PRELIMINARY VERSION

Equilibrium Exchange Rates: Are They Suited for Policy Purposes?

An Application to CEE Acceding Countries[1]

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This version: October 1, 2003

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[1] The opinions expressed in the paper are those of the authors and do not necessarily correspond to the official view of the Oesterreichische Nationalbank.

We would like to thank Jakub Borowski and Anna Czogala for providing us with the regulated price series for Poland.

I. Introduction

In view of the approaching enlargement of the European Union, equilibrium exchange rates of CEE acceding countries have drawn increasing attention. As the new member states are obliged to adopt the euro at some point in the future, it appears crucial to examine what exchange rate might be best suited for entry to ERM-II and for the irrevocable conversion rate. On one hand, euro adoption is preceded by entry to ERM-II, and this requires a cautiously chosen parity. In accordance with the Maastricht Treaty, the successful candidate for adopting the euro has to have low inflation and a stable exchange rate in an environment of unrestricted capital flows for at least two years. An inappropriate exchange rate parity could make it impossible to attain low inflation. At the same time, financial markets are bound to test the chosen parity in the event euro-candidate countries are perceived as being inconsistent in their macroeconomic policies. On the other hand, fixing the exchange rate at a misaligned level with which the countries are to adopt the euro would most probably require adjustment mechanisms that harm growth and thus real convergence. The irrevocable conversion rate should therefore trigger neither inflation because of too large undervaluation, nor an immediate loss of competitiveness due to overvaluation.

However, the interest in equilibrium exchange rates of CEE acceding countries stems not only from the need to fix the currency within the ERM-II and later towards the euro. It is also due to the observation that for a number of years now, the real exchange rate has been on a trend-appreciation path. A frequently used explanation for this trend appreciation is the Balassa-Samuelson effect, i.e. a productivity-fuelled increase in service prices (Balassa 1964, Samuelson 1964). Nonetheless, recent research could not establish that the increase in service prices is the principal reason for the trend appreciation (Égert 2002, Égert et al. 2003). One reason for this is the low share of market services in the CPI of CEE acceding countries. Another possible explanation is that due to increases in industrial goods prices, the PPI-deflated real exchange rates have also exhibited a trend appreciation. Indeed, the PPI-based real exchange rate has in some countries appreciated nearly as much as the CPI-deflated real exchange rate. In most models of an open economy, such appreciation implies deterioration of competitiveness, which cannot be sustained. But, albeit current account deficits are large in acceding countries, at times improvements in the trade balance and the current account could be observed despite the appreciation of the CPI and PPI-based real exchange rates. This indicates that at least part of this appreciation may be an equilibrium phenomenon.

So far, in models and estimations of equilibrium real exchange rates for the acceding countries, the issue of a trend increase in both the CPI and PPI deflated real exchange rate has rarely been

addressed. The model generally considered as the most suited for CEE acceding countries is the Balassa-Samuelson model aimed at explaining persistent deviations from PPP both in levels and in dynamics by the development of service prices. In addition, models referring to the underlying or macroeconomic balance are employed; however, also in such a procedure the real appreciation is derived mainly from the Balassa-Samuelson effect.

Numerous estimations of the real exchange rate and the equilibrium real exchange rate have already been made for the accession countries[2], with an array of results and therefore leaving some confusion about which result could indeed indicate what exchange rate the countries should choose as a best guess for fixing in the ERM-2 and monetary union.

In this context, the goal of this paper is twofold. On one hand, approaches are used as a theoretical background that incorporate the equilibrium appreciation of the PPI-deflated real exchange rate. On the other hand, these approaches are tested econometrically for the Czech Republic, Hungary, Poland, Slovakia and Slovenia. Indeed, an attempt is made to lay the econometric estimation on a basis as large as possible. In doing so, a number of time series and panel cointegration methods are employed, which leaves us with a number of estimates. This enables us to draw conclusions about the uncertainty surrounding estimates of equilibrium exchange rates and the size of misalignment.

The remainder of the paper is structured as follows. Section II provides an overview on developments of the real exchange rates. Section III presents the theoretical framework. Subsequently, Section IV shows the dataset and Section V describes the econometric techniques employed. Section VI then interprets the estimation results followed by the presentation of the derived real misalignment in Section VII. Finally, Section VIII draws some concluding remarks.

II. Real Exchange Rates in Acceding Countries

The real exchange rate of the CEE acceding countries has been on a appreciating path from the outset of transition. Although also true when measured in effective terms, this especially holds true when the German mark and the euro is taken as a benchmark. The evolution of both the CPI and PPI-deflated real exchange rate in the five countries under study are depicted in Figure 1 and some descriptive statistics are provided in Table 1 hereafter.[3]

[2] For a recent survey, see Égert (2003).
[3] The exchange rate is expressed as units of the domestic currency over one unit of foreign currency. Hence, a decrease/increase in the exchange rates corresponds to an appreciation/depreciation of the currency.

Table 1 The CPI and PPI-based real exchange rate vis-à-vis the German mark/Euro, 1993-2002

		RER-CPI	RER-PPI
Czech Republic	1993-2002	-42.4	-32.4
	1995-2002	-36.8	-29.0
Hungary	1993-2002	-26.9	-15.7
	1995-2002	-32.3	-24.7
Poland	1993-2002	-37.4	-26.1
	1995-2002	-34.0	-23.8
Slovak Republic	1993-2002	-34.2	-24.3
	1995-2002	-29.6	-20.8
Slovenia	1993-2002	-18.2	-9.7
	1995-2002	-11.1	-3.5

Source: Authors' own calculations
Note: Negative/positive figures denote an appreciation/depreciation of the real exchange rate

Figure 1 The CPI and PPI-based real exchange rate vis-à-vis the German mark/Euro, 1993-2002

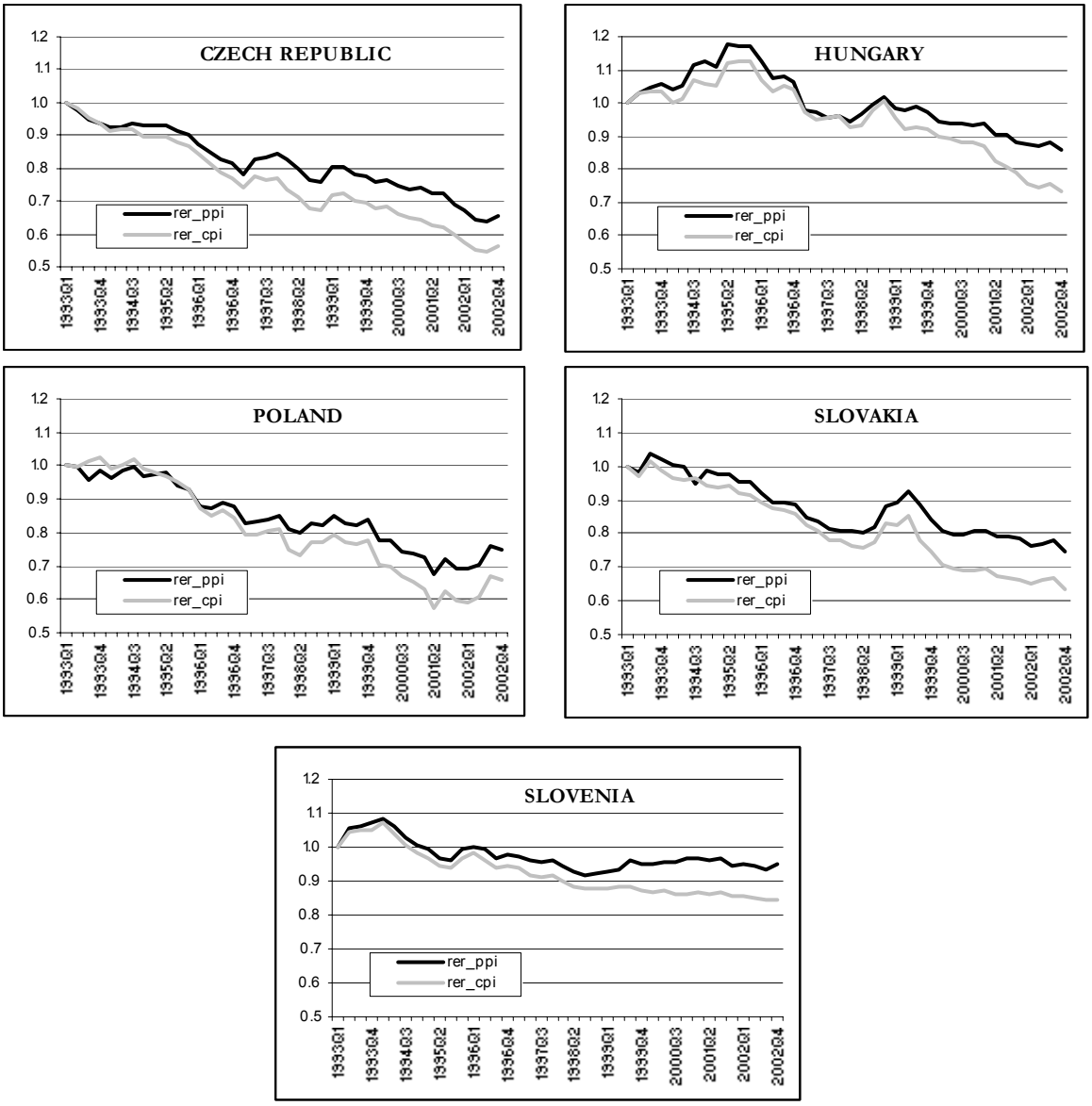


Figure 1 and Table 1 reveal a significant appreciation of the CPI-based real exchange rate with the exception perhaps of Slovenia. A popular explanation for this phenomenon is the well-known

Balassa-Samuelson effect. In the event that productivity gains in the open sector exceed those witnessed in the closed sector, service prices in the latter will increase faster provided wages tend to equalise across sectors. This, all things being equal, results in higher overall inflation. Going one step further, if the rate of growth in the productivity differential is higher in the home country compared with that in the foreign country, the CPI-deflated real exchange rate will appreciate because of the positive inflation differential triggered by productivity-led service price inflation.

However, as also plotted in Figure 1 the PPI-based real exchange rate vis-à-vis the German mark/Euro has appreciated nearly as much as the CPI-deflated real exchange rate over the period from 1993 to 2002. It turns out that in all countries except for Slovenia the appreciation of the PPI-based real exchange rate amounted to roughly 70% of the CPI-based real appreciation. This indicates that industrial goods prices have also increased in the acceding countries more than in the reference country. Therefore, only part of the real appreciation is related to increases in service prices such as suggested by the BS effect[4]. In other words, only the difference between the CPI and PPI-deflated real exchange rate is to be explained by the BS effect.

However, numerous service items are still regulated or fall into administered prices. Their share in the CPI basket of the acceding countries can be as high as 25 % (Poland 2002). And, more importantly, in some of the countries, increases in regulated service prices have systematically exceeded those of market services over the period under study. Further to this, the difference in regulated/administered prices has been positive relative to the reference country, i.e. Germany where regulated prices also represent some 20% of CPI. Hence, even the difference between the CPI and PPI-based real exchange rates might be not fully explained by productivity increases spilling over into higher market service prices.

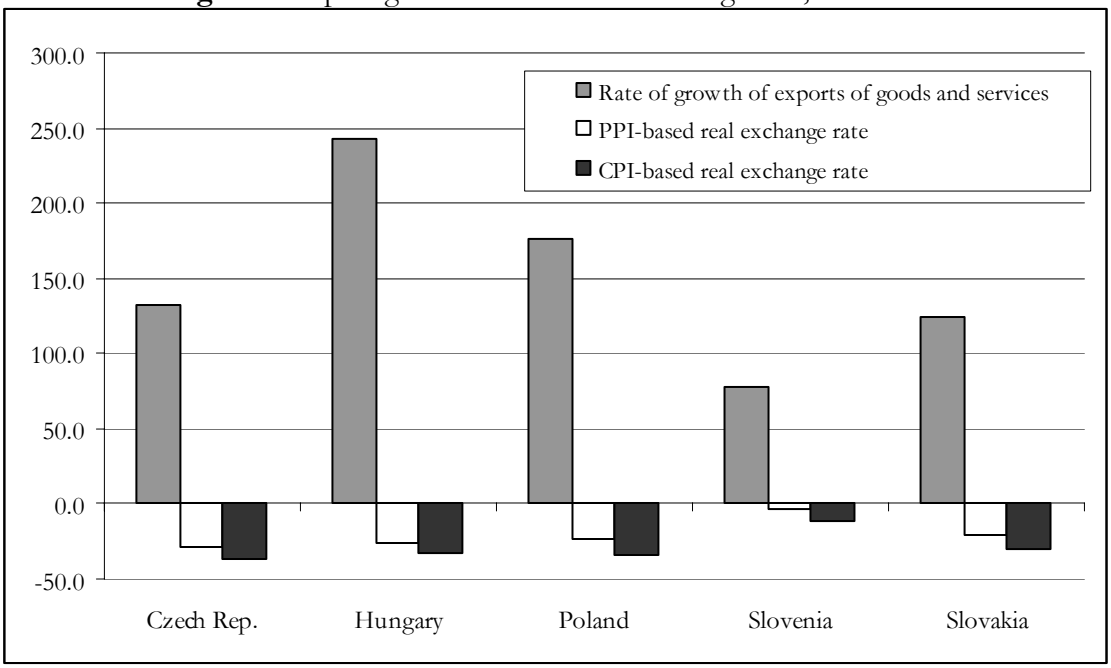
So, the sizeable appreciation of the PPI-based real exchange rate in nearly all countries remains to be explained. A first explanation would be to say that part of the PPI-based real appreciation may reflect a correction of the sizeable devaluation of the currencies at the very beginning of the transition process. Uncertainties surrounding demand for foreign currency coupled with fast trade liberalisation led policy makers to prefer too large a devaluation to one that would immediately threaten the external balance (Rosati 1996). But this explanation might, however, appear insufficient because real appreciation in PPI terms proved to be a rather steady process over the last 14 years or so, especially in the cases of the Czech Republic and Poland.

[4] Although market service prices appear to grow in line with productivity gains in industry (e.g. Égert et al. (2003)), their low share in CPI considerably dampens their impact on overall inflation.

Nonetheless, if a huge initial devaluation was necessary because domestic supply lacked competitiveness in domestic and foreign markets, real appreciation may occur if domestic supply capacities and product quality increase as was the case of a number of transition economies.

According to standard macroeconomic models, an increase in the relative price of the domestic good should yield a loss in competitiveness and entail a worsening of the trade balance and thus the current account. Although most of the countries have been running large current account deficits, there have been episodes of improvements in the trade balance and the current account in spite of the real appreciation. Exports have indeed experienced tremendous growth and have grown nearly as much as imports. As shown in Figure 2 below, all countries have witnessed, over the period from 1995 to 2002, a strong increase in export revenues expressed in German mark at current prices. More specifically, Hungary and Poland can sport the highest increases, whereas export growth proved the slowest in Slovenia despite the very moderate appreciation of the real exchange rate. [5]

Figure 2 Export growth and the real exchange rate, 1995-2002



Export performance of acceding countries appears to be closely related to privatisation strategies and to attitudes towards foreign direct investment inflows. Foreign direct investment has had beneficial effects on export performance and economic growth.[6] FDI helped economic restructuring by means of financing fixed capital investment and implementing state-of-the-art technology and Western-style organisational structures and schemes. But most importantly, FDI often aimed at export sectors and hence created export capacities. Foreign involvement made

[5] Growth in export revenue is also pronounced in 1993 and 1994. However, real appreciation is less marked.

access to foreign market easier. However, because countries adopted different strategies towards privatisation and capital inflows, the extent to which they benefited from FDI differs largely. Whereas privatisation in Hungary relied heavily on sales to foreign investors, in the Czech Republic, foreign capital started to pour in on a wider scale only after reforms accelerated in 1997. Political instability in Slovakia prevented direct investments from flowing in till 1998 and Slovenia has been hesitating to open up its economy to foreign investments until quite recently. It turns out that export revenues have grown most in countries with large foreign investments. Figure 2 suggests that growing export revenues have been accompanied with higher real appreciation.

One possible explanation for this is that FDI gave rise to very rapid changes in the composition of GDP and especially in that of manufactured goods. A marked shift occurred from predominantly low quality, low value added, and labour and raw material intensive goods towards products of increasingly higher quality and higher value-added that triggered increased foreign demand for these products. Simultaneously, not only the quality of exported goods, but also an economy-wide quality improvement of all goods and services took place, although somewhat more slowly. This may have improved the reputation of domestic products.

At the outset of transition, these economies were characterised by a strong bias towards imported foreign goods. However, improving quality and marketing of domestically manufactured goods and an improved ability and capacity of the countries to produce goods of the more preferred foreign brands, the bias towards imported goods may become weaker. Changes in non-price competitiveness of domestic products and improving supply capacities could indeed reverse the strong initial devaluation and lead to a steady appreciation of the real exchange rate measured in PPI and CPI terms.

Price increases leading to real appreciation based on this mechanism may have two sources. On one hand, if quality changes are not appropriately dealt with, they are passed through onto prices. On the other hand, goods of better reputation can be priced differently, which is impossible to correct for when calculating inflation.

Hence, the basic proposition we would like to test in the remainder of the paper is that part of the PPI-based real appreciation is an equilibrium phenomenon that can be linked to the aforesaid factors.

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[6] See e.g. Darvas and Sass (2001), Sgard (2001), Campos and Coricelli (2002) and Benacek et al. (2003)

III. Theoretical Framework

III.1. Macroeconomic Balance and NATREX

Models that stipulate PPP to hold are not appropriate to track down the real appreciation of the tradables price-deflated real exchange rate, i.e. a sustainable positive differential in home and foreign tradable prices. The BS model is also discredited as being able to fully explain the real exchange rate given that it assumes tradable prices to be determined exogenously in international markets.

However, models in which the real exchange rate is viewed in equilibrium only if both external and internal balances are reached can allow for a long-term change in tradable price-deflated real exchange rate. Montiel (1999) defines external balance in terms of the current account such that any imbalances in the current account be financed by sustainable capital flows. On the other hand, internal balance refers to cleared domestic markets defined in terms of labour market or market for domestic non-tradable goods. In such a setting, lasting changes in the relative price of even tradable goods are possible in the event this is consistent with internal and external balances. The underlying assumption here is the imperfect substitutability of tradable goods.

The NATREX model developed by Stein (1994,1995,2002) can also account for changes in the real exchange rate that is based on the overall price level of the economy, i.e. including tradable goods. The model distinguishes between medium- and long-term equilibrium exchange rate. The medium-term NATREX is determined by the external macroeconomic balance condition relating the current account to the capital account[7]:

$$NX - r^{*} FDEBT = S - I \qquad (1)$$

where NX, r* and FDEBT stand for net exports (trade balance), the foreign interest rate and foreign debt. S and I denote savings and investment and all variables except for interest and exchange rates are expressed as fractions of the GDP.

Net exports (NX), i.e. the trade balance, and net income payments for the foreign debt (or assets) (r*FDEBT) have to equal capital flows determined by saving-investment (S-I) decisions. Trade balance depends on the real exchange rate with a depreciation improving net exports, and the level of GDP that determines the imports. Investment is determined by the Tobin's q-ratio that relates the productivity of capital to its replacement costs. Savings are measured as social savings, i.e. private and public savings, and equal GDP minus income payments to foreigners and consumption. Private consumption depends on the stock of physical capital, which produces

[7] Capital flows do not include speculative flows; the natrex abstracts from short-term movements.

income flows according to capital productivity (+), on foreign debt (-) and time preferences, i.e. propensity to saving. An increase in debt reduces wealth, i.e. the capital stock plus foreign assets, and increases savings. Hence savings minus investment depend on capital productivity, which determines investment and wealth at the same time, and "thrift" standing for the saving ratio.

The real exchange rate is at its medium-term equilibrium if net exports plus net income payments equal capital flows determined by investment and savings decisions. Although equation (1) requires real interest rates to equalise across the domestic and foreign economies, current account deficits can occur. To ensure that foreign debt stabilises, i.e. that capital flows leading to the equalised real interest rates will not continue indefinitely, the model considers the evolution of the capital stock and foreign debt (assets) connected with the macroeconomic balance described in Eq. (2):

$$\Delta FDEBT = I - S - g \tag{2}$$

where g represents the rate of growth of GDP and is given in Eq (3):

$$g = b \cdot I \tag{3}$$

with b standing for capital productivity. A change in capital stock and foreign debt can impact on the current account and therefore on the medium-term macroeconomic balance. The medium-term NATREX leads to macroeconomic balance with a given capital stock and foreign debt, but it will change with developments in foreign debt and capital stock. The long-term NATREX eventually prevails in the event capital stock and foreign debt converge to their long-term values.

