0.3]	-0.53 [-1.3]
D(RRGDPPC(-2))		-0.45 [-1.5]
D(OPEN(-1))	0.00 [ 0.3]	0.00 [ 2.0]
D(OPEN(-2))		0.00 [ 2.8]
<b>Exogenous variables</b>		
RIRR_EU		0.00 [-0.4]

T-Statistics in brackets.