Two scenarios linked to changes in the underlying fundamentals are often referred to and deserve special attention. The first one consists in an increase in time preferences leading to a decrease in savings. Hence, the current account deteriorates and foreign debt increases. Albeit the real exchange rate will have to appreciate at the beginning to restore medium-term equilibrium, the opposite will happen in the long-term. As foreign debt increases, income payments will grow and require a real depreciation for maintaining equilibrium.

The second scenario is when productivity growth is higher in the home country compared with the rest of the world. Similarly to the previous case, an increase in investments will results in current account deficits, the subsequent real appreciation followed by an increase in foreign debt. In contrast to the case with higher time preference, such appreciation can be sustained if higher GDP and wealth, i.e. the result of investment, can cover higher imports and higher income payments to the foreign country.

III.2. PPI-Based Real Appreciation and Consumer Preferences

An equilibrium appreciation of the real exchange rate can also be shown in a framework entirely focusing on the trade balance and abstracting from capital flows. Let us consider a two-country, two-good framework where the external equilibrium is defined as a balanced trade balance. The supply side of the home and foreign economies are given by the following functions:

$$Y = f(A, t, K, L) \tag{4}$$

$$Y^* = f(A^*, t^*, K^*, L^*) \tag{5}$$

where * denotes the foreign economy and t stands for technology. Technology and capital stock is initially higher in the foreign country compared with those in the domestic one and this implies higher foreign GDP. Each country produces one good and consumes both. Goods are at least imperfect substitutes, so that PPP does not hold. Let us now assume that $t^* > t$ and $\Delta t^* < \Delta t$. Hence, GDP growth is higher in the domestic economy due to technological catch-up.

The demand side of the two economies are described with utility functions in which both goods enter in both economies. The utility of consuming the domestic good is a positive function of technology: The higher the technological content, the higher the utility. Demand for the domestic good therefore depends on technology. With increasing technological content, demand for the domestic good increases both in the domestic and the foreign economy. In addition, it is assumed that in the home country, demand for the foreign good is negatively linked to the technological content of the domestic good but it does not affect the demand for the foreign good in the foreign economy.

The demand functions of the domestic and foreign economies can be described as follows:

$$D = C(\overset{+}{Y}, \overset{+}{t}, \overset{-}{P/P^*}) + C^*(\overset{+}{Y}, \overset{-}{t}, \overset{+}{P/P^*}) \tag{6}$$

$$D^* = C(\overset{+}{Y^*}, \overset{+}{t}, \overset{-}{P/P^*}) + C^*(\overset{+}{Y^*}, \overset{+}{P/P^*}) \tag{7}$$

where D, C, Y, A and P stand for demand, consumption, GDP, technology and prices, respectively. Equilibrium is determined when the current account is balanced. Note that because of the assumption of no capital flows, the current account (CA) equals the trade balance. Hence:

$$CA = 0 \tag{7}$$

$$P \cdot Q = P^* Q^* \tag{8}$$

with Q denoting the quantity of exported goods. Exports of the domestic good are given by the demand for the domestic good in the foreign economy, whilst imports of the foreign good are

determined by domestic demand for the foreign good. The equilibrium condition can be derived by substituting the foreign demand for domestic good (exports) and the domestic demand for foreign good (imports) into Eq. (8):

$$CA = 0 = P/P^* \cdot C(\overset{+}{Y^*}, \overset{+}{t}, \overset{-}{P/P^*}) - C^*(\overset{+}{Y}, \overset{-}{t}, \overset{+}{P/P^*}) \qquad (9)$$

A change of the relative price due to the growth of technology in the domestic economy can be shown from the total differential of this equilibrium condition. Normalising P* to 1 (P denotes the relative price henceforth), the total differential becomes:

$$dCA = P \cdot \left[\frac{\partial C}{\partial Y^*} dY^* + \frac{\partial C}{\partial t} dt + \frac{\partial C}{\partial P} dP \right] - \left[\frac{\partial C^*}{\partial Y} \frac{\partial Y}{\partial t} dt + \frac{\partial C^*}{\partial t} dt + \frac{\partial C^*}{\partial P} dP \right] \quad (10)$$

Setting the rate of growth of foreign GDP to 0, i.e. $dY^* = 0$, and re-arranging terms as in Eq. (11) – (13), the total differential becomes:

$$P \cdot \frac{\partial C}{\partial t} dt - \frac{\partial C^*}{\partial Y} \frac{\partial Y}{\partial t} dt - \frac{\partial C^*}{\partial t} dt = \frac{\partial C^*}{\partial P} dP - P \cdot \frac{\partial C}{\partial P} dP \qquad (11)$$

$$\left[P \cdot \frac{\partial C}{\partial t} - \frac{\partial C^*}{\partial Y} \frac{\partial Y}{\partial t} - \frac{\partial C^*}{\partial t} \right] \cdot dt = \left[\frac{\partial C^*}{\partial P} - P \cdot \frac{\partial C}{\partial P} \right] \cdot dP \qquad (12)$$

$$\frac{dP}{dt} = \frac{P \cdot \frac{\partial C}{\partial t} - \frac{\partial C^*}{\partial Y} \frac{\partial Y}{\partial t} - \frac{\partial C^*}{\partial t}}{\frac{\partial C^*}{\partial P} - P \cdot \frac{\partial C}{\partial P}} \qquad (13)$$

The expression in the denominator is positive because import of the foreign good increases with the real appreciation ($\partial C^*/\partial P \succ 0\,\delta$) and export of the domestic good are a decreasing function of the relative price ($\partial C/\partial P \prec 0\,\delta$). The overall effect of the change in technology on the relative price depends on the expression in the nominator. Export, positively related to technology ($\partial C/\partial t \succ 0$), is multiplied by the relative price. The second term represents imports connected to income and works towards real depreciation if real income increases. The third term is negative ($\partial C^*/\partial t \prec 0$), i.e. higher supply capacities result in declining imports because domestic goods of higher quality are consumed instead. Therefore, the overall effect depends on whether or not the increase in exports and the decrease in imports, a result of the higher technological content of domestic products exceed the increase in imports linked to higher income. Thus, for the overall effect to be positive, increases in imports related to higher income should be lower than the growth of exports and the decline in imports due to technological change:

$$P \cdot \frac{\partial C}{\partial t} - \frac{\partial C^*}{\partial t} > \frac{\partial C^*}{\partial Y} \frac{\partial Y}{\partial t} \tag{14}$$

III.3. Reduced Form Equation

Based on the above developed two models, the reduced form of the real exchange rate can be determined as follows:

$$RER = RER(\overset{-}{PROD}, \overset{-}{REG}, \overset{-}{RIR}, \overset{+}{FDEBT}, \overset{+/-}{OPEN}, \overset{+/-}{TOT}, \overset{+/-}{GOV},) \tag{15}$$

Labour productivity in industry (PROD) is expected to be negatively related to the real exchange rate, i.e. an increase/decrease in productivity should lead to an appreciation/depreciation of the real exchange rate. Labour productivity primarily stands for higher supply capacities that can lead to an appreciation through the channel of changes in preferences in line with increasing technological content of and thus demand for the domestic good in the domestic and foreign economies. The sector that is likely to benefit the most from technological catch-up and produces most of exported goods is industry. However, changes in technology and preferences may not only be limited to domestic tradables, but all goods and services in the economy as a whole. In this case, higher supply capacities will be reflected in higher real GDP *(GDP)* and may therefore be connected positively with the price level. However, labour productivity in industry also captures the traditional BS effect that operates through service prices. But, as mentioned earlier, this effect is rather limited due to the small share of non-tradables in the acceding countries' CPI basket.

Labour productivity is completed with *regulated prices (REG)* which rose the fastest among the components of the CPI over the last 10 years or so. Regulated prices constitute a cost-push factor on one hand, which may erode competitiveness if it raises the price of traded goods. On the other hand, however, only part of the regulated prices affects directly traded goods costs, so a correction of the exchange rate may not be needed for maintaining external balance. Furthermore, a rise in regulated prices lowers disposable income. In sum, an increase/decline in regulated prices is expected to bring about an appreciation/depreciation of the real exchange rate.

The real interest rate differential (RIR) reflects indeed imbalances between investment and savings and is expected to be negatively connected to the real exchange rate implying that an increase leads to the real appreciation of the currency.

Foreign debt as percentage of GDP (FDEBT) should lead to a depreciation of the real exchange rate due to the higher interest payments to the rest of the world.

Openness (OPEN) can stand for higher exports resulting from increasing supply capacities and is this negatively connected with the real exchange rate. However, *openness (OPEN)* is traditionally viewed as an indicator of trade liberalisation. Increasing openness indicates a higher degree of trade liberalisation. Because it comes through the abolishment of trade barriers and thus allowing foreign products to enter more freely the country, an increase in openness is to worsen the trade balance. Hence, a rise in openness is expected to yield a depreciation of the real exchange rate. The expected sign is therefore ambiguous.

Terms of trade (TOT), determined as export prices over import prices, do not have an obvious sign. If exports and imports have low price elasticities such as primary or very differentiated goods, an increase in the terms of trade would imply an increase in export revenues and hence an amelioration of the trade balance, which could result in an appreciation of the nominal and thus the real exchange rate. But also, increasing export revenues would lead to higher income and because higher income could imply more consumption falling on non-tradables, a demand-side driven increase in the relative price of non-tradables is also likely to make the real exchange rate to appreciate. By contrast, in the event that exports are price sensitive, an increase in terms of trade would not necessarily yield an improved trade balance. As a result, a combination of price elasticities of domestic supply and foreign demand might or might not lead to an increase in trade when export prices increase. So, whether an increase in the terms of trade will bring about real appreciation or depreciation remains uncertain.

Likewise, the expected sign of *government debt over GDP (GOV)* is not clear-cut. If an increase in the public debt is due to increasing public spending on non-tradable goods, it is to lead to an appreciation of the real exchange rate through the relative price channel. However, if government spending falls more heavily on tradable goods, no appreciation occur. Moreover, in the event that public debt is on a unsustainable path, the real exchange rate would depreciate mainly because of the depreciation of the nominal exchange rate.

IV. Data Issues

The dataset used in the paper consists of quarterly time series for the Czech Republic, Hungary, Poland, Slovakia and Slovenia. The period spans from 1992:Q1 to 2002:Q4 for Hungary and from 1993:Q1 to 2002:Q4 for the rest. The dataset also includes Croatia, Estonia, Latvia and Lithuania that are used for the panel estimations. The period runs from 1995:Q1 to 2002:Q4 for Croatia and from 1994:Q1 to 2002:Q4 for the Baltic countries.

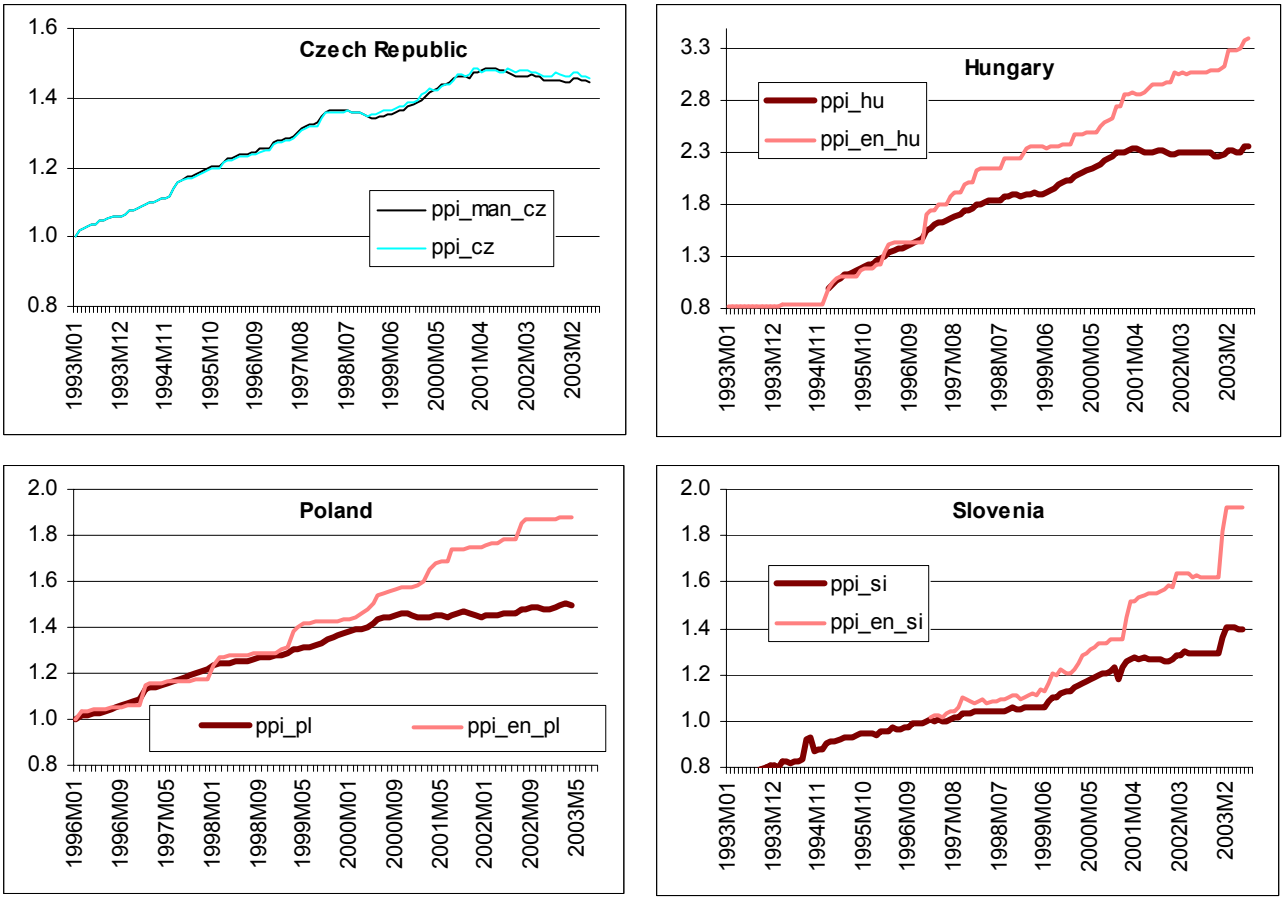
Average labour productivity is computed as labour productivity in the home country relative to labour productivity in Germany. Three measures are used. PROD1 is calculated using industrial

production over industrial employment obtained from the Main Economic Indicators of the OECD or the International Financial Statistics of the IMF. PROD2 is based on similar data but drawn from the WIIW. Finally, PROD3 is obtained as value added over sectoral employment in industry obtained from national accounts. PROD1 and PROD2 may differ slightly on another. In contrast, value added in industry and industrial production based measures turn out to exhibit significantly different developments; without obvious causes or regularities. Note also that PROD1 starts only in 1995 for Estonia and no data for PROD2 is available for the Baltic States.

The other variables used in the paper are as follows:

- Real GDP in the domestic and the reference economies
- Real interest rate differential towards Germany.
- Gross foreign debt as percentage of GDP
- Government debt as percentage of GDP (calculated as cumulated government deficit over GDP)
- Openness computed as nominal exports and imports of goods and services expressed in nominal GDP
- Terms of trade obtained as export prices over import prices. Data is available only for the Czech Republic, Hungary and Poland.
- The difference of *regulated prices* in the home country and those in Germany are mainly based on regulated prices provided by national sources. Thus, series come from the respective national banks for the Czech Republic, Hungary and Poland. Regulated prices for Germany are obtained from the Federal Statistical Office of Germany. Series for Estonia corresponds to that used in Égert (2003b). For the cases of Slovenia, Slovakia, Croatia and Latvia, regulated price are proxied by rents. In Lithuania, the price series on fuel and electricity serve as a proxy. Regulated prices are expected to impact not only on the CPI-deflated real exchange rate, but also on the real exchange rate based on PPI because producer prices indexes in the countries under investigation contain heavily regulated industrial energy prices. Figure 3 below depicts movements in the energy price component of the producer price index for Hungary, Poland and Slovenia. In contrast to this, regulated prices appear to affect little PPI in the Czech Republic as shown by very close co-movements of PPI and the PPI for manufactured goods, the latter being composed of only goods and no energy prices.

Figure 3 Regulated prices in the producer price index



The exchange rate is expressed in foreign currency terms. *The real exchange rate* is calculated using average quarterly nominal exchange rates vis-à-vis the German mark and consumer and producer price indexes.

The data used in the paper are drawn from the following sources: Main Economic Indicators/OECD, International Financial Statistics/IMF, WIIW Monthly Database, NewCronos/Eurostat, Datastream and different national sources (statistical offices and national banks).

The series are transformed into natural logarithm with the exception of the interest rate series. In addition to this, they are also seasonally adjusted either by the national statistical offices or by means of X-12 ARIMA. Exceptions are regulated prices and interest rates series. All series but interest rates are computed with a basis of 100 in 1993 and 1994.

V. Econometric Issues

V.1. Econometric Techniques

V.1.1. Time Series Techniques

It is professional wisdom that a large number of macroeconomic time series are integrated of order 1. This will be tested for employing conventional ADF and PP tests. If series turn out to be I(1) processes, the appropriate estimation technique to use is the cointegration approach. In this paper, we use four different types of cointegration techniques: the Engle and Granger (EG) technique, the Dynamic OLS (DOLS) proposed by Saikkonen (1991) and then popularised by Stock and Watson (1993), the Autoregressive Distributed Lag (ARDL) approach of Pesaran et al. (2001) and the Maximum Likelihood estimator of Johansen. The EG approach to cointegration is based on the following static equation such as:

$$Y_t = \beta_0 + \sum_{i=1}^{n} \beta_i X_{i,t} + \varepsilon_t \qquad (16)$$

Eq.(1) does not account for endogeneity of the regressors and serial correlation in the residuals. The fully modified OLS (FMOLS) estimator of Phillips and Hansen (1990) corrects for these problems based on a nonparametric correction to the OLS estimator. However, other methods such as the DOLS and ARDL models perform better. The DOLS includes leads and lags of the regressors in first differences:

$$Y_t = \beta_0 + \sum_{i=1}^{n} \beta_n X_{i,t} + \sum_{i=1}^{n} \sum_{j=-k_1}^{k_2} \gamma_{i,j} \Delta X_{i,t-j} + \varepsilon_t \qquad (17)$$

with k1 and k2 denoting respectively leads and lags. The error correction form of the ARDL model is given in Eq. (18) where the dependent variable in first differences is regressed on the lagged values of the dependent and independent variables in levels and first differences:

$$\Delta Y_t = \beta_0 + \rho(Y_{t-1} + \sum_{i=1}^{n} \beta_n X_{i,t-1}) + \sum_{j=1}^{l_1} \eta_j \Delta Y_{t-j} + \sum_{i=1}^{n} \sum_{j=0}^{l_2} \gamma_{i,j} \Delta X_{i,t-j} + \varepsilon_t \qquad (18)$$

where l1 and l2 are the maximum lags. The long-term cointegration vector is given as:

$$Y_{t-1} = \frac{\beta_0}{\rho} + \sum_{i=1}^{n} \frac{\beta_n}{\rho} X_{i,t-1} \qquad (19)$$

In the EG, FMOLS and DOLS approaches, whether or not Y and X are cointegrated is examined by testing for unit root in the residuals and applying critical values tabulated in McKinnon (1991). In contrast to this, Pesaran et al. (2001) employ a bounds testing approach.

Using conventional F-tests, the null of $H_0 : \rho = \beta_1 = ... = \beta_n$ is tested against the alternative hypothesis of $H_1 : \rho \neq 0, \beta_1 \neq 0, ..., \beta_n \neq 0$. Pesaran et al. (2001) tabulate two sets of critical values, one for the case when all variables are I(1), i.e. upper bound critical values and another one when all variables are I(0), i.e. lower bound critical values. Critical values are provided for 5 different models of which model (3) with unrestricted intercept and no trend will be used in the paper. If the test statistics is higher than the upper bound critical value, the null of no cointegration is rejected in favour of the presence of cointegration. On the other hand, an F-statistics lower than the lower bound critical value implies the absence of cointegration. In the event that the calculated F-stat lies between the two critical values, there is no clear indication regarding the absence or existence of a cointegrating relationship.

Nonetheless, in the presence of more than one cointegration relationship the aforesaid single-equation approaches cannot be used. Therefore, the Johansen cointegration technique is used for testing for the number of cointegrating vectors in a VAR framework. In the event that only one long-term relationship is found using the trace statistics, the Maximum Likelihood estimates are used as a robustness check.

V.1.2. Panel Unit Root and Cointegration

Similarly to time series, the first step to do when applying panel cointegration is to check for the order of integration of the pooled series. For this purpose, the panel unit root test proposed by Im et al. (2003) (IPS henceforth) is employed. The t-bar statistic is constructed as a mean of individual ADF statistics to test the null hypothesis of a unit root. The IPS uses country-specific autoregressive coefficients from the ADF equation that secures a high degree of heterogeneity across members of the panel. Both model including trend and intercept and model comprising only intercept will be employed. Given the widely acknowledged difficulty to distinguish between deterministic and stochastic trend, if tests cannot reject the null of unit root in levels but can do so in first differences can be taken as evidence for that the series are I(1) processes.

If panel unit root tests confirm the I(1) nature of data, panel cointegration tests are appropriate in detecting the existence of long-term relationships and in estimating the corresponding coefficients. Panel cointegration tests are residual-based tests of the type Engle and Granger:

$$\mathrm{Y_{i,t}} = \alpha_i + \beta_\mathrm{i} \cdot X_{\mathrm{i,t}} + \delta_i \cdot t + \varepsilon_{i,t}, i = 1,2,...,N; t = 1,2,...,T \,. \qquad (20)$$

Kao (1999) proposes five test statistics, of which four are based on a simple DF specification and one estimates an ADF-type equation, that test the null of no cointegration against the alternative hypothesis of cointegration using residuals extracted from equation (20).. By means of Monte

Carlo simulations, Kao (1999) shows that the distribution of the DF_ρ^*, DF_t^* and ADF tests can differ heavily from the standard normal distribution. But the DF_ρ^*, DF_t^* tests turn out to have better size and power properties when compared with the DF_ρ, DF_t and ADF tests.

Pedroni(1999) develops seven tests of which the first four statistics (panel v-statistic, panel rho-statistic, panel pp-statistic, panel ADF-statistic) are based on pooling along within-dimension whereas the last three tests rest on pooling along between-dimension (). The null hypothesis for the panel cointegration tests is that the investigated series are not cointegrated. Of the proposed seven tests statistics, four test are based on pooling along the within-dimension. Only the last three tests (group rho-statistic, group pp-statistic, group ADF-statistic) will be employed because they allow for heterogeneity in the autoregressive term. According to Pedroni (1999), of the seven tests, the group ADF-stat is the most powerful for samples of small size.

Coefficients of the cointegrating vector are then determined using OLS, FMOLS and DOLS estimators. Kao and Chiang (2000) show that both the OLS and FMOLS estimators exhibit small-sample bias and that the DOLS estimator appears to outperform both estimators.

V.2. Testing Strategy

We first conduct a general-to-specific model selection strategy that involves top-down and bottom-up F pre-search coupled with sample split analysis so as to identify blocks of statistically significant variables. Departing with 4 different sets of variables described in Section IV, the general-to-specific approach to model selection is performed using the OLS estimation technique. The residuals of the models chosen are subsequently checked for stationarity à la Engle and Granger and the selected models are taken as an input for the estimation of the DOLS and ARDL. Leads and lags are determined based on the usual information criteria: (Schwarz, Akaike and Hannan-Quinn).

Next, the VAR-based Johansen approach is used to verify the number of cointegration relationships that might link the variables. The detection of a single long-term relationships that turns out to be stable over time then validates results of the single-equation methods. The Johansen technique involves the roots of the VAR model to be verified (to ensure stationarity of the AR processes), tests for normality and serial correlation. Furthermore, both the rank of cointegration and parameter constancy are analysed. How a model is finally selected depends largely on whether there is consensus among the four different tests on cointegration and whether or not all the variables included into the model are found statistically significant and sign according to our expectations described in Section IV. As regards panel estimates, a less sophisticated but still comprehensive testing strategy is applied: Seven specifications chosen on

time-series results and on economic grounds are tested for three panels. Robustness is partly checked for including the three productivity measurements and real GDP one after another.

VI. Real Exchange Rate Determination

VI.1. Time Series Estimates

Because conventional unit root tests, i.e. ADF and PP indicate that most of the series are not stationary in levels but turn out to be stationary in first differences, the cointegration techniques developed appear the most appropriate approach to test for long-term relationships connecting the real exchange rate to the underlying fundamentals.

To begin with, it is noteworthy that one encounters problems very notorious when using relatively short time series for transition countries. First, outliers in the data may occur because of some outstanding events such as exchange rate crisis happening. Second, structural breaks related to a change in the overall macroeconomic framework or in monetary and exchange rate regimes can also render the use of econometric estimates more difficult. Lifting of capital controls, a shift from pegged exchange rates towards floating and the introduction of Direct Inflation Targeting are examples for this. Nonetheless, changes can also occur in a smoother fashion. The continuous nature of the change means that some variables may have gained in importance only at a later point, e.g. in the late 1990s, when preparation for accession to the European Union started to accelerate.

Employing the EG, DOLS, ARDL and Johansen cointegration techniques, estimations are performed based on two time periods (1993-2002 and 1994-2002) for the Czech Republic, Poland, Slovakia and Slovenia and using three time periods, namely 1992-2002, 1993-2002, 1994-2002 for the case of Hungary.

Results obtained for time series are reported in Tables 2 to 6. Generally, cointegration is found only for a limited number of relationships and even so, it could not be verified with all four methods simultaneously. In many cases when cointegration is confirmed, only part of the exogenous variables turn out to be statistically significant, when excluding these variables, cointegration is no longer found.

Let us now turn to country-specific results. With regard to the **Czech Republic**, cointegration of variables that are significant in the determined relationships can be detected in few equations, all for the time period of 1994-2002. The following specifications are retained as viewed the most reliable and economically the most compelling.

$$RERCPI = RERCPI(PROD3, REG, GOV, TOT)$$

$$RERCPI = RERCPI(PROD3, REG, FDEBT)$$

All variables are statistically significant and are negatively related to changes in the CPI-based real exchange rate, i.e. an increase in the variables entails an appreciation of the real exchange rate. Hence, even an increase in government debt leads to real appreciation. Furthermore, similar results are found when regressing the PPI-based real exchange rate on the same variables confirming econometrically our intuition that the service price channel has only a limited role in determining the real exchange rate.

Table 2a Time series cointegration tests for the CPI-based real exchange rate, Czech Republic

Czech Republic, 1994, eq4

	EG		DOLS				ARDL(2,1)		JOH.		
			SIC(0,1)		AIC,HQ(1,2)		SIC,AIC,HQ		M3,k=2		
SIC	1	-4.839**	3	-5.422**	4	-5.287**	7.281**	5%	R=0	105.39***	RS ok
AIC	1	-4.839**	3	-5.422**	4	-5.287**			R=1	55.15***	AC ok
HQ	1	-4.839**	3	-5.422**	4	-5.287**			R=2	24.38	JB 0.056
									R=3	8.99	ST 1
									R=4	1.29	
	coeff	t-stat	Coeff	t-stat	coeff	t-stat	coeff	t-stat	coeff	t-stat	
CONST	0.004	0.249	0.016	0.776	0.05	1.236	-0.003	-0.175			
PROD3	-0.324	-4.762	-0.51	-5.313	-0.857	-4.347	-0.349	-4.233	-4.406	-7.295	
REGD	-0.136	-2.132	-0.103	-1.369	-0.135	-1.036	-0.112	-2.169	-1.699	-3.078	
GOV	-2.748	-6.603	-2.903	-5.445	-2.083	-2.075	-2.759	-4.452	8.306	2.196	
TOT	-1.021	-4.061	-1.132	-4.105	-1.176	-2.132	-1.007	-3.670	-1.346	-0.621	

Note: *,** and *** denote respectively the presence of cointegration at the 10%, 5% and 1% levels, respectively. EG represent the Engle and Granger residual based tests. SIC, AIC and HQ in the first column of the Table stand for the Schwarz, Akaike and the Hannan-Quinn information cirteria based on which the lag length is selected for the ADF tests. Below DOLS and ARDL are shown the information criteria and, in parentheses, the chosen leads and lags (DOLS) and lags for dY and dX (ARDL). The test statistics shown below ARDL is the F-stat as in Pesaran et al. (2001). JOH represents the Johansen cointegration technique. k stands for the lag length chosen for the VAR. The trace-test statistics are given below. In the last column, RS and AC are roots of the model and autocorrelation. "ok" indicates that the inverse roots of the model are lower than 1 and the absence of serial correlation in the residuals. JB stands for the Jarque-Bera multivariate normality tests. A figure higher than 0.05 indicates that normality is accepted. Finally, ST indicates the number of cointegration relationship(s) that turn out to be stable over time.

Czech Republic, 1994, eq8

	EG		DOLS				ARDL(1,1)		JOH.		
			SIC,HQ(0,1)		AIC(1,1)		SIC,AIC,HQ		M3,k=3		
SIC	1	-5.199**	3	-5.528**	3	-5.339**	6.84**		R=0	73.04***	RS ok
AIC	1	-5.199**	3	-5.528**	3	-5.339**			R=1	32.23***	AC ok
HQ	1	-5.199**	3	-5.528**	3	-5.339**			R=2	8.99	JB 0..016
									R=3	0.01	ST 1
	coeff	t-stat	Coeff	t-stat	coeff	t-stat	coeff	t-stat	coeff	t-stat	
CONST	-0.013	-0.961	-0.01	-0.552	0.011	0.538	0.008	0.37			
PROD2	-0.701	-5.51	-0.948	-7.198	-1.021	-6.568	-0.793	-4.108	-0.649	-16.641	
REGD	-0.362	-6.713	-0.361	-3.674	-0.379	-2.667	-0.471	-3.066	-0.457	-32.643	
FDEBT	0.19	4.089	0.292	4.043	0.308	3.063	0.326	3.514	0.278	18.533	

Table 2b Time series cointegration tests for the PPI-based real exchange rate, Czech Republic

Czech Republic, 1994, eq4

	EG		DOLS				ARDL (2,1)		JOH.		
			SIC(0,1)		AIC,HQ(1,2)		SIC,AIC,HQ		M3,k=2		
SIC	1	-4.902**	3	-5.784**	4	-5.449**	7.594**		R=0	100.64***	RS no
AIC	1	-4.902**	3	-5.784**	4	-5.449**			R=1	49.04***	AC ok
HQ	1	-4.902**	3	-5.784**	4	-5.449**			R=2	21.60	JB 0..092
									R=3	6.34	ST 1
									R=4	0.24	
	coeff	t-stat	coeff	t-stat	coeff	t-stat	coeff	t-stat	coeff	t-stat	
CONST	0.013	0.976	0.039	1.859	0.071	1.684	0.02	1.267			
PROD3	-0.294	-4.49	-0.52	-5.442	-0.825	-4.017	-0.375	-4.456	-2.065	-5.736	
REGD	-0.003	-0.043	0.028	0.371	0.012	0.087	-0.011	-0.203	-0.937	-1.928	
GOV	-2.534	-6.334	-2.652	-4.992	-2.093	-2.001	-2.282	-3.962	6.784	2.028	
TOT2	-0.807	-3.341	-1.054	-3.839	-1.098	-1.911	-0.839	-3.396	-6.116	-3.424	

Czech Republic, 1994, eq8

	EG		DOLS(1,1)		ARDL(1,1)		JOH.		
			SIC,AIC,HQ		SIC,AIC,HQ		M3,k=3		
SIC	1	-5.122**	4	-5.604**	6.163**		R=0	84.06***	RS ok
AIC	1	-5.122**	4	-5.604**			R=1	39.56***	AC ok
HQ	1	-5.122**	4	-5.604**			R=2	9.23	JB 0..012
							R=3	0.06	ST 1
	Coeff	t-stat	coeff	t-stat	Coeff	t-stat	coeff	t-stat	
CONST	-0.002	-0.19	0.032	1.655	0.023	1.079			
PROD2	-0.632	-5.155	-0.974	-6.791	-0.716	-3.927	-0.699	-19.971	
REGD	-0.22	-4.227	-0.21	-1.596	-0.317	-2.334	-0.359	-25.643	
FDEBT	0.189	4.236	0.259	2.793	0.293	3.145	0.278	19.857	

When analysing the case of **Hungary**, two meaningful cointegration relationships can be established for the period of 1993-2002. The only difference is that the first includes productivity whereas the second one contains real GDP.

$$RERCPI = RERCPI(PROD2, FDEBT, GOV, OPEN)$$

$$RERCPI = RERCPI(PROD3, FDEBT, OPEN)$$

It appears that in both specifications, only productivity bears a negative sign to the real exchange rate. Given that the coefficient is relatively high, this supports the view that real appreciation can be traced back to the changing ability to produce goods of higher value added. On the other hand, an increase in foreign and public debt and openness leads to a real depreciation of the Hungarian forint vis-à-vis the German mark.

Regulated prices and the real interest rate differential are not included into the long-term relationship. One reason for this might be the crawling peg regime that prevailed until 2001. In this framework, the central bank targeted the real exchange rate conditioned on productivity growth. Given the narrow fluctuation bands and capital controls, the exchange rate did not fully respond to changes in the interest rate differential. The same applies to regulated prices. The rate of crawl and thus the devaluations were determined under the assumption that increases in

regulated prices have no impact on the equilibrium exchange rate (the exchange rate that does not threaten the external balance).

Table 3a Time series cointegration test for the CPI-based real exchange rate Hungary

Hungary, 1993 eq4

	EG		DOLS				ARDL(1,0)		JOH		
			SIC(0,0)		AIC,HQ(2,2)		SIC,AIC,HQ		M3,k=3		
SIC	0	-5.036**	1	-5.073**	0	-5.393**	2.742[a]		R=0	93.61***	RS no
AIC	0	-5.036**	1	-5.073**	0	-5.393**			R=1	58.77***	AC ok
HQ	0	-5.036**	1	-5.073**	0	-5.393**			R=2	33.26**	JB 0.011
									R=3	10.81	ST 1 or 2?
									R=4	0.54	
	coeff	t-stat	coeff	t-stat	coeff	t-stat	coeff	t-stat	coeff	t-stat	
CONST	0.014	1.431	0.01	0.847	0.119	1.789	0.021	0.853			
PROD2	-1.156	-13.642	-1.109	-10.982	-0.969	-2.426	-0.963	-2.082	-1.121	-20.757	
FDEBT	0.397	6.475	0.356	5.549	-0.062	-0.245	0.228	1.208	0.107	2.744	
GOV	1.363	5.019	1.601	5.853	3.041	6.453	1.778	2.111	2.465	10.489	
OPEN	0.368	6.986	0.299	4.41	-0.028	-0.086	0.141	0.76	0.169	4.568	

Note: As for Table 2.

Hungary, 1994 eq5

	EG		DOLS				ARDL(1,2)		JOH		
			SIC(1,3)		AIC,HQ(2,3)		ARDL_SIC		M3,k=3		
SIC	0	-2.136	1	-4.848**	1	-6.825**	3.466[a]		R=0	74.14***	RS no
AIC	0	-2.136	4	-4.834**	4	-4.69**			R=1	20.46	AC ok
HQ	0	-2.136	4	-4.834**	4	-4.69**			R=2	7.77	JB 0.002
									R=3	1.18	ST 1
	Coeff	t-stat	coeff	t-stat	coeff	t-stat	coeff	t-stat	coeff	t-stat	
CONST	0.04	1.733	-0.052	-3.593	-0.047	-1.633	-0.031	-1.234			
PROD3	-1.306	-4.37	-2.344	-12.02	-2.489	-7.493	-2.099	-3.164	-2.099	-22.570	
FDEBT	0.553	4.25	0.811	9.482	0.908	6.795	0.622	2.551	0.730	19.211	
OPEN	0.148	1.296	0.59	6.855	0.633	4.052	0.434	2.346	0.511	13.447	

Note: As for Table 2.

Table 3b Time series cointegration tests for the PPI-based real exchange rate, Hungary

Hungary, 1993 eq4

	EG		DOLS				ARDL(1,0)		JOH		
			SIC(0,0)		AIC,HQ(2,2)		SIC,AIC,HQ		M3,k=3		
SIC	0	-5.036**	1	-5.073**	0	-5.393**	2.742[a]		R=0	54.44	RS no
AIC	0	-5.036**	1	-5.073**	0	-5.393**			R=1	33.36	AC ok
HQ	0	-5.036**	1	-5.073**	0	-5.393**			R=2	15.70	JB 0.014
									R=3	5.11	ST 1 ?
									R=4	0.10	
	coeff	t-stat	coeff	t-stat	Coeff	t-stat	coeff	t-stat	coeff	t-stat	
CONST	0.014	1.431	0.01	0.847	0.119	1.789	0.021	0.853			
PROD2	-1.156	-13.642	-1.109	-10.982	-0.969	-2.426	-0.963	-2.082	-0.701	-10.785	
FDEBT	0.397	6.475	0.356	5.549	-0.062	-0.245	0.228	1.208	0.412	8.583	
GOV	1.363	5.019	1.601	5.853	3.041	6.453	1.778	2.111	2.302	9.473	
OPEN	0.368	6.986	0.299	4.41	-0.028	-0.086	0.141	0.76	0.032	0.711	

Note: As for Table 2.

Hungary, 1994 eq5

	EG		DOLS				ARDL				JOH		
			SIC,HQ(2,3)		AIC(3,3)		SIC(1,0)		AIC,HQ(1,1)		M3,k=3		
SIC	0	-2.747	1	-5.936**	1	-8.101**	2.109		4.032*		R=0	45.09*	RS no
AIC	0	-2.747	1	-5.936**	3	-5.068**					R=1	20.24	AC ok
HQ	0	-2.747	1	-5.936**	3	-5.068**					R=2	8.16	JB 0.110
											R=3	3.58	ST 1?
	coeff	t-stat	coeff	t-stat	coeff	t-stat	coeff	t-stat	Coeff	t-stat	coeff	t-stat	
CONST	0.056	4.15	-0.001	-0.017	-0.058	-0.787	0.088	1.959	0.059	2.357			
PROD3	-0.7	-3.993	-1.967	-5.821	-2.951	-2.735	-0.565	-0.924	-0.902	-2.077	-1.098	-7.572	
FDEBT	0.543	7.117	0.958	7.041	1.319	3.636	0.286	0.839	0.401	1.677	0.549	9.305	
OPEN	-0.009	-0.139	0.486	3.059	0.927	1.916	-0.165	-0.868	0.004	0.029	0.056	1.000	

Note: As for Table 2.

With regard to **Poland**, several long-term specifications are found to satisfy the diagnostic tests outlined in Section V. The first relates the real exchange rate entirely to productivity and the real interest rate differential, the second includes in addition openness and foreign debt.

$$RERCPI = RERCPI(PROD1/PROD3, RIR)$$

$$RERCPI = RERCPI(PROD3, RIR, OPEN, FDEBT)$$

Table 4a Time series cointegration tests for the CPI-based real exchange rate Poland

Poland, 1993 eq1

	EG		DOLS				ARDL				JOH	
			SIC(2,0)		AIC,HQ(3,3)		SIC(1,0)		AIC,HQ(3,0)		M3,k=2	
SIC	0	-3.552	0	-4.134**	0	-6.486**	3.552[a]		5.533**		R=0	21.69
AIC	0	-3.552	0	-4.134**	0	-6.486**					R=1	5.04
HQ	0	-3.552	0	-4.134**	0	-6.486**					R=2	1.19
	coeff	t-stat	coeff	t-stat	coeff	t-stat	coeff	t-stat	coeff	t-stat		
CONST	-0.046	-3.51	-0.054	-4.1	-0.078	-3.665	-0.06	-2.382	-0.054	-2.463		
PROD1	-0.836	-14.029	-0.893	-14.277	-1.056	-14.051	-0.83	-2.878	-0.808	-3.46		
INTCPI	-0.008	-4.269	-0.009	-4.501	-0.007	-3.049	-0.008	-2.059	-0.008	-2.398		

Note: As for Table 2.

Poland, 1993 eq5

	EG		DOLS(3,3)		ARDL(1,0)		JOH.		
			SIC,AIC,HQ		SIC,AIC.HQ		M3,k=2		RS ok
SIC	0	-3.674	2	-5.911**	4.634**		R=0	58.40***	AC ok
AIC	0	-3.674	2	-5.911**			R=1	25.44	JB 0.390
HQ	0	-3.674	2	-5.911**			R=2	9.89	ST 1
							R=3	0.32	
	coeff	t-stat	coeff	t-stat	coeff	t-stat	coeff	t-stat	
CONST	-0.026	-1.497	-0.021	-0.386	0.007	0.224			
PROD3	-0.988	-13.67	-1.215	-6.748	-1.075	-3.757	-0.850	-7.870	
INTCPI	-0.006	-2.892	-0.005	-0.7	-0.008	-2.109	-0.023	-11.500	
FDEBT	0.165	3.005	0.322	1.465	0.338	3.234	0.269	3.165	

Note: As for Table 2.

Poland, 1993 eq6

	EG		DOLS				ARDL				JOH		
			SIC,HQ(0,1)		AIC(1,2)		SIC(1,0)		AIC,HQ(1,1)		M3,k=2		
SIC	0	-4.136	0	-5.295**	2	-6.388**	5.977**		3.966*		R=0	91.91**	RS no
AIC	3	-4.088	0	-5.295**	2	-6.388**					R=1	39.93	AC ok
HQ	0	-4.136	0	-5.295**	2	-6.388**					R=2	18.36	JB 0.014
											R=3	3.99	ST 1
											R=4	0.03	
	coeff	t-stat	coeff	t-stat	coeff	t-stat	coeff	t-stat	coeff	t-stat	coeff	t-stat	
CONST	-0.056	-3.052	-0.084	-5.005	-0.117	-4.293	-0.073	-2.123	-0.083	-1.978			
PROD1	-1.1	-7.932	-1.342	-10.031	-1.565	-6.62	-1.731	-5.04	-1.62	-3.898	-1.005	-11.824	
INTCPI	-0.009	-3.959	-0.012	-5.234	-0.017	-4.198	-0.009	-1.798	-0.011	-1.79	-0.016	-16.000	
GOV	0.912	1.726	3.011	5.203	4.417	3.338	4.239	3.805	4.467	4.047	1.748	4.883	
OPEN	0.216	1.73	0.393	3.35	0.665	3.43	0.43	2.02	0.484	2.266	0.373	4.973	

Note: As for Table 2.

Poland, 1994 eq1

	EG		DOLS(2,3)		ARDL(1,0)		JOH		
			SIC,AIC.HQ		SIC,AIC,HQ		M3,k=3		
SIC	0	-3.451	0	-7.575**	3.543[a]		R=0	54.40**	RS ok
AIC	0	-3.451	3	-4.768**			R=1	20.93	AC ok
HQ	0	-3.451	3	-4.768**			R=2	4.87	JB 0.003
							R=3	0.03	ST 1
	coeff	t-stat	coeff	t-stat	Coeff	t-stat	coeff	t-stat	
CONST	-0.01	-0.325	-0.026	-0.381	-0.017	-0.246			
PROD1	-0.907	-10.63	-1.02	-6.571	-0.923	-2.843	-0.944	-11.238	
INTCPI	-0.007	-3.154	-0.014	-2.688	-0.01	-2.329	-0.018	-11.250	
FDEBT	0.14	1.640	0.299	1.474	0.181	0.948	0.333	3.742	

Note: As for Table 2.

Table 4b Time series cointegration tests for the PPI-based real exchange rate Poland

Poland, 1993 eq1

	EG		DOLS				ARDL(1,0)		JOH		
			SIC,HQ(0,0)		AIC(2,3)		SIC,AIC,HQ		M3,k=1		
SIC	0	-5.608**	0	-6.229**	0	-7.657**	13.601**		R=0	41.05***	RS ok
AIC	0	-5.608**	0	-6.229**	2	-2.647			R=1	4.06	AC ok
HQ	0	-5.608**	0	-6.229**	2	-2.647			R=2	0.19	JB 0.685
	coeff	t-stat	coeff	t-stat	coeff	t-stat	coeff	t-stat	t-stat	coeff	ST 1
CONST	-0.013	-1.629	-0.024	-3.499	-0.03	-3.096	-0.025	-3.293			
PROD1	-0.483	-12.305	-0.458	-12.873	-0.634	-10.78	-0.453	-4.83	-0.453	-13.324	
INTPPI	-0.006	-5.746	-0.007	-7.536	-0.005	-3.666	-0.007	-5.386	-0.007	-7.778	

Note: As for Table 2.

Poland, 1993 eq2

	EG		DOLS				ARDL(1,0)		JOH		
			SIC,HQ(0,0)		AIC(2,3)		SIC,AIC,HQ		M3,k=6		
SIC	0	-4.815**	0	-4.847**	0	-6.105**	6.985**		R=0	43.96***	RS no
AIC	0	-4.815**	0	-4.847**	2	-1.69			R=1	5.63	AC ok
HQ	0	-4.815**	0	-4.847**	2	-1.69			R=2	1.16	JB 0.000
	coeff	t-stat	coeff	t-stat	coeff	t-stat	coeff	t-stat	t-stat	coeff	ST 1?
CONST	-0.006	-0.627	-0.017	-1.953	-0.025	-1.531	-0.024	-1.882			
PROD2	-0.500	-10.447	-0.478	-10.619	-0.757	-9.035	-0.458	-3.168	-0.544	-23.652	
INTPPI	-0.006	-4.731	-0.007	-5.795	-0.001	-0.605	-0.007	-3.699	-0.004	-6.667	

Note: As for Table 2.

Poland, 1993 eq3

	EG		DOLS(0,0)		ARDL(1,0)		JOH		
	EG_cointegration		SIC,AIC,HQ		SIC,AIC,HQ		M3,k=6		
SIC	0	-4.945**	0	-6.194**	11.309**		R=0	56.22***	RS no
AIC	0	-4.945**	0	-6.194**			R=1	18.28**	AC ok
HQ	0	-4.945**	0	-6.194**			R=2	2.41	JB 0.006
	coeff	t-stat	coeff	t-stat	coeff	t-stat	t-stat	coeff	ST 1
CONST	-0.022	-3.067	-0.032	-4.909	-0.036	-3.972			
PROD3	-0.516	-12.353	-0.469	-12.327	-0.454	-4.32	-0.557	-46.417	
INTPPI	-0.006	-6.008	-0.008	-7.841	-0.008	-5.059	-0.006	-20.000	

Note: As for Table 2.

Both productivity and the real interest rate differential have the expected, negative sign vis-à-vis the real exchange rate whereas foreign debt and openness bear a positive sign to the real exchange rate, similarly to the case of Hungary. Regulated prices are also not found to be a determinant of the real exchange rate. Likewise, this may be due to the fact that exchange rate determination changed during the period under investigation. Furthermore, GDP does not appear to enter significantly the long-term relationship.

As regards **Slovakia**, it turned out to be most complicated to find a relationship that could be considered reasonable on economic and econometric grounds. The following three cointegration relationships could be established for 1993 to 2002:

$$RERCPI = RERCPI(GDP, REG)$$

$$RERCPI = RERCPI(GOV, REG)$$

$$RERCPI = RERCPI(GDP, RIR)$$

Table 5 Time series cointegration test, Slovakia

Slovakia, 1993, eq1

	EG		DOLS(0,0) SIC,AIC,HQ		ARDL(2,0) SIC,AIC,HQ		Johansen M3,k=1	
SIC	1	-3.71*	2	-3.851*	5.686**		R=0	10.67
AIC	2	-3.718*	2	-3.851*			R=1	2.54
HQ	1	-3.71*	2	-3.851*			R=2	0.03
	Coeff	t-stat	coeff	t-stat	coeff	t-stat		
CONST	0.007	0.685	0.007	0.518	0.025	1.311		
GDP	-0.602	-5.58	-0.61	-5.361	-0.655	-2.863		
REGD	-0.343	-5.571	-0.346	-5.389	-0.333	-3.247		

Note: As for Table 2.

Slovakia, 1993, eq5

	EG		DOLS(0,0)		ARDL(2,0) SIC,AIC,HQ		Johansen M3,k=1	
SIC	2	-4.113**	2	-4.014**	4.654*		R=0	14.91
AIC	2	-4.113**	2	-4.014**			R=1	5.59
HQ	2	-4.113**	2	-4.014**			R=2	0.19
	Coeff	t-stat	Coeff	t-stat	coeff	t-stat		
CONST	0.01	0.879	0.008	0.493	0.01	0.462		
REGD	-0.31	-3.922	-0.318	-3.78	-0.303	-2.512		
GOV	-1.305	-4.667	-1.284	-4.307	-1.312	-2.255		

Note: As for Table 2.

Slovakia, 1993, eq2

	EG		DOLS SIC(0,0)		AIC(3,1)		HQ(0,2)		ARDL SIC(2,0)		AIC(2,3)		HQ(1,2)		Johansen M3,k=1	
SIC	0	-2.81	0	-3.462	0	-3.227	1	-4.429**	4.624*		5.01**		3.891[A]		R=0	17.50
AIC	1	-3.383	0	-3.462	2	-4.177**	1	-4.429**							R=1	4.52
HQ	100%	-3.383	0	-3.462	2	-4.177**	1	-4.429**							R=2	0.78
	coeff	t-stat	coeff	t-stat	coeff	t-stat	coeff	t-stat	coeff	t-stat	coeff	t-stat	Coeff	t-stat		
CONST	0.064	5.553	0.071	5.518	0.088	3.706	0.113	6.376	0.075	2.149	0.11	2.924	0.123	2.908		
GDP	-1.337	-25.118	-1.372	-25.39	-1.437	-23.263	-1.458	-26.622	-1.37	-3.145	-1.457	-3.493	-1.465	-3.117		
INTCPI	0.005	5.768	0.006	6.212	0.003	3.085	0.006	6.365	0.006	3.313	0.006	3.637	0.007	3.222		

Note: As for Table 2.

Only real GDP, government debt and regulated prices enter the long-term relationship. Note also that the real interest rate differential is also included into the third long-term relationship. However, it has the incorrect sign.

It seems that government debt and GDP reflect similar developments: Until 1998, the reform process was rather sluggish in Slovakia and public expenditures increased much faster than GDP[8]. The expansionary fiscal policy then became unsustainable; and the Slovak koruna had to be floatedin 1998. After a period of turbulence when the real exchange rate depreciated and government spending and GDP also decelerated, a more coherent reform strategy including the attraction of large FDI was implemented. This marked the return to higher growth and higher government spending. Therefore, the only relationship stable over the whole period studied could be that including government spending/GDP and regulated prices[9].

[8] Real public consumption expenditure measured as in the national accounts increased by 50% between 1993-1997, compared with 25% growth of real GDP. See Beblavy(2002) for more details on Slovak exchange rate policy.

[9] The inclusion of a dummy variable for the time period of currency crisis reveals that also foreign debt is significant. Its impact on the real exchange rate is however negative: an increase in foreign debt is leading to an appreciation. It seems that the debt servicing effect of the inflow of foreign capital has not yet materialised: in 2002, income payments amounted to only 2% of GDP, marking the highest level since 1993.

In Slovenia, one of the stable relationships that can be detected is the one that connects the real exchange rate to regulated prices and the real interest rate differential. Productivity also enters the long-term relationship.

As expected, an increase/decrease in regulated prices is found to bring about an appreciation/depreciation. However, the sign on the real interest rate differential does not correspond to our expectation as an increase in the real interest rate differential leads to a depreciation of the real exchange rate.

Table 6 Time series cointegration test, Slovenia

Slovenia, 1993, eq4

	EG		DOLS(2,3) SIC,AIC,HQ		ARDL(2,3) SIC,AIC,HQ		Johansen M3,k=2	
SIC	0	-5.041***	1	-6.695***	10.127**		R=0	63.26***
AIC	1	-4.092***	1	-6.695***			R=1	21.41***
HQ	0	-5.041***	1	-6.695***			R=2	6.18***
	Coeff	t-stat	coeff	t-stat	Coeff	t-stat		
CONST	-0.107	-12.28	-0.144	-9.02	-0.111	-1.812	RS	Ok
REGD	-0.158	-16.225	-0.131	-8.946	-0.16	-3.281	AC	Ok
INTCPI	0.004	6.683	0.005	5.48	0.001	0.474	JB	0.504

Note: As for Table 2.

Slovenia, 1993, eq5

	EG		DOLS SIC(2,0)		AIC, HQ(3,3)		ARDL SIC(1,1)		AIC(2,3)		HQ(2,1)		JOH. M3,k=2		
SIC	0	-3.92*	0	-2.865	0	-3.966**	3.711[a]		4.56*		2.482		R=0	50.00***	RS ok
AIC	3	-1.426	0	-2.865	4	-3.747*							R=1	12.90	AC ok
HQ	0	-3.92*	0	-2.865	4	-3.747*							R=2	2.14	JB 0.265
	coeff	t-stat	coeff	t-stat	coeff	t-stat	coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	ST 1
CONST	-0.124	-10.779	-0.197	-16.349	-0.178	-10.096	-0.035	-0.156	-0.804	0.912	-0.015	-0.033	0.028	2.592	
PROD1	-0.742	-10.857	-0.438	-6.777	-0.652	-6.439	-1.119	-1.306	2.424	-0.901	-1.332	-0.868	-0.273	-3.138	
INTCPI	0.004	3.946	0.01	10.523	0.007	4.555	-0.011	-1.002	0.089	-1.924	-0.021	-0.868	0.014	12.727	

Note: As for Table 2.

These findings can be explained to a large extent by monetary and exchange rate policies in Slovenia (Caprirolo and Lavrac, 2003), which aimed a balanced current account and a corresponding real exchange rate position. Any excess money, e.g. due to capital inflows, has been systematically sterilised by the central bank. This is why it is rather likely that the real interest rate is the endogenous variable, and the real exchange rate the exogenous one. However, it is worthy of mention that Slovenia has attracted, deliberately, the least FDI in terms of GDP during the period of 1993-2002.

The fact that increasing regulated prices lead to a real appreciation of the exchange rate suggest that this has not undermined competitiveness of Slovene exports as it has not worsened the trade balance and the current account. Furthermore, insignificant labour productivity also means that it may not be the BS effect that drives service prices, but adjustments in regulated prices.

To sum up briefly the findings based on time series econometric estimates, establishing cointegration relationships between the real exchange rate and the fundamentals turns out to be a difficult task. Importantly, the detected long-term relationships differ by a large margin across the

five CEE acceding countries under investigation. Whereas for the Czech Republic, Hungary and Poland, it is possible to determine reasonable relationships reflecting aspects of their catch-up process, in the cases of Slovakia and Slovenia, results appear to be hampered by country specific factors.

An increase in the productivity differential appears to trigger an appreciation of the real exchange rate in the cases of the Czech Republic, Hungary and Poland. The econometric specifications clearly shows that this is only partly connected with the traditional BS effect. Because productivity is also strongly related to the PPI-based real exchange change, the expected link between real exchange rate and productivity may be evidence enough for the fact that a larger chunk of the real appreciation is due to changes in the supply-side of the economy and in preferences of both domestic and foreign consumers towards domestically produced goods

VI.2. Panel Estimates

The panel investigation is carried out on different panels in order to check for robustness of the results. Note that all panels are composed of quarterly time series such as described in Section IV dealing with data issues. First, panel cointegration tests are performed on a panel composed of the five countries, which are dealt with beforehand, and this for the periods 1993 to 2002 and 1994 to 2002. Subsequently, the three Baltic countries, i.e. Estonia, Latvia and Lithuania are added to the panel for which econometric tests are performed for the periods running from 1994 to 2002 and 1995 to 2002. Finally, the panel is enlarged to nine couuntries with the inclusion of Croatia.

Seven specifications are estimated for each panel and for each time period. They are based upon results of the time series analysis and thus are the combination of variables found significant in the time series tests (See Table 7 below). Note that each specification has been estimated using alternatively the different productivity measures (PROD1,PROD2,PROD3) and the rate of growth of GDP. Hence, a total of 28 equations is estimated for each and every panel. For panels including 8 and 9 countries, only PROD1 and PROD3 are used because of lack of data.

Table 7 Estimated panel specifications

	Y	X1	X2	X3	X4	X5
Eq1 :	RERCPI	PROD1/PROD2/PROD3/GDP	INTCPI	REGDIFF	FDEBT	OPEN3
Eq2 :	RERCPI	PROD1/PROD2/PROD3/GDP	INTCPI	REGDIFF	FDEBT	GOV
Eq3 :	RERCPI	PROD1/PROD2/PROD3/GDP	INTCPI	REGDIFF	OPEN3	GOV
Eq4 :	RERCPI	PROD1/PROD2/PROD3/GDP	INTCPI	FDEBT		
Eq5 :	RERCPI	PROD1/PROD2/PROD3/GDP	INTCPI	REGDIFF	FDEBT	
Eq6 :	RERCPI	PROD1/PROD2/PROD3/GDP	INTCPI	REGDIFF	GOV	
Eq7 :	RERCPI	PROD1/PROD2/PROD3/GDP	INTCPI	REGDIFF	OPEN3	

Table 7a Panel cointegration tests, Panel 5 (p-values)

		DF_ϱ	$DF_{t\varrho}$	DF_ϱ *	$DF_{t\varrho}$ *	adf(1)	adf(4)	p5_n	p5_c	p5_t	p6_n	p6_c	p6_t	p7_n	p7_c	p7_t
Panel 5, 1993-2002																
1993_eq1	prod1	0.000	0.003	0.000	0.003	0.004	0.020	0.003	0.000	0.000	0.038	0.004	0.000	0.093	0.013	0.001
	prod2	0.000	0.001	0.000	0.002	0.003	0.006	0.005	0.001	0.000	0.090	0.012	0.001	0.182	0.034	0.003
	prod3	0.023	0.052	0.000	0.022	0.024	0.110	0.001	0.000	0.000	0.001	0.000	0.000	0.001	0.000	0.000
	gdp	0.063	0.083	0.000	0.033	0.035	0.134	0.000	0.000	0.000	0.001	0.000	0.000	0.001	0.000	0.000
1993_eq2	prod1	0.000	0.001	0.000	0.001	0.001	0.002	0.004	0.001	0.000	0.095	0.013	0.001	0.271	0.065	0.008
	prod2	0.000	0.001	0.000	0.000	0.000	0.000	0.008	0.001	0.000	0.135	0.022	0.002	0.375	0.110	0.017
	prod3	0.000	0.002	0.000	0.001	0.001	0.003	0.004	0.001	0.000	0.060	0.007	0.000	0.222	0.047	0.005
	gdp	0.011	0.011	0.000	0.005	0.004	0.018	0.001	0.000	0.000	0.020	0.002	0.000	0.062	0.007	0.000
1993_eq3	prod1	0.000	0.000	0.000	0.001	0.001	0.002	0.006	0.001	0.000	0.212	0.044	0.005	0.495	0.179	0.036
	prod2	0.000	0.000	0.000	0.000	0.000	0.000	0.012	0.002	0.000	0.299	0.075	0.010	0.357	0.296	0.079
	prod3	0.001	0.003	0.000	0.002	0.002	0.004	0.003	0.000	0.000	0.039	0.004	0.000	0.157	0.028	0.003
	gdp	0.011	0.012	0.000	0.005	0.004	0.020	0.001	0.000	0.000	0.016	0.001	0.000	0.050	0.005	0.000
1993_eq4	prod1	0.000	0.003	0.000	0.003	0.004	0.012	0.132	0.032	0.003	0.366	0.216	0.030	0.228	0.353	0.073
	prod2	0.000	0.002	0.000	0.002	0.003	0.004	0.193	0.052	0.006	0.294	0.280	0.048	0.174	0.428	0.105
	prod3	0.263	0.437	0.000	0.147	0.165	0.207	0.017	0.003	0.000	0.019	0.001	0.000	0.005	0.000	0.000
	gdp	0.258	0.258	0.000	0.089	0.087	0.210	0.027	0.005	0.000	0.104	0.008	0.000	0.065	0.004	0.000
1993_eq5	prod1	0.000	0.003	0.000	0.003	0.004	0.018	0.019	0.004	0.000	0.203	0.033	0.003	0.351	0.082	0.009
	prod2	0.000	0.002	0.000	0.002	0.003	0.005	0.033	0.007	0.001	0.277	0.054	0.005	0.436	0.120	0.017
	prod3	0.023	0.042	0.000	0.019	0.024	0.146	0.003	0.001	0.000	0.010	0.000	0.000	0.018	0.001	0.000
	gdp	0.065	0.073	0.000	0.031	0.035	0.161	0.003	0.001	0.000	0.016	0.001	0.000	0.019	0.001	0.000
1993_eq6	prod1	0.000	0.001	0.000	0.001	0.001	0.001	0.041	0.009	0.001	0.474	0.172	0.029	0.191	0.449	0.144
	prod2	0.000	0.001	0.000	0.000	0.000	0.000	0.043	0.009	0.001	0.492	0.161	0.026	0.183	0.460	0.151
	prod3	0.001	0.003	0.000	0.002	0.002	0.005	0.020	0.004	0.000	0.212	0.035	0.003	0.485	0.148	0.023
	gdp	0.011	0.011	0.000	0.005	0.004	0.020	0.009	0.002	0.000	0.128	0.016	0.001	0.260	0.049	0.005
1993_eq7	prod1	0.002	0.003	0.000	0.003	0.007	0.040	0.028	0.006	0.001	0.497	0.158	0.026	0.246	0.375	0.105
	prod2	0.000	0.001	0.000	0.002	0.005	0.014	0.055	0.012	0.001	0.344	0.272	0.061	0.147	0.482	0.188
	prod3	0.026	0.038	0.000	0.019	0.026	0.127	0.006	0.001	0.000	0.040	0.003	0.000	0.108	0.012	0.001
	gdp	0.076	0.078	0.000	0.033	0.036	0.140	0.005	0.001	0.000	0.029	0.002	0.000	0.032	0.002	0.000
Panel 5, 1994-2002																
1994_eq1	prod1	0.006	0.043	0.000	0.018	0.006	0.021	0.001	0.000	0.000	0.001	0.000	0.000	0.002	0.000	0.000
	prod2	0.001	0.019	0.000	0.010	0.002	0.009	0.002	0.000	0.000	0.005	0.000	0.000	0.005	0.000	0.000
	prod3	0.052	0.149	0.000	0.051	0.022	0.057	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	gdp	0.086	0.181	0.000	0.062	0.032	0.081	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1994_eq2	prod1	0.000	0.002	0.000	0.001	0.000	0.000	0.004	0.001	0.000	0.037	0.003	0.000	0.083	0.011	0.001
	prod2	0.000	0.001	0.000	0.001	0.000	0.000	0.007	0.001	0.000	0.067	0.008	0.001	0.193	0.038	0.004
	prod3	0.000	0.003	0.000	0.001	0.000	0.001	0.003	0.001	0.000	0.023	0.002	0.000	0.066	0.008	0.000
	gdp	0.000	0.004	0.000	0.002	0.000	0.001	0.002	0.000	0.000	0.017	0.001	0.000	0.043	0.004	0.000
1994_eq3	prod1	0.000	0.004	0.000	0.002	0.000	0.000	0.003	0.001	0.000	0.020	0.001	0.000	0.040	0.004	0.000
	prod2	0.000	0.003	0.000	0.001	0.000	0.000	0.005	0.001	0.000	0.033	0.003	0.000	0.079	0.010	0.001
	prod3	0.000	0.008	0.000	0.003	0.000	0.002	0.002	0.000	0.000	0.006	0.000	0.000	0.014	0.001	0.000
	gdp	0.000	0.010	0.000	0.004	0.001	0.002	0.001	0.000	0.000	0.005	0.000	0.000	0.010	0.001	0.000
1994_eq4	prod1	0.002	0.029	0.000	0.013	0.007	0.020	0.125	0.029	0.003	0.352	0.065	0.004	0.343	0.062	0.004
	prod2	0.000	0.008	0.000	0.005	0.001	0.005	0.172	0.044	0.005	0.480	0.140	0.015	0.443	0.162	0.019
	prod3	0.496	0.335	0.004	0.247	0.272	0.207	0.006	0.001	0.000	0.003	0.000	0.000	0.000	0.000	0.000
	gdp	0.450	0.474	0.002	0.181	0.137	0.149	0.011	0.002	0.000	0.007	0.000	0.000	0.003	0.000	0.000
1994_eq5	prod1	0.004	0.036	0.000	0.016	0.005	0.018	0.010	0.002	0.000	0.027	0.002	0.000	0.031	0.002	0.000
	prod2	0.000	0.015	0.000	0.008	0.002	0.007	0.018	0.003	0.000	0.069	0.006	0.000	0.085	0.008	0.000
	prod3	0.051	0.148	0.000	0.051	0.023	0.057	0.001	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000
	gdp	0.080	0.175	0.000	0.061	0.032	0.079	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1994_eq6	prod1	0.000	0.002	0.000	0.001	0.000	0.000	0.032	0.007	0.001	0.229	0.040	0.003	0.374	0.091	0.011
	prod2	0.000	0.001	0.000	0.001	0.000	0.000	0.045	0.010	0.001	0.312	0.066	0.007	0.444	0.192	0.035
	prod3	0.000	0.008	0.000	0.003	0.000	0.002	0.014	0.003	0.000	0.072	0.007	0.000	0.127	0.015	0.001
	gdp	0.000	0.008	0.000	0.004	0.001	0.002	0.011	0.002	0.000	0.067	0.006	0.000	0.113	0.013	0.001
1994_eq7	prod1	0.013	0.041	0.000	0.019	0.007	0.029	0.006	0.001	0.000	0.033	0.002	0.000	0.041	0.003	0.000
	prod2	0.002	0.020	0.000	0.011	0.003	0.014	0.014	0.002	0.000	0.081	0.008	0.000	0.095	0.010	0.001
	prod3	0.055	0.129	0.000	0.046	0.020	0.061	0.001	0.000	0.000	0.001	0.000	0.000	0.001	0.000	0.000
	gdp	0.087	0.178	0.000	0.063	0.033	0.083	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Note: DF_ϱ, $DF_{t\varrho}$, DF_ϱ *, $DF_{t\varrho}$ * and ADF are the test statistics of Kao (1999). Lags are in parentheses for the ADF test.. p5, p6 and p7 denote respectively the Group rho-Statistics, the Group PP-Statistics (non-parametric) and the Group ADF-Statistics (parametric) proposed by Pedroni (1999)

Table 7b Panel cointegration tests, Panel 8 and 9 (p-values)

		DF_ϱ	$DF_{t\varrho}$	DF_ϱ*	$DF_{t\varrho}$*	adf(1)	adf(4)	p5_n	p5_c	p5_t	p6_n	p6_c	p6_t	p7_n	p7_c	p7_t
Panel 8, 1994-2002																
1994_eq1	Prod3	0.043	0.129	0.000	0.028	0.018	0.007	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	Gdp	0.053	0.151	0.000	0.032	0.012	0.007	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1994_eq2	Prod3	0.000	0.004	0.000	0.002	0.000	0.001	0.000	0.000	0.000	0.001	0.000	0.000	0.037	0.002	0.000
	Gdp	0.000	0.003	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.001	0.000	0.000	0.034	0.001	0.000
1994_eq3	Prod3	0.000	0.001	0.000	0.001	0.001	0.001	0.000	0.000	0.000	0.001	0.000	0.000	0.122	0.010	0.000
	Gdp	0.000	0.006	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.033	0.001	0.000
1994_eq4	Prod3	0.059	0.167	0.000	0.036	0.012	0.050	0.008	0.001	0.000	0.012	0.000	0.000	0.024	0.000	0.000
	Gdp	0.085	0.148	0.000	0.032	0.001	0.041	0.002	0.000	0.000	0.002	0.000	0.000	0.018	0.000	0.000
1994_eq5	Prod3	0.040	0.135	0.000	0.030	0.010	0.007	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	Gdp	0.045	0.144	0.000	0.031	0.007	0.008	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1994_eq6	Prod3	0.000	0.001	0.000	0.001	0.000	0.002	0.003	0.000	0.000	0.057	0.002	0.000	0.177	0.366	0.063
	Gdp	0.000	0.002	0.000	0.001	0.000	0.001	0.001	0.000	0.000	0.038	0.001	0.000	0.326	0.205	0.022
1994_eq7	Prod3	0.005	0.024	0.000	0.008	0.011	0.004	0.001	0.000	0.000	0.004	0.000	0.000	0.040	0.001	0.000
	Gdp	0.014	0.059	0.000	0.014	0.004	0.003	0.000	0.000	0.000	0.001	0.000	0.000	0.005	0.000	0.000
Panel 8, 1995-2002																
1995_eq1	Prod1	0.038	0.072	0.000	0.016	0.002	0.020	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	Prod3	0.036	0.073	0.000	0.016	0.003	0.039	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	Gdp	0.033	0.069	0.000	0.015	0.002	0.037	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1995_eq2	Prod1	0.000	0.011	0.000	0.003	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000
	Prod3	0.001	0.012	0.000	0.003	0.000	0.005	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000
	Gdp	0.001	0.012	0.000	0.003	0.000	0.005	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000
1995_eq3	Prod1	0.001	0.009	0.000	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.009	0.000	0.000
	Prod3	0.001	0.009	0.000	0.003	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.005	0.000	0.000
	Gdp	0.001	0.009	0.000	0.002	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.020	0.001	0.000
1995_eq4	Prod1	0.127	0.219	0.000	0.045	0.007	0.008	0.001	0.000	0.000	0.003	0.000	0.000	0.005	0.000	0.000
	Prod3	0.380	0.497	0.000	0.114	0.075	0.095	0.001	0.000	0.000	0.001	0.000	0.000	0.001	0.000	0.000
	Gdp	0.239	0.318	0.000	0.067	0.015	0.097	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1995_eq5	Prod1	0.038	0.084	0.000	0.018	0.003	0.026	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.000	0.000
	Prod3	0.035	0.080	0.000	0.017	0.003	0.039	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.000	0.000
	Gdp	0.031	0.073	0.000	0.016	0.002	0.035	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.000	0.000
1995_eq6	Prod1	0.000	0.006	0.000	0.002	0.000	0.001	0.000	0.000	0.000	0.006	0.000	0.000	0.092	0.005	0.000
	Prod3	0.000	0.006	0.000	0.002	0.000	0.001	0.001	0.000	0.000	0.008	0.000	0.000	0.125	0.008	0.000
	Gdp	0.000	0.005	0.000	0.002	0.000	0.001	0.000	0.000	0.000	0.009	0.000	0.000	0.190	0.015	0.000
1995_eq7	Prod1	0.019	0.028	0.000	0.007	0.000	0.005	0.000	0.000	0.000	0.007	0.000	0.000	0.088	0.004	0.000
	Prod3	0.022	0.032	0.000	0.008	0.001	0.006	0.000	0.000	0.000	0.004	0.000	0.000	0.039	0.001	0.000
	Gdp	0.017	0.033	0.000	0.008	0.000	0.013	0.000	0.000	0.000	0.001	0.000	0.000	0.013	0.000	0.000
Panel 9, 1995-2002																
1995_eq1	Prod1	0.024	0.059	0.000	0.011	0.001	0.014	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	Prod3	0.021	0.056	0.000	0.011	0.002	0.019	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	Gdp	0.018	0.050	0.000	0.009	0.001	0.020	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1995_eq2	Prod1	0.000	0.011	0.000	0.002	0.000	0.006	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	Prod3	0.000	0.010	0.000	0.002	0.000	0.006	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	Gdp	0.000	0.010	0.000	0.002	0.000	0.006	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1995_eq3	Prod1	0.002	0.012	0.000	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.000	0.000
	Prod3	0.002	0.012	0.000	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000
	Gdp	0.001	0.010	0.000	0.002	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.005	0.000	0.000
1995_eq4	Prod1	0.102	0.185	0.000	0.033	0.006	0.024	0.001	0.000	0.000	0.002	0.000	0.000	0.008	0.000	0.000
	Prod3	0.261	0.379	0.000	0.071	0.044	0.108	0.001	0.000	0.000	0.002	0.000	0.000	0.001	0.000	0.000
	Gdp	0.118	0.198	0.000	0.035	0.007	0.094	0.001	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000
1995_eq5	Prod1	0.020	0.060	0.000	0.011	0.002	0.022	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000
	Prod3	0.018	0.055	0.000	0.011	0.002	0.024	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.000	0.000
	Gdp	0.014	0.049	0.000	0.009	0.001	0.024	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000
1995_eq6	Prod1	0.001	0.007	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.002	0.000	0.000	0.032	0.001	0.000
	Prod3	0.001	0.008	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.003	0.000	0.000	0.049	0.001	0.000
	Gdp	0.000	0.005	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.004	0.000	0.000	0.090	0.003	0.000
1995_eq7	Prod1	0.022	0.027	0.000	0.006	0.000	0.001	0.000	0.000	0.000	0.005	0.000	0.000	0.073	0.002	0.000
	Prod3	0.025	0.032	0.000	0.007	0.000	0.001	0.000	0.000	0.000	0.002	0.000	0.000	0.020	0.000	0.000
	Gdp	0.012	0.028	0.000	0.006	0.000	0.005	0.000	0.000	0.000	0.000	0.000	0.000	0.006	0.000	0.000

Note: As for Table 7a.

In general, panel cointegration tests shown in Tables 7a and 7b provide evidence in favour of long-term relationships for the seven specifications. Estimation results based on panel OLS, FMOLS and DOLS are reported in Appendix D. The analysis of the panel estimates reveals a number of interesting points. Most importantly, productivity, whether it is PROD1,PROD2 or PROD3 is always negatively related to the real exchange rate, i.e. an increase in productivity leads

to a real appreciation. And this holds true regardless of the time period, number of included countries and the specification of the estimated equation.

It is noteworthy that none of the other variables turns out to be so stable as productivity. Although openness usually bears a positive sign, in some specifications and especially for the period 1993 to 2002, it becomes insignificant. The same applies to regulated prices and the real interest rate differential. Whereas their sign is correct, i.e. a rise in these variables is linked to a real appreciation of the exchange rate, they are often not found statistically significant at the conventional significance level of 5% or 10%. Somewhat surprisingly, an increase in foreign and public debt is systematically related to an appreciation of the real exchange rate. Albeit government debt is not significant in all cases, foreign debt seems extremely robust in that its t-statistics is very significant in almost all specifications.

Table 8 Panel OLS estimates for Equations 3 and 6

	PROD	RIR	REG	OPEN	GOV
Equation3					
Panel 5, 1993-2002, PROD2	-0.44	-0.005	-0.13	0.14	-1.24
Panel 5, 1994-2002, PROD2	-0.64	-0.006	-0.10	0.14	-1.26
Panel 8, 1994-2002, PROD3	-0.19	-0.006	-0.44	0.32	-1.27
Panel 8, 1994-2002, GDP	-0.33	-0.005	-0.41	0.34	-1.02
Panel 8, 1995-2002, GDP	-0.27	-0.009	-0.36	0.17	-1.18
Panel 9, 1995-2002, GDP	-0.33	-0.007	-0.36	0.18	-1.02
Equation6					
Panel 5, 1993-2002, PROD1	-0.34	-0.004	-0.11		-1.29
Panel 5, 1994-2002, PROD1	-0.37	-0.006	-0.14		-1.41
Panel 5, 1993-2002, PROD3	-0.32	-0.004	-0.13		-1.50
Panel 8, 1994-2002, PROD3	-0.18	-0.007	-0.35		-1.38
Panel 8, 1995-2002, PROD3	-0.15	-0.01	-0.31		-1.54
Panel 5, 1993-2002, GDP	-0.41	-0.004	-0.13		-1.01
Panel 8, 1994-2002, GDP	-0.25	-0.007	-0.34		-1.20
Panel 8, 1995-2002, GDP	-0.29	-0.01	-0.27		-1.34
Panel 9, 1995-2002, GDP	-0.35	-0.008	-0.28		-1.17

Note: PROD1 and PROD2 stand for labour productivity in industry measured by industrial production, PROD3 uses value added from national accounts. Figures in columns 2-6 are estimated coefficients of the denoted variables in the tested relationship. In all these cases, cointegration could be established.

Table 8 above shows that the size of the estimated coefficients can differ markedly across different panels and time periods. For instance, Equation 3 is validated using Panel 5 only when PROD1 and not GDP is considered. The opposite holds for the panel including eight or nine countries: here GDP or PROD3 has to approximate labour productivity to be significant for the determination of the real exchange rate. Likewise, the relationship excluding openness, i.e. according to Equation 6, was often found for panel of 5 with all alternative productivity measures, while GDP appears more often significant when Panel-8 is used. The coefficient of productivity is often lower when including GDP, and it is systematically lower when Panels 8 and 9 are tested as compared with the panel of 5 countries. This finding lends further support to the

idea that the countries do differ, and that this can imply differences in the way real exchange rate is being determined. As already mentioned when studying results of time series estimates, this need not imply complete dissimilarity in the transition or catch-up strategies adopted by different countries.

However, tests revealing a more important role for labour productivity in panel of 5 compared with panel 8 could reflect the fact that FDI entered the Baltic countries later, and investments into higher technology may have needed, on average, more preparation than in the CEEC-5. In addition, the early transition process also entailed a restructuring of the entire economy and a redirection of resources, and this will in all likelihood not have been focused on the industrial goods sector alone. The latter has required a restructuring of enterprises of heavy industry, whereas the underdeveloped service sector offered more immediate growth opportunities. In fact, industrial productivity started to grow faster in the Baltic countries than in the reference country only in the second half of the 1990s, after the substantial restructuring of the industrial sector. The significance of overall GDP instead of labour productivity in industry could thus indicate that on average for all eight (or nine) countries, the shift in the composition of GDP (as regards the share of industry and services in value added) may have been even more pronounced than the shift to higher technological contents of the industrial produce.

Turning to Equation 4, the long-term relationship including labour productivity, real interest rates and foreign debt is found only for panel 5 and when using labour productivity in industry (PROD1,PROD2). It is the only relationship where foreign debt appears significant. However, an increase in foreign debt leads to real appreciation, which may indicate that foreign debt has two effects, of which only the first has influenced systematically the real exchange rate. When flowing in it appreciates the real exchange rate, whereas the increasing debt produces pressure on depreciation through income payments. That foreign debt appears significant as a determinant of real appreciation along with the real interest rate differential suggests that the real interest rate differential does not fully reflect why capital is flowing into the accession countries. Table 9 presents estimation results for equation 4. They are rather similar, and this is not surprising given that the included labour productivity series should be the same in principle. However, the comparison of different time periods shows that the coefficients for labour productivity is higher for the period of 1994-2002. The estimated coefficient of the real interest rate appears also to be slightly higher for the period from 1994 to 2002, whereas that of foreign debt declines. This might indicate that financial markets have steadily become more efficient.

Table 9 Panel estimates for Equation 4

	PROD	RIR	FDEBT
Panel 5, PROD1 1993-2002	-0.79	-0.006	-0.19
Panel 5, PROD2 1993-2002	-0.83	-0.005	-0.15
Panel 5, PROD1 1994-2002	-0.89	-0.006	-0.18
Panel 5, PROD2 1994-2002	-0.92	-0.006	-0.12

Note: as for Table 8.

VII. Calculating the Equilibrium Exchange Rate

The statistical approach adopted in this paper corresponds to the concept of the Behavioural Equilibrium Exchange Rate (BEER). After having estimated the statistical relationship between the real exchange rate and the fundamentals, we proceed to determining actual and subsequently total misalignment. In doing so, short- and medium-term variables in the estimated equations are set to zero and actual values of long-term fundamentals are substituted into the estimated relationship. Actual misalignment is given as the difference between the fitted and the actual value of the real exchange rate.

The computation of total misalignment necessitates long-run or sustainable values of the fundamentals. In this paper, long-term value of the fundamentals is derived by means of the Hodrick-Prescott filter. So, total misalignment is given as the difference between the fitted and the actual value of the real exchange with long-term values being substituted into the estimated equation. Finally, the equilibrium nominal exchange rate is obtained when the observed nominal exchange rate is adjusted for total misalignment (nominal equilibrium exchange rate = observed nominal exchange rate - misalignment).

We now follow the above-presented steps of deriving total misalignment and equilibrium nominal exchange rates against the euro in 2002. For this purpose, the estimated time series equations presented earlier are employed for the Czech Republic, Hungary and Poland. Given that the most relevant fundamentals turn out to be insignificant in equations estimated for the cases of Slovakia and Slovenia, these equations do not seem to be appropriate for deriving misalignment of the real exchange rate. In addition to the time series equations, panel equations are also employed to derive total misalignment. Table 5 hereafter provides with an overview of the results.

When calculating actual and total misalignment, the following variables are deemed as long-term determinants of the real exchange rate: (a) labour productivity, (b) regulated prices, (c) openness and (d) foreign debt and government debt provided an increase in these variables yields a real depreciation of the exchange rate.

The base year/reference period during which the exchange rate was in equilibrium is chosen so that the current account be broadly balanced. The base year is 1993 for the Czech Republic and Slovenia, 1992 for Hungary and 1994 Poland and Slovakia.

Table 10a Equilibrium exchange rates based on time series estimates, Czech Republic

	Average 2002	4th quarter 2002
Nominal exchange rate	30.79	30.86
Eq_94_4 RERCPI=f(PROD3, REG, TOT, GOV)		
EG	40.0 *(+29.9%)*	39.96 *(+29.5%)*
ARDL	40.3*(+31.1%)*	40.32 *(+30.6%)*
Eq_94_8 RERCPI=f(PROD2, REG, FDEBT)		
EG	31.3 *(+1.8%)*	31.0 *(+0.4%)*
DOLS(0,1)	33.2 *(+7.8%)*	32.58 *(+5.6%)*
DOLS(1,1)	32.1 *(+4.3%)*	31.48 *(+2.0%)*
ARDL	33.3 *(+8.2%)*	32.77 *(+6.2%)*
Johansen	34.7 *(+12.7%)*	34.22 *(+10.9%)*
Eq_94_8 RERPPI=f(PROD2, REG, FDEBT)	PPI	
EG	35.0 *(+13.8%)*	34.55 *(+12.0%)*
ARDL	33.5 *(+8.9%)*	33.01 *(+7.0%)*

Table 10b Equilibrium exchange rates based on time series estimates, Hungary

	Average 2002	4th quarter 2002
Nominal exchange rate	242.6	239.2
Eq_93_4 RERCPI=f(PROD2, GOV, OPEN, FDEBT)		
EG	247.2 *(+1.9%)*	245.1 *(+2.5%)*
DOLS	250.6 *(+3.3%)*	249.0 *(+4.1%)*
Johansen	256.1 *(+5.6%)*	255.3 *(+6.7%)*
Eq_93_4 RERPPI=f(PROD2, GOV, OPEN, FDEBT)		
EG	261.2 *(+7.6%)*	254.2 *(+6.3%)*
Eq_94_5 RERCPI=f(PROD1, FDEBT, OPEN)		
EG	251.7 *(+3.7%)*	252.7 *(+5.6%)*
DOLS(1,3)	240.0 *(-1.1%)*	239.4 *(+0.1%)*
DOLS(2,3)	227.8 *(-6.1%)*	226.9 *(-5.2%)*
ARDL	236.8 *(-2.4%)*	236.7 *(-1.0%)*
Johansen	247.2 *(+1.9%)*	247.0 *(+3.3%)*
Eq_94_5 RERPPI=f(PROD1, FDEBT, OPEN)		
DOLS(1,3)	227.9 *(-6.1%)*	221.0 *(-7.6%)*
DOLS(2,3)	219.2 *(-9.7%)*	211.1 *(-11.8%)*

Table 10c Equilibrium exchange rates based on time series estimates, Poland

	Average 2002	4th quarter 2002
Nominal exchange rate	3.849	4.00
Eq_93_1 RERCPI=f(PROD1, INTCPI)		
DOLS(2,0)	3.856 *(+0.2%)*	3.767 *(-5.8%)*
DOLS(3,3)	3.539 *(-8.1%)*	3.443 *(-13.9%)*
Johansen	4.032 *(+4.7%)*	3.947 *(-1.3%)*
Eq_93_1 RERPPI=f(PROD1, INTPPI)		
EG	4.099 *(+6.5%)*	4.071 *(+1.8%)*
DOLS(0,0)	4.153 *(+7.9%)*	4.128 *(+3.2%)*
DOLS(2,3)	3.786 *(-1.7%)*	3.746 *(-6.4%)*
ARDL	4.164 *(+8.2%)*	4.139 *(+3.5%)*
Eq_93_2 RERPPI=f(PROD2, INTPPI)		
EG	4.075 *(+5.9%)*	4.052 *(+1.3%)*
DOLS	4.122 *(+7.1%)*	4.100 *(+2.5%)*
ARDL	4.165 *(+8.2%)*	4.145 *(+3.6%)*
Eq_93_3 RERCPI=f(PROD1, INTCPI)		
DOLS	3.972 *(+3.2%)*	3.893 *(-2.7%)*
ARDL	4.202 *(+9.2%)*	4.129 *(+3.2%)*
Eq_93_3 RERPPI=f(PROD1, INTPPI)		
EG	4.151 *(+7.8%)*	4.130 *(+3.2%)*
DOLS	4.243 *(+10.2%)*	4.226 *(+5.6%)*
ARDL	4.273 *(+11.0%)*	4.257 *(+6.4%)*
Eq_93_5 RERCPI=f(PROD1, INTCPI, FDEBT)		
ARDL	3.53 *(-8.3%)*	3.480 *(-13.0%)*
Johansen	3.966 *(+3.0%)*	3.921 *(-2.0%)*
Eq_93_6 RERCPI=f(PROD1, INTCPI, GOV OPEN)		
DOLS(0,1)	4.673) *(+21.4%)*	4.634 *(+15.9%)*
DOLS(1,2)	5.284 *(+37.3%)*	5.279 *(+32.0%)*
Johansen	4.977 *(+29.3%)*	4.929 *(+23.2%)*
ARDL(1,0)	4.289 *(+11.4%)*	4.254 *(+6.3%)*
ARDL(1,1)	4.749 *(+23.4%)*	4.734 *(+18.3%)*
Eq_94_1 RERCPI=f(PROD1, INTCPI, FDEBT)		
Johansen	3.556 *(-7.6%)*	3.499 *(-12.5%)*

Table 11a Equilibrium exchange rates and misalignment based on selected panel estimates[10]
2002 averages

	Czech Rep	Hungary	Poland	Slovakia	Slovenia
Nominal exchange rate	**30.79**	**242.6**	**3.849**	**42.66**	**226.2**
Equation3, P5, PROD1, 94-02	39.88 *(+29.3%)*	227.7 *(-6.1%)*	4.167 *(+8.2%)*	53.60 *(+25.6%)*	204.4 *(-9.6%)*
Equation3, P8, GDP, 95-02	41.10 *(+33.5%)*	225.3 *(-7.1%)*	3.844 *(-0.1%)*	47.21 *(+10.6%)*	154.4 *(-31.8%)*
Equation4, P5, PROD1, 94-02	36.72 *(+19.3%)*	198.4 *(-18.2%)*	3.815 *(-0.9%)*	51.38 *(+20.4%)*	214.0 *(-5.4%)*
Equation6, P8, PROD3, 95-02	40.22 *(+30.6%)*	222.5 *(-8.3%)*	3.902 *(+1.4%)*	50.59 *(+18.6%)*	168.3 *(-25.6%)*
Equation6, P8, GDP, 95-02	41.42 *(+34.5%)*	224.3 *(-7.5%)*	3.913 *(+1.7%)*	46.67 *(+9.4%)*	169.8 *(-25%)*

Note: In parentheses: over(+)/under(-)valuation of the exchange rate.

Table 11b Equilibrium exchange rates and misalignment based on selected panel estimates
4th quarter 2002

	Czech Rep	Hungary	Poland	Slovakia	Slovenia
Nominal exchange rate	**30.86**	**239.2**	**4.00**	**41.74**	**229.5**
Equation3, P5, PROD1, 94-02	39.46 *(+27.9%)*	228.0 *(-4.7%)*	4.107 *(+2.7%)*	53.60 *(+28.4%)*	206.6 *(-10.0%)*
Equation3, P8, GDP, 95-02	41.06 *(+33.0%)*	227.9 *(-4.7%)*	3.828 *(-4.3%)*	47.59 *(+14.0%)*	155.5 *(-32.2%)*
Equation4, P5, PROD1, 94-02	36.11 *(+17.0%)*	197.3 *(-17.5%)*	3.735 *(-6.6%)*	50.99 *(+22.2%)*	219.3 *(-4.5%)*
Equation6, P8, PROD3, 95-02	40.18 *(+30.2%)*	225.7 *(-5.7%)*	3.879 *(-3.0%)*	50.99 *(+22.2%)*	169.8 *(-26.0%)*
Equation6, P8, GDP, 95-02	41.29 *(+33.8%)*	226.7 *(-5.3%)*	3.893 *(-2.7%)*	46.91 *(+12.4%)*	171.3 *(-25.4%)*

Table 12a Equilibrium exchange rates and misalignment
Equation 6 RERCPI=f(PROD/GDP, REG, RIR, GOV), 2002 averages

	Czech Rep	Hungary	Poland	Slovakia	Slovenia
Nominal exchange rate	**30.79**	**242.6**	**3.849**	**42.66**	**226.2**
P5 93-02 PROD1	44.81 *(+45.5%)*	245.9 *(+1.4%)*	4.466 *(+16.0%)*	54.57 *(+27.9%)*	213.9 *(-5.4%)*
P5 93-02 PROD3	43.31 *(+40.7%)*	271.9 *(+12.1%)*	4.546 *(+18.1%)*	56.68 *(+32.9%)*	197.1 *(-12.9%)*
P5 93-02 GDP	44.81 *(+45.5%)*	261.3 *(+7.7%)*	4.439 *(+15.3%)*	48.89 *(+14.6%)*	193.5 *(-14.4%)*
P5 94-02 PROD1	43.63 *(+41.7%)*	233.4 *(-3.8%)*	4.260 *(+10.7%)*	53.35 *(+25.1%)*	205.3 *(-9.3%)*
P8 94-02 PROD3	38.82 *(+26.1%)*	210.6 *(-13.2%)*	3.689 *(-4.1%)*	49.42 *(+15.9%)*	159.1 *(-29.6%)*
P8 94-02 GDP	39.97 *(+29.8%)*	209.4 *(-13.7%)*	3.695 *(-4.0%)*	45.64 *(+7.0%)*	160.0 *(-29.3%)*
P8 95-02 PROD3	40.22 *(+30.6%)*	222.5 *(-8.3%)*	3.902 *(+1.4%)*	50.59 *(+18.6%)*	168.3 *(-25.6%)*
P8 95-02 GDP	41.42 *(+34.5%)*	224.3 *(-7.5%)*	3.913 *(+1.7%)*	46.67 *(+9.4%)*	169.8 *(-24.9%)*
P9 95-02 GDP	40.92 *(+32.9%)*	219.7 *(-9.4%)*	3.815 *(-0.9%)*	45.60 *(+6.9%)*	165.7 *(-26.7%)*

[10] Note that only OLS estimates are taken into account when deriving the equilibrium exchange rate. A natural extension of the analysis would be use also estimates based on DOLS and FMOLS as in the case of the time series analysis.

Table 12b Equilibrium exchange rates and misalignment
Equation 6 RERCPI=f(PROD/GDP, REG, RIR, GOV), 4th quarter 2002

	Czech Rep	Hungary	Poland	Slovakia	Slovenia
Nominal exchange rate	**30.86**	**239.2**	**4.00**	**41.74**	**229.5**
P5 93-02 PROD1	44.45 *(+44.0%)*	247.7 *(+3.5%)*	4.42 *(+10.5%)*	54.75 *(+31.2%)*	216.7 *(-5.6%)*
P5 93-02 PROD3	43.21 *(+40.0%)*	275.5 *(+15.2%)*	4.51 *(+12.7%)*	57.17 *(+37.0%)*	199.2 *(-13.2%)*
P5 93-02 GDP	44.59 *(+44.5%)*	263.5 *(+10.2%)*	4.416 *(+10.4%)*	49.12 *(+17.7%)*	195.5 *(-14.8%)*
P5 94-02 PROD1	43.28 *(+40.2%)*	234.8 *(-1.8%)*	4.214 *(+5.3%)*	53.49 *(+28.2%)*	207.7 *(-9.5%)*
P8 94-02 PROD3	38.79 *(+25.7%)*	213.5 *(-10.7%)*	3.665 *(-8.4%)*	49.81 *(+19.3%)*	160.4 *(-30.1%)*
P8 94-02 GDP	39.88 *(+29.2%)*	211.8 *(-11.5%)*	3.676 *(-8.1%)*	45.88 *(+9.9%)*	161.2 *(-29.8%)*
P8 95-02 PROD3	40.18 *(+30.2%)*	225.7 *(-5.7%)*	3.879 *(-3.0%)*	50.99 *(+22.2%)*	169.8 *(-26.0%)*
P8 95-02 GDP	41.29 *(+33.8%)*	226.7 *(-5.2%)*	3.893 *(-2.7%)*	46.91 *(+12.4%)*	171.3 *(-25.4%)*
P9 95-02 GDP	40.77 *(+32.1%)*	221.8 *(-7.3%)*	3.793 *(-5.2%)*	45.80 *(+9.7%)*	167.0 *(-27.2%)*

Tables 10 to 12 show that the derived equilibrium exchange rate can vary significantly, and that differences may be the result of different time periods or panel size. However, results show a remarkable agreement with regard to the direction of a possible misalignment of the currencies: The Czech koruna as well as the Slovak koruna appear overvalued in 2002. This would be in line with a current account interpretation of the equilibrium because the Czech Republic posted a deficit of 6.5% GDP and the Slovak Republic of 9% GDP in 2002.[11] The majority of the estimates indicate that the Polish zloty was rather fairly valued in 2002; whereas in some cases, there is indication of a slight overvaluation. By contrast, the Slovene tolar seems to be undervalued according to most estimates. The case of Hungary deserves special attention. Based on time series estimates, the forint is found to be overvalued in 2002 whereas panel estimates yield strong undervaluation.

We now turn to analysing results for Slovenia and Hungary more in detail. As to Slovenia, we already mentioned that tight management of the exchange rate makes it difficult to establish anything else but tracking what the central bank was doing during the period under study. Time series estimates do not contain fundamentals such as GDP, productivity or openness. But these

[11] However, the overvaluation of the Czech koruna might be lower than what Tables 10-12 suggest. The Czech overvaluation appears dramatic, amounting to up to 50% according to some estimates. But, there seems to be a systematic underestimation of Czech real output growth in the statistics (cf. Lommatzsch/Tober 2003). An indication of the fact that the overvaluation may be exaggerated by the tests is the fact that the Slovak overvaluation is assessed as less severe despite the higher current account deficits recorded in the previous years. Furthermore, in contrast with the other countries, the estimates of the equilibrium exchange rate for the Czech koruna are often higher when calculated for GDP instead of labour productivity in industry.

variables are included into panel estimations and these suggest that developments in fundamentals may have allowed a stronger real appreciation of the tolar. However, average coefficients based on panels including up to nine counties may give only a rough indication regarding the size of over- or undervaluation. On the other hand, it should also be kept in mind that of the 5 acceding countries studied here, Slovenia is the one with the highest level of GDP expressed in PPP terms. Hence, catch-up in technology and preferences towards domestic goods may be less pronounced than in the other countries. Consequently, the room for real appreciation of the industrial goods prices deflated real exchange rate may be lower.

As to Hungary, the extent of a possible misalignment derived from time series estimates contrasts sharply with that obtained based on panel estimates. Whereas in the first case, the forint appears to be overvalued in 2002, the latter indicates strong undervaluation and this is a very questionable outcome. Findings based on panel estimates may be subject to the fact that panel estimates are average figures for the panel as a whole and both the selection of significant variables and the size of the estimated coefficients may disregards country-specific features. More specifically, foreign debt, which has long influenced Hungary's external balance and exchange rate policy of the Central bank, is an important determinant of long-term exchange rate developments in Hungary and an increase in foreign debt is found to lead to real depreciation. Nevertheless, foreign debt enters, if at all, panel equations systematically with the opposite sign. This might capture more capital inflows than accruing income payments to foreigners. Also, in the other countries, foreign debt started growing only after the beginning of transition. Income payments for these investments became therefore significant only in the late 1990s. If foreign debt is signed incorrectly or is not included in the specification, the sizeable undervaluation of the forint may reflect more that Hungary recorded even surpluses in its trade balance in a number of years in the past decade, with the entire deficit in the current account stemming from income payments.

More generally, systematic differences also appear to be the case as to whether 5, 8 or 9 countries are used for the panel investigation. The derived equilibrium exchange rates are for all five countries lower (more overvaluued) when the larger panel is used where GDP is included instead of labour productivity that turned out to be insignificant on a number of occasions. The Baltic countries have achieved macroeconomic balance and started to record higher growth later than the CEEC-5; corrections from earlier stabilisation policies may have taken more time. This is why the average values for the panel of 8 or 9 countries may be influenced by the uneven pace of reforms among the countries.

Also a comparison between the results obtained from Equation 3 and Equation 6 yileds systematic differences are possible. . The inclusion of an additional variables, such as open, or a

simply change in the period under study and the number of countries included into the panel can result in notable differences.

IX. Conclusion

In this paper, some new light is provided with regard to the appreciation of the CPI-based real exchange rate in acceding countries. Different measures of labour productivity are found to impact on the real exchange rate. Contrary to the general finding of the literature, we argue that the productivity-driven service price channel is only part of the story. Instead, labour productivity mainly affects the real exchange rate via the industrial good price channel. This is evidenced by the appreciation of the PPI-based real exchange rate that followed closely that of the CPI-deflated real exchange rate.

The paper attempted to provide a systematic methodological assessment of the equilibrium exchange rate. However, a huge amount of work remains yet to be done. A number of time series and panel estimates suggests that real exchange rate determination may be differing across the five most developed CEE acceding countries. These differences are also reflected in the average coefficients of the panel estimates. Therefore, larger panels needs to be used that reflect more long-term average relationships instead of country-specific phenomena. In the future, the panel is to be extended to up to 30 countries, all being small and open economies. With regard to panel estimates, the OLS, DOLS and FMOLS estimates should be completed with estimates based on the PMGE. Another point to extend is how the long-term values of the fundamentals are calculated. It appears useful to implement other techniques than the Hodrick-Prescott filter, e.g. the Beveridge-Nelson decomposition and the Gonzalo-Granger approach aimed at decomposing the estimated long-term relationship into permanent and transitory components.

References:

Balassa, Béla, 1964, The purchasing-power parity doctrine: a reappraisal. Journal of Political Economy 72, pp. 584-596.

Beblavy, Miroslav, 2002, Exchange Rate and Exchange Rate Regime in Slovakia, Recent Developments, International Center for Economic Growth, European Center, Working Paper No. 5, Budapest

Benacek, Vladimir, Prokop, Ladislav and Visek, Jan A., 2003, Determining factors of the Czech foreign trade balance: Structural issues in trade creation, Czech National Bank Working Paper No. 3., June.

Caprirolo, Gonzalo and Lavrac Vladimir, 2003, Monetary and exchange rate policies in Slovenia, Ezoneplus Working paper No. 17G

Campos, Nauro and Coricelli, Fabio, 2002, Growth in Transition: What we know, what we don't and what we should, Journal of Economic Literature, 11, pp. 793-836

Darvas, Zsolt and Sass, Magdolna, 2002, Changes in Hungarian Foreign Trade and Trade Balance with the European Union In Pavlos Karadeloglou, Ed., *Enlarging the EU: The Trade Balance Effect*, pp. 51-88. Hampshire, England : Palgrave Macmillan Publisher, 2002.

Égert, Balázs, 2002, Investigating the Balassa-Samuelson Hypothesis in the Transition: Do We Understand What We See? A Panel Study, Economics of Transition, 10(2), pp. 273-309

Égert, Balázs, 2003a, Assessing equilibrium exchange rates in CEE acceding countries: Can we have DEER with BEER without FEER? A critical survey of the literature, forthcoming in Focus on Transition (Oesterreichische Nationalbank), No. 2.

Égert, Balázs, 2003b, Nominal and real convergence in Estonia: The Balassa-Samuelson (dis)connection – Tradable goods, regulated prices and other culprits, Bank of Estonia Working Paper No 5.

Égert, Balázs, Drine, Imed, Lommatzsch, Kirsten and Rault, Christophe, 2003, The Balassa-Samuelson effect in Central and Eastern Europe: Myth or Reality? Journal of Comparative Economics, 31(3), pp. 552-572.

Im, Kyung So, Pesaran, M. Hashem and Shin, Yongcheol, 2003, Testing for unit roots in heterogeneous panels, Journal of Econometrics, 115m pp. 53-74.

Kao, Chihwa, 1999, Spurious regression and residual-based tests for cointegration in panel data, Journal of Econometrics, 90, pp. 1-44.

Kao, Chihwa and Chiang, Min-Hsien, 2000, On the estimation and inference of a cointegrated regression in panel data, Advances in Econometrics, 15: Nonstationary panels, panel cointegration and dynamic panels, pp. 179-222.

Lommatzsch, Kirsten and Tober, Silke, 2003, What is behind the real appreciation of accession countries' currencies? An investigation of the PPI-deflated real exchange rate. Forthcoming in: Vierteljahreshefte des DIW Berlin.

Montiel, Peter J., 1999 The Long-Run Equilibrium Real Exchange Rate: Conceptual Issues and Empirical Research, In: Hinkle, Lawrence E., Montiel Peter J., Exchange Rate Misalignment, Concepts and measurement for developing countries; Oxford University Press, 1999; pp.219 - 263

Pedroni, Peter, 1999, Critical Values for Cointegration Tests in Heterogeneous Panels with Multiple Regressors. Oxford Bulletin of Economics and Statistics, Vol. 61, Supplement 1, pp. 653-670, Nov. 1999.

Pesaran, M. Hashem, Shin, Yongcheol and Smith, Richard J., 2001, Bounds testing approaches to the analysis of the level relationships, Journal of Applied Econometrics, 16, pp. 289-326.

Rosati, Dariusz, 1996, Exchange rate policies during transition from plan to market, In: Economics of Transition, Volume 4(1), pp- 159-186

Samuelson, Paul A., 1964, Theoretical notes on trade problems. Review of Economics and Statistics 46, pp. 145-154.

Sgard, Jerome, 2001, Direct foreign investments and productivity growth in Hungarian firms, 1992-1999, CEPII Working Paper No. 19, December.

Stein, Jerome L. ,1994, The natural real exchange rate of the US dollar and determinants of capital flows, In: Williamson, John (ed.) 1994, Estimating equilibrium exchange rates, Institute for International Economics, Washington D.C., pp. 133-176.

Stein, Jerome L., 1995, The Fundamental Determinants of the Real Exchange Rate of the U.S: Dollar Relative to Other G-7 Countries, IMF Working Paper WP/95/81

Stein, Jerome L. and Lim, Guay C., 2002, Introduction to "Exchange rates in Europe and Australasia: Fundamental determinant, adjustments and policy implications", Australian Economic Papers, pp. 329-341

Stock, James and Watson, Mark W.,1993, A simple estimator of cointegrating vectors in higher order integrated systems, Econometrica, 61(4), 783-820.

APPENDIX A. Unit Root Tests – Time Series

Czech Republic (p-values)

RERCPI

	lag	ADF-trend	ADF-const	ADF-none	PP-trend	PP-const	PP-none
in levels	0	0.321	0.936	0.997	0.321	0.936	0.997
	1	0.119	0.881	0.966	0.243	0.930	0.994
	2	0.075	0.871	0.948	0.217	0.930	0.993
	3	0.393	0.947	0.987	0.251	0.938	0.995
	4	0.567	0.934	0.980	0.300	0.948	0.997
in 1st diff	0	0.003	0.000	0.000	0.003	0.000	0.000
	1	0.042	0.007	0.008	0.003	0.000	0.000
	2	0.008	0.001	0.005	0.003	0.000	0.000
	3	0.024	0.004	0.032	0.004	0.001	0.000
	4	0.107	0.023	0.137	0.005	0.001	0.000
in 2nd diff	0	0.000	0.000	0.000	0.000	0.000	0.000
	1	0.007	0.001	0.000	0.000	0.000	0.000
	2	0.007	0.001	0.000	0.000	0.000	0.000
	3	0.005	0.001	0.000	0.000	0.000	0.000
	4	0.025	0.005	0.000	0.000	0.000	0.000

RERPPI

	lag	ADF-trend	ADF-const	ADF-none	PP-trend	PP-const	PP-none
in levels	0	0.328	0.938	0.980	0.328	0.938	0.980
	1	0.097	0.881	0.925	0.246	0.929	0.972
	2	0.066	0.876	0.927	0.223	0.929	0.971
	3	0.325	0.943	0.978	0.254	0.941	0.980
	4	0.626	0.961	0.988	0.312	0.956	0.989
in 1st diff	0	0.003	0.000	0.000	0.003	0.000	0.000
	1	0.031	0.005	0.002	0.003	0.000	0.000
	2	0.009	0.001	0.002	0.003	0.000	0.000
	3	0.011	0.002	0.007	0.005	0.001	0.000
	4	0.072	0.015	0.061	0.005	0.001	0.000
in 2nd diff	0	0.000	0.000	0.000	0.000	0.000	0.000
	1	0.005	0.001	0.000	0.000	0.000	0.000
	2	0.011	0.002	0.000	0.000	0.000	0.000
	3	0.005	0.001	0.000	0.000	0.000	0.000
	4	0.019	0.003	0.000	0.000	0.000	0.000

PROD

	lag	ADF-trend	ADF-const	ADF-none	PP-trend	PP-const	PP-none
in levels	0	0.669	0.919	0.984	0.669	0.919	0.984
	1	0.792	0.948	0.987	0.674	0.932	0.989
	2	0.832	0.946	0.987	0.672	0.942	0.993
	3	0.354	0.820	0.954	0.615	0.938	0.991
	4	0.888	0.989	0.983	0.608	0.942	0.993
in 1st diff	0	0.000	0.000	0.000	0.000	0.000	0.000
	1	0.006	0.001	0.001	0.000	0.000	0.000
	2	0.159	0.044	0.034	0.000	0.000	0.000
	3	0.123	0.044	0.020	0.000	0.000	0.000
	4	0.049	0.016	0.019	0.000	0.000	0.000
in 2nd diff	0	0.000	0.000	0.000	0.000	0.000	0.000
	1	0.000	0.000	0.000	0.000	0.000	0.000
	2	0.002	0.000	0.000	0.000	0.000	0.000
	3	0.068	0.018	0.001	0.000	0.000	0.000
	4	0.007	0.002	0.000	0.000	0.000	0.000

OPEN

	lag	ADF-trend	ADF-const	ADF-none	PP-trend	PP-const	PP-none
in levels	0	0.744	0.361	0.794	0.744	0.361	0.794
	1	0.393	0.564	0.696	0.603	0.359	0.752
	2	0.324	0.474	0.707	0.540	0.355	0.736
	3	0.027	0.424	0.606	0.480	0.350	0.717
	4	0.145	0.604	0.766	0.476	0.349	0.715
in 1st diff	0	0.006	0.001	0.000	0.006	0.001	0.000
	1	0.049	0.013	0.001	0.006	0.001	0.000
	2	0.372	0.154	0.020	0.006	0.001	0.000
	3	0.138	0.042	0.005	0.005	0.001	0.000
	4	0.068	0.016	0.002	0.006	0.001	0.000
in 2nd diff	0	0.000	0.000	0.000	0.000	0.000	0.000
	1	0.000	0.000	0.000	0.000	0.000	0.000
	2	0.054	0.012	0.001	0.000	0.000	0.000
	3	0.164	0.044	0.003	0.000	0.000	0.000
	4	0.099	0.024	0.001	0.000	0.000	0.000

GDP

	lag	ADF-trend	ADF-const	ADF-none	PP-trend	PP-const	PP-none
in levels	0	0.410	0.089	0.999	0.410	0.089	0.999
	1	0.080	0.587	0.757	0.469	0.207	0.993
	2	0.056	0.698	0.786	0.456	0.269	0.982
	3	0.148	0.891	0.875	0.431	0.301	0.969
	4	0.258	0.878	0.913	0.406	0.318	0.959
in 1st diff	0	0.746	0.372	0.092	0.746	0.372	0.092
	1	0.741	0.349	0.078	0.745	0.371	0.093
	2	0.540	0.164	0.026	0.738	0.364	0.092
	3	0.453	0.150	0.040	0.712	0.341	0.088
	4	0.697	0.324	0.079	0.732	0.356	0.092
in 2nd diff	0	0.000	0.000	0.000	0.000	0.000	0.000
	1	0.013	0.004	0.000	0.000	0.000	0.000
	2	0.256	0.110	0.012	0.000	0.000	0.000
	3	0.103	0.040	0.003	0.000	0.000	0.000
	4	0.321	0.157	0.018	0.000	0.000	0.000

REG_DIFF

	lag	ADF-trend	ADF-const	ADF-none	PP-trend	PP-const	PP-none
in levels	0	0.898	0.821	0.997	0.898	0.821	0.997
	1	0.980	0.783	0.995	0.942	0.814	0.997
	2	0.915	0.608	0.807	0.881	0.820	0.992
	3	0.969	0.544	0.809	0.880	0.819	0.989
	4	0.915	0.239	0.545	0.819	0.822	0.981
in 1st diff	0	0.000	0.000	0.000	0.000	0.000	0.000
	1	0.231	0.096	0.100	0.000	0.000	0.000
	2	0.168	0.074	0.125	0.000	0.000	0.000
	3	0.479	0.360	0.334	0.000	0.000	0.000
	4	0.525	0.451	0.350	0.000	0.000	0.000
in 2nd diff	0	0.000	0.000	0.000	0.000	0.000	0.000
	1	0.000	0.000	0.000	0.000	0.000	0.000
	2	0.000	0.000	0.000	0.000	0.000	0.000
	3	0.011	0.005	0.000	0.000	0.000	0.000
	4	0.136	0.055	0.004	0.000	0.000	0.000

FDEBT I(1)

	lag	ADF-trend	ADF-const	ADF-none	PP-trend	PP-const	PP-none
in levels	0	0.999	0.046	0.835	0.999	0.046	0.835
	1	0.950	0.015	0.618	0.998	0.096	0.775
	2	0.918	0.112	0.476	0.997	0.134	0.735
	3	0.988	0.424	0.547	0.997	0.155	0.710
	4	0.991	0.260	0.561	0.998	0.168	0.691
in 1st diff	0	0.000	0.062	0.010	0.000	0.062	0.010
	1	0.102	0.475	0.093	0.000	0.070	0.013
	2	0.096	0.283	0.030	0.000	0.048	0.008
	3	0.030	0.404	0.064	0.000	0.043	0.008
	4	0.106	0.834	0.282	0.000	0.040	0.007
in 2nd diff	0	0.000	0.000	0.000	0.000	0.000	0.000
	1	0.004	0.000	0.000	0.000	0.000	0.000
	2	0.058	0.012	0.001	0.000	0.000	0.000
	3	0.003	0.001	0.000	0.000	0.000	0.000
	4	0.138	0.030	0.004	0.000	0.000	0.000

INT_CPI

	lag	ADF-trend	ADF-const	ADF-none	PP-trend	PP-const	PP-none
in levels	0	0.707	0.319	0.032	0.707	0.319	0.032
	1	0.690	0.267	0.023	0.719	0.326	0.032
	2	0.389	0.092	0.005	0.697	0.316	0.031
	3	0.185	0.030	0.001	0.687	0.313	0.031
	4	0.263	0.082	0.006	0.675	0.307	0.030
in 1st diff	0	0.000	0.000	0.000	0.000	0.000	0.000
	1	0.041	0.014	0.001	0.000	0.000	0.000
	2	0.160	0.080	0.011	0.000	0.000	0.000
	3	0.540	0.239	0.038	0.000	0.000	0.000
	4	0.163	0.076	0.009	0.000	0.000	0.000
in 2nd diff	0	0.000	0.000	0.000	0.000	0.000	0.000
	1	0.000	0.000	0.000	0.000	0.000	0.000
	2	0.001	0.000	0.000	0.000	0.000	0.000
	3	0.139	0.040	0.003	0.000	0.000	0.000
	4	0.146	0.045	0.003	0.000	0.000	0.000

INT_PPI

	lag	ADF-trend	ADF-const	ADF-none	PP-trend	PP-const	PP-none
in levels	0	0.673	0.240	0.092	0.673	0.240	0.092
	1	0.660	0.220	0.102	0.689	0.243	0.093
	2	0.622	0.226	0.107	0.680	0.238	0.087
	3	0.704	0.318	0.149	0.679	0.235	0.083
	4	0.507	0.186	0.089	0.664	0.227	0.075
in 1st diff	0	0.000	0.000	0.000	0.000	0.000	0.000
	1	0.035	0.011	0.001	0.000	0.000	0.000
	2	0.139	0.046	0.004	0.000	0.000	0.000
	3	0.495	0.246	0.035	0.000	0.000	0.000
	4	0.296	0.134	0.016	0.000	0.000	0.000
in 2nd diff	0	0.000	0.000	0.000	0.000	0.000	0.000
	1	0.000	0.000	0.000	0.000	0.000	0.000
	2	0.000	0.000	0.000	0.000	0.000	0.000
	3	0.092	0.022	0.001	0.000	0.000	0.000
	4	0.047	0.010	0.000	0.000	0.000	0.000
	5	0.080	0.018	0.001	0.000	0.000	0.000
	6	0.189	0.056	0.004	0.000	0.000	0.000

TOT

	lag	ADF-trend	ADF-const	ADF-none	PP-trend	PP-const	PP-none
in levels	0	0.852	0.536	0.407	0.852	0.536	0.407
	1	0.396	0.161	0.123	0.752	0.412	0.299
	2	0.170	0.043	0.099	0.672	0.338	0.242
	3	0.023	0.005	0.040	0.601	0.282	0.201
	4	0.583	0.252	0.371	0.578	0.265	0.188
in 1st diff	0	0.098	0.024	0.002	0.098	0.024	0.002
	1	0.273	0.099	0.010	0.096	0.024	0.002
	2	0.636	0.316	0.049	0.104	0.026	0.002
	3	0.036	0.008	0.000	0.074	0.018	0.001
	4	0.097	0.022	0.001	0.074	0.018	0.001
in 2nd diff	0	0.000	0.000	0.000	0.000	0.000	0.000
	1	0.000	0.000	0.000	0.000	0.000	0.000
	2	0.416	0.162	0.018	0.000	0.000	0.000
	3	0.210	0.067	0.006	0.000	0.000	0.000
	4	0.068	0.017	0.001	0.000	0.000	0.000
	5	0.297	0.099	0.009	0.000	0.000	0.000
	6	0.279	0.082	0.007	0.000	0.000	0.000

GOV

	lag	ADF-trend	ADF-const	ADF-none	PP-trend	PP-const	PP-none
in levels	0	5E-01	1E+00	1E+00	5E-01	1E+00	1E+00
	1	2E-01	1E+00	1E+00	5E-01	1E+00	1E+00
	2	8E-01	1E+00	1E+00	4E-01	1E+00	1E+00
	3	6E-01	1E+00	1E+00	5E-01	1E+00	1E+00
	4	6E-01	1E+00	9E-01	4E-01	1E+00	1E+00
in 1st diff	0	2E-08	2E-06	6E-07	2E-08	2E-06	6E-07
	1	2E-05	8E-05	1E-03	1E-08	2E-06	6E-07
	2	4E-02	1E-01	1E-01	2E-09	2E-06	6E-07
	3	6E-02	2E-01	2E-01	3E-10	2E-06	4E-07
	4	6E-02	2E-01	3E-01	3E-11	2E-06	3E-07
in 2nd diff	0	1E-35	8E-09	2E-55	1E-35	8E-09	2E-55
	1	2E-09	3E-08	3E-16	2E-50	2E-08	6E-58
	2	5E-04	7E-05	1E-06	6E-58	5E-06	6E-58
	3	6E-03	1E-03	5E-05	6E-58	1E-04	6E-58
	4	7E-03	2E-03	1E-04	6E-58	1E-04	6E-58

Hungary (p-values)

RERCPI

	lag	ADF-trend	ADF-const	ADF-none	PP-trend	PP-const	PP-none
in levels	0	0.950	0.994	0.997	0.950	0.994	0.997
	1	0.918	0.993	0.991	0.939	0.993	0.997
	2	0.944	0.986	0.988	0.935	0.993	0.997
	3	0.668	0.990	0.958	0.919	0.992	0.996
	4	0.728	0.996	0.979	0.913	0.991	0.996
in 1st diff	0	0.000	0.000	0.000	0.000	0.000	0.000
	1	0.006	0.002	0.001	0.000	0.000	0.000
	2	0.112	0.094	0.024	0.000	0.000	0.000
	3	0.064	0.084	0.023	0.000	0.000	0.000
	4	0.247	0.258	0.100	0.000	0.000	0.000
in 2nd diff	0	0.000	0.000	0.000	0.000	0.000	0.000
	1	0.000	0.000	0.000	0.000	0.000	0.000
	2	0.001	0.000	0.000	0.000	0.000	0.000
	3	0.003	0.000	0.000	0.000	0.000	0.000
	4	0.078	0.020	0.001	0.000	0.000	0.000

RERPPI

	Lag	ADF-trend	ADF-const	ADF-none	PP-trend	PP-const	PP-none
in levels	0	0.740	0.917	0.864	0.740	0.917	0.864
	1	0.610	0.886	0.792	0.694	0.902	0.838
	2	0.618	0.819	0.741	0.659	0.891	0.820
	3	0.081	0.771	0.558	0.606	0.871	0.788
	4	0.013	0.819	0.594	0.578	0.858	0.769
in 1st diff	0	0.000	0.000	0.000	0.000	0.000	0.000
	1	0.020	0.004	0.000	0.000	0.000	0.000
	2	0.243	0.109	0.013	0.000	0.000	0.000
	3	0.224	0.121	0.014	0.000	0.000	0.000
	4	0.384	0.184	0.031	0.000	0.000	0.000
in 2nd diff	0	0.000	0.000	0.000	0.000	0.000	0.000
	1	0.000	0.000	0.000	0.000	0.000	0.000
	2	0.000	0.000	0.000	0.000	0.000	0.000
	3	0.018	0.003	0.000	0.000	0.000	0.000
	4	0.202	0.054	0.004	0.000	0.000	0.000

PROD

	lag	ADF-trend	ADF-const	ADF-none	PP-trend	PP-const	PP-none
in levels	0	0.028	0.377	1.000	0.028	0.377	1.000
	1	0.133	0.246	1.000	0.029	0.225	1.000
	2	0.009	0.563	0.971	0.029	0.291	1.000
	3	0.247	0.909	0.996	0.029	0.286	0.999
	4	0.205	0.756	0.991	0.029	0.270	0.999
in 1st diff	0	0.000	0.000	0.000	0.000	0.000	0.000
	1	0.043	0.014	0.053	0.000	0.000	0.000
	2	0.018	0.001	0.007	0.000	0.000	0.000
	3	0.018	0.004	0.086	0.000	0.000	0.000
	4	0.049	0.005	0.052	0.000	0.000	0.000
in 2nd diff	0	0.000	0.000	0.000	0.000	0.000	0.000
	1	0.000	0.000	0.000	0.000	0.000	0.000
	2	0.033	0.008	0.000	0.000	0.000	0.000
	3	0.001	0.000	0.000	0.000	0.000	0.000
	4	0.027	0.007	0.000	0.000	0.000	0.000

OPEN ???I(2)

	Lag	ADF-trend	ADF-const	ADF-none	PP-trend	PP-const	PP-none
in levels	0	0.988	0.812	0.803	0.988	0.812	0.803
	1	0.967	0.659	0.595	0.962	0.801	0.749
	2	0.988	0.510	0.547	0.934	0.792	0.717
	3	0.998	0.263	0.477	0.906	0.785	0.693
	4	0.985	0.322	0.334	0.874	0.778	0.672
in 1st diff	0	0.017	0.004	0.000	0.017	0.004	0.000
	1	0.072	0.027	0.004	0.020	0.005	0.000
	2	0.083	0.054	0.012	0.024	0.005	0.000
	3	0.528	0.426	0.106	0.025	0.005	0.000
	4	0.789	0.646	0.168	0.021	0.004	0.000
in 2nd diff	0	0.000	0.000	0.000	0.000	0.000	0.000
	1	0.000	0.000	0.000	0.000	0.000	0.000
	2	0.000	0.000	0.000	0.000	0.000	0.000
	3	0.003	0.001	0.000	0.000	0.000	0.000
	4	0.014	0.011	0.001	0.000	0.000	0.000

GDP

	lag	ADF-trend	ADF-const	ADF-none	PP-trend	PP-const	PP-none
in levels	0	0.014	1.000	1.000	0.014	1.000	1.000
	1	0.167	0.997	0.991	0.028	1.000	1.000
	2	0.284	0.983	0.919	0.041	1.000	1.000
	3	0.182	0.990	0.924	0.044	1.000	1.000
	4	0.747	0.986	0.884	0.045	1.000	1.000
in 1st diff	0	0.007	0.004	0.051	0.007	0.004	0.051
	1	0.183	0.056	0.254	0.008	0.005	0.098
	2	0.170	0.074	0.280	0.007	0.004	0.085
	3	0.065	0.007	0.359	0.007	0.005	0.098
	4	0.304	0.052	0.505	0.008	0.005	0.093
in 2nd diff	0	0.000	0.000	0.000	0.000	0.000	0.000
	1	0.000	0.000	0.000	0.000	0.000	0.000
	2	0.000	0.000	0.000	0.000	0.000	0.000
	3	0.002	0.001	0.000	0.000	0.000	0.000
	4	0.120	0.033	0.002	0.000	0.000	0.000

REG_DIFF

	lag	ADF-trend	ADF-const	ADF-none	PP-trend	PP-const	PP-none
in levels	0	0.998	0.262	1.000	0.998	0.262	1.000
	1	0.993	0.372	0.973	0.996	0.308	0.998
	2	1.000	0.121	0.977	0.998	0.256	0.997
	3	0.999	0.119	0.839	0.999	0.229	0.995
	4	0.982	0.283	0.537	0.998	0.281	0.991
in 1st diff	0	0.000	0.000	0.001	0.000	0.000	0.001
	1	0.000	0.000	0.005	0.000	0.000	0.001
	2	0.015	0.061	0.123	0.000	0.000	0.002
	3	0.532	0.692	0.292	0.000	0.000	0.002
	4	0.208	0.615	0.356	0.000	0.000	0.001
in 2nd diff	0	0.000	0.000	0.000	0.000	0.000	0.000
	1	0.000	0.000	0.000	0.000	0.000	0.000
	2	0.000	0.000	0.000	0.000	0.000	0.000
	3	0.001	0.000	0.000	0.000	0.000	0.000
	4	0.011	0.003	0.000	0.000	0.000	0.000

INT_CPI

	lag	ADF-trend	ADF-const	ADF-none	PP-trend	PP-const	PP-none
in levels	0	0.489	0.297	0.045	0.489	0.297	0.045
	1	0.014	0.006	0.000	0.301	0.154	0.018
	2	0.013	0.002	0.000	0.226	0.109	0.011
	3	0.000	0.000	0.000	0.202	0.097	0.010
	4	0.001	0.000	0.000	0.212	0.105	0.011
in 1st diff	0	0.026	0.005	0.000	0.026	0.005	0.000
	1	0.008	0.001	0.000	0.022	0.004	0.000
	2	0.002	0.000	0.000	0.022	0.004	0.000
	3	0.006	0.001	0.000	0.024	0.005	0.000
	4	0.003	0.001	0.000	0.029	0.006	0.000
in 2nd diff	0	0.000	0.000	0.000	0.000	0.000	0.000
	1	0.000	0.000	0.000	0.000	0.000	0.000
	2	0.016	0.003	0.000	0.000	0.000	0.000
	3	0.031	0.005	0.000	0.000	0.000	0.000
	4	0.001	0.000	0.000	0.000	0.000	0.000

INT_PPI

	lag	ADF-trend	ADF-const	ADF-none	PP-trend	PP-const	PP-none
in levels	0	0.261	0.107	0.013	0.261	0.107	0.013
	1	0.001	0.000	0.000	0.167	0.055	0.006
	2	0.076	0.021	0.009	0.131	0.038	0.004
	3	0.056	0.014	0.010	0.119	0.033	0.004
	4	0.451	0.184	0.156	0.125	0.035	0.004
in 1st diff	0	0.060	0.017	0.001	0.060	0.017	0.001
	1	0.004	0.000	0.000	0.045	0.013	0.001
	2	0.016	0.002	0.000	0.050	0.016	0.001
	3	0.000	0.000	0.000	0.055	0.018	0.001
	4	0.033	0.007	0.000	0.075	0.026	0.002
in 2nd diff	0	0.000	0.000	0.000	0.000	0.000	0.000
	1	0.000	0.000	0.000	0.000	0.000	0.000
	2	0.021	0.004	0.000	0.000	0.000	0.000
	3	0.004	0.000	0.000	0.000	0.000	0.000
	4	0.008	0.001	0.000	0.000	0.000	0.000

FDEBT

	lag	ADF-trend	ADF-const	ADF-none	PP-trend	PP-const	PP-none
in levels	0	0.839	0.712	0.305	0.839	0.712	0.305
	1	0.544	0.400	0.094	0.750	0.593	0.200
	2	0.322	0.244	0.043	0.677	0.504	0.146
	3	0.242	0.282	0.048	0.645	0.463	0.125
	4	0.159	0.240	0.040	0.628	0.436	0.114
in 1st diff	0	0.002	0.000	0.000	0.002	0.000	0.000
	1	0.060	0.018	0.001	0.002	0.000	0.000
	2	0.045	0.018	0.001	0.002	0.000	0.000
	3	0.198	0.093	0.009	0.002	0.000	0.000
	4	0.250	0.095	0.009	0.002	0.000	0.000
in 2nd diff	0	0.000	0.000	0.000	0.000	0.000	0.000
	1	0.000	0.000	0.000	0.000	0.000	0.000
	2	0.001	0.000	0.000	0.000	0.000	0.000
	3	0.012	0.002	0.000	0.000	0.000	0.000
	4	0.010	0.001	0.000	0.000	0.000	0.000

TOT

	lag	ADF-trend	ADF-const	ADF-none	PP-trend	PP-const	PP-none
in levels	0	0.008	0.001	0.258	0.008	0.001	0.258
	1	0.030	0.009	0.437	0.010	0.002	0.358
	2	0.004	0.004	0.525	0.010	0.002	0.408
	3	0.610	0.657	0.611	0.010	0.002	0.475
	4	0.498	0.441	0.509	0.010	0.002	0.431
in 1st diff	0	0.000	0.000	0.000	0.000	0.000	0.000
	1	0.000	0.000	0.000	0.000	0.000	0.000
	2	0.000	0.000	0.000	0.000	0.000	0.000
	3	0.075	0.022	0.001	0.000	0.000	0.000
	4	0.225	0.100	0.009	0.000	0.000	0.000
in 2nd diff	0	0.000	0.000	0.000	0.000	0.000	0.000
	1	0.000	0.000	0.000	0.000	0.000	0.000
	2	0.000	0.000	0.000	0.000	0.000	0.000
	3	0.000	0.000	0.000	0.000	0.000	0.000
	4	0.000	0.000	0.000	0.000	0.000	0.000

GOV I(1)

	lag	ADF-trend	ADF-const	ADF-none	PP-trend	PP-const	PP-none
in levels	0	0.023	0.003	0.994	0.023	0.003	0.994
	1	0.104	0.086	0.965	0.025	0.003	0.986
	2	0.526	0.609	0.952	0.029	0.004	0.975
	3	0.651	0.761	0.937	0.032	0.004	0.965
	4	0.490	0.854	0.880	0.037	0.006	0.953
in 1st diff	0	0.025	0.003	0.002	0.025	0.003	0.002
	1	0.513	0.052	0.018	0.041	0.006	0.005
	2	0.873	0.174	0.062	0.031	0.005	0.004
	3	0.994	0.566	0.240	0.023	0.004	0.004
	4	0.988	0.498	0.221	0.013	0.002	0.002
in 2nd diff	0	0.000	0.000	0.000	0.000	0.000	0.000
	1	0.000	0.000	0.000	0.000	0.000	0.000
	2	0.000	0.000	0.000	0.000	0.000	0.000
	3	0.058	0.065	0.004	0.000	0.000	0.000
	4	0.192	0.273	0.032	0.000	0.000	0.000

Poland (p-values)

RERCPI

	lag	ADF-trend	ADF-const	ADF-none	PP-trend	PP-const	PP-none
in levels	0	0.483	0.789	0.913	0.483	0.789	0.913
	1	0.529	0.800	0.916	0.457	0.794	0.919
	2	0.383	0.751	0.834	0.403	0.792	0.910
	3	0.242	0.555	0.649	0.356	0.788	0.897
	4	0.053	0.452	0.473	0.330	0.785	0.885
in 1st diff	0	0.000	0.000	0.000	0.000	0.000	0.000
	1	0.040	0.008	0.002	0.000	0.000	0.000
	2	0.456	0.162	0.044	0.000	0.000	0.000
	3	0.824	0.439	0.127	0.000	0.000	0.000
	4	0.891	0.542	0.178	0.000	0.000	0.000
in 2nd diff	0	0.000	0.000	0.000	0.000	0.000	0.000
	1	0.000	0.000	0.000	0.000	0.000	0.000
	2	0.000	0.000	0.000	0.000	0.000	0.000
	3	0.005	0.002	0.000	0.000	0.000	0.000
	4	0.335	0.188	0.023	0.000	0.000	0.000

RERPPI

	lag	ADF-trend	ADF-const	ADF-none	PP-trend	PP-const	PP-none
in levels	0	0.200	0.617	0.792	0.200	0.617	0.792
	1	0.521	0.682	0.861	0.212	0.644	0.838
	2	0.436	0.784	0.858	0.192	0.648	0.847
	3	0.398	0.692	0.779	0.175	0.647	0.844
	4	0.151	0.598	0.612	0.161	0.643	0.833
in 1st diff	0	0.000	0.000	0.000	0.000	0.000	0.000
	1	0.003	0.000	0.000	0.000	0.000	0.000
	2	0.152	0.041	0.007	0.000	0.000	0.000
	3	0.674	0.307	0.065	0.000	0.000	0.000
	4	0.906	0.600	0.178	0.000	0.000	0.000
in 2nd diff	0	0.000	0.000	0.000	0.000	0.000	0.000
	1	0.000	0.000	0.000	0.000	0.000	0.000
	2	0.000	0.000	0.000	0.000	0.000	0.000
	3	0.000	0.000	0.000	0.000	0.000	0.000
	4	0.101	0.054	0.004	0.000	0.000	0.000

PROD

	lag	ADF-trend	ADF-const	ADF-none	PP-trend	PP-const	PP-none
in levels	0	0.210	0.988	1.000	0.210	0.988	1.000
	1	0.029	0.996	0.999	0.229	0.991	1.000
	2	0.315	0.967	0.985	0.225	0.991	1.000
	3	0.585	0.951	0.966	0.225	0.991	1.000
	4	0.469	0.974	0.945	0.226	0.992	0.999
in 1st diff	0	0.000	0.000	0.000	0.000	0.000	0.000
	1	0.014	0.002	0.019	0.000	0.000	0.000
	2	0.033	0.004	0.073	0.000	0.000	0.000
	3	0.129	0.033	0.156	0.000	0.000	0.000
	4	0.273	0.071	0.282	0.000	0.000	0.000
in 2nd diff	0	0.000	0.000	0.000	0.000	0.000	0.000
	1	0.000	0.000	0.000	0.000	0.000	0.000
	2	0.001	0.000	0.000	0.000	0.000	0.000
	3	0.003	0.001	0.000	0.000	0.000	0.000
	4	0.138	0.040	0.003	0.000	0.000	0.000

OPEN

	lag	ADF-trend	ADF-const	ADF-none	PP-trend	PP-const	PP-none
in levels	0	0.468	0.794	0.877	0.468	0.794	0.877
	1	0.541	0.790	0.886	0.454	0.804	0.887
	2	0.293	0.712	0.823	0.387	0.792	0.870
	3	0.284	0.677	0.829	0.364	0.794	0.868
	4	0.632	0.653	0.884	0.378	0.807	0.879
in 1st diff	0	0.000	0.000	0.000	0.000	0.000	0.000
	1	0.038	0.008	0.001	0.000	0.000	0.000
	2	0.100	0.026	0.006	0.000	0.000	0.000
	3	0.036	0.009	0.003	0.000	0.000	0.000
	4	0.021	0.006	0.004	0.000	0.000	0.000
in 2nd diff	0	0.000	0.000	0.000	0.000	0.000	0.000
	1	0.000	0.000	0.000	0.000	0.000	0.000
	2	0.009	0.001	0.000	0.000	0.000	0.000
	3	0.040	0.008	0.000	0.000	0.000	0.000
	4	0.025	0.005	0.000	0.000	0.000	0.000

GDP

	lag	ADF-trend	ADF-const	ADF-none	PP-trend	PP-const	PP-none
in levels	0	1.000	0.000	1.000	1.000	0.000	1.000
	1	0.952	0.013	0.092	1.000	0.002	1.000
	2	1.000	0.045	0.589	1.000	0.009	0.999
	3	1.000	0.039	0.470	1.000	0.019	0.996
	4	1.000	0.023	0.267	1.000	0.028	0.992
in 1st diff	0	0.287	0.934	0.396	0.287	0.934	0.396
	1	0.035	0.560	0.227	0.268	0.858	0.374
	2	0.048	0.760	0.278	0.250	0.809	0.359
	3	0.063	0.900	0.313	0.254	0.797	0.355
	4	0.045	0.993	0.220	0.276	0.820	0.361
in 2nd diff	0	0.140	0.053	0.005	0.140	0.053	0.005
	1	0.065	0.024	0.002	0.107	0.040	0.003
	2	0.012	0.005	0.000	0.093	0.034	0.003
	3	0.000	0.000	0.000	0.093	0.034	0.003
	4	0.359	0.084	0.022	0.160	0.062	0.006

REG_DIFF

	lag	ADF-trend	ADF-const	ADF-none	PP-trend	PP-const	PP-none
in levels	0	0.966	0.000	1.000	0.966	0.000	1.000
	1	0.972	0.005	0.928	0.966	0.000	0.998
	2	0.982	0.001	0.886	0.971	0.000	0.994
	3	0.969	0.001	0.775	0.976	0.000	0.989
	4	0.922	0.025	0.545	0.977	0.000	0.982
in 1st diff	0	0.000	0.008	0.013	0.000	0.008	0.013
	1	0.000	0.051	0.045	0.000	0.009	0.017
	2	0.001	0.324	0.127	0.000	0.010	0.021
	3	0.094	0.774	0.150	0.000	0.010	0.024
	4	0.081	0.760	0.118	0.000	0.007	0.021
in 2nd diff	0	0.000	0.000	0.000	0.000	0.000	0.000
	1	0.000	0.000	0.000	0.000	0.000	0.000
	2	0.000	0.000	0.000	0.000	0.000	0.000
	3	0.003	0.000	0.000	0.000	0.000	0.000
	4	0.011	0.002	0.000	0.000	0.000	0.000

FDEBT

	lag	ADF-trend	ADF-const	ADF-none	PP-trend	PP-const	PP-none
in levels	0	0.488	0.442	0.588	0.488	0.442	0.588
	1	0.237	0.332	0.446	0.535	0.437	0.549
	2	0.055	0.171	0.275	0.566	0.411	0.515
	3	0.026	0.253	0.296	0.574	0.386	0.491
	4	0.084	0.481	0.245	0.579	0.364	0.471
in 1st diff	0	0.008	0.024	0.002	0.008	0.024	0.002
	1	0.320	0.416	0.072	0.009	0.040	0.003
	2	0.369	0.421	0.070	0.007	0.027	0.002
	3	0.555	0.402	0.057	0.006	0.023	0.002
	4	0.594	0.318	0.037	0.005	0.018	0.001
in 2nd diff	0	0.000	0.000	0.000	0.000	0.000	0.000
	1	0.001	0.000	0.000	0.000	0.000	0.000
	2	0.004	0.000	0.000	0.000	0.000	0.000
	3	0.015	0.003	0.000	0.000	0.000	0.000
	4	0.037	0.010	0.001	0.000	0.000	0.000

INT_CPI

	lag	ADF-trend	ADF-const	ADF-none	PP-trend	PP-const	PP-none
in levels	0	0.657	0.277	0.076	0.657	0.277	0.076
	1	0.069	0.218	0.043	0.447	0.259	0.061
	2	0.356	0.627	0.227	0.379	0.248	0.055
	3	0.495	0.636	0.251	0.377	0.249	0.055
	4	0.938	0.641	0.360	0.446	0.262	0.060
in 1st diff	0	0.038	0.009	0.001	0.038	0.009	0.001
	1	0.004	0.001	0.000	0.031	0.007	0.000
	2	0.021	0.004	0.000	0.036	0.009	0.001
	3	0.000	0.000	0.000	0.041	0.010	0.001
	4	0.136	0.054	0.010	0.063	0.016	0.001
in 2nd diff	0	0.000	0.000	0.000	0.000	0.000	0.000
	1	0.001	0.000	0.000	0.000	0.000	0.000
	2	0.040	0.008	0.000	0.000	0.000	0.000
	3	0.000	0.000	0.000	0.000	0.000	0.000
	4	0.004	0.001	0.000	0.000	0.000	0.000

INT_PPI

	lag	ADF-trend	ADF-const	ADF-none	PP-trend	PP-const	PP-none
in levels	0	0.965	0.584	0.299	0.965	0.584	0.299
	1	0.672	0.494	0.193	0.914	0.533	0.246
	2	0.428	0.121	0.075	0.863	0.497	0.214
	3	0.640	0.283	0.167	0.840	0.482	0.201
	4	0.857	0.370	0.280	0.849	0.487	0.200
in 1st diff	0	0.010	0.002	0.000	0.010	0.002	0.000
	1	0.054	0.027	0.002	0.009	0.002	0.000
	2	0.076	0.035	0.003	0.008	0.002	0.000
	3	0.045	0.021	0.002	0.008	0.001	0.000
	4	0.569	0.449	0.092	0.010	0.002	0.000
in 2nd diff	0	0.000	0.000	0.000	0.000	0.000	0.000
	1	0.002	0.000	0.000	0.000	0.000	0.000
	2	0.027	0.005	0.000	0.000	0.000	0.000
	3	0.000	0.000	0.000	0.000	0.000	0.000
	4	0.299	0.078	0.007	0.000	0.000	0.000

TOT

	lag	ADF-trend	ADF-const	ADF-none	PP-trend	PP-const	PP-none
in levels	0	0.042	0.018	0.092	0.042	0.018	0.092
	1	0.213	0.118	0.222	0.043	0.020	0.130
	2	0.208	0.067	0.323	0.042	0.019	0.141
	3	0.042	0.024	0.161	0.034	0.016	0.117
	4	0.286	0.166	0.466	0.041	0.018	0.128
in 1st diff	0	0.000	0.000	0.000	0.000	0.000	0.000
	1	0.000	0.000	0.000	0.000	0.000	0.000
	2	0.153	0.042	0.003	0.000	0.000	0.000
	3	0.025	0.005	0.000	0.000	0.000	0.000
	4	0.511	0.218	0.028	0.000	0.000	0.000
in 2nd diff	0	0.000	0.000	0.000	0.000	0.000	0.000
	1	0.000	0.000	0.000	0.000	0.000	0.000
	2	0.006	0.001	0.000	0.000	0.000	0.000
	3	0.000	0.000	0.000	0.000	0.000	0.000
	4	0.097	0.022	0.001	0.000	0.000	0.000

GOV

	lag	ADF-trend	ADF-const	ADF-none	PP-trend	PP-const	PP-none
in levels	0	1.000	1.000	1.000	1.000	1.000	1.000
	1	0.999	1.000	1.000	1.000	1.000	1.000
	2	0.999	1.000	0.998	1.000	1.000	1.000
	3	1.000	1.000	0.997	1.000	1.000	1.000
	4	1.000	1.000	0.992	1.000	1.000	1.000
in 1st diff	0	0.000	0.005	0.002	0.000	0.005	0.002
	1	0.020	0.143	0.072	0.000	0.006	0.003
	2	0.085	0.345	0.222	0.000	0.005	0.003
	3	0.289	0.621	0.480	0.000	0.004	0.002
	4	0.433	0.686	0.589	0.000	0.003	0.001
in 2nd diff	0	0.000	0.000	0.000	0.000	0.000	0.000
	1	0.000	0.000	0.000	0.000	0.000	0.000
	2	0.000	0.000	0.000	0.000	0.000	0.000
	3	0.005	0.001	0.000	0.000	0.000	0.000
	4	0.032	0.008	0.001	0.000	0.000	0.000

Slovakia (p-values)

RERCPI

	lag	ADF-trend	ADF-const	ADF-none	PP-trend	PP-const	PP-none
in levels	0	0.440	0.900	0.985	0.440	0.900	0.985
	1	0.151	0.873	0.949	0.332	0.888	0.975
	2	0.014	0.800	0.901	0.260	0.877	0.963
	3	0.103	0.924	0.971	0.265	0.881	0.964
	4	0.287	0.930	0.985	0.312	0.891	0.970
in 1st diff	0	0.006	0.001	0.000	0.006	0.001	0.000
	1	0.149	0.041	0.016	0.006	0.001	0.000
	2	0.038	0.008	0.005	0.005	0.001	0.000
	3	0.027	0.005	0.010	0.006	0.001	0.000
	4	0.079	0.018	0.056	0.007	0.001	0.000
in 2nd diff	0	0.000	0.000	0.000	0.000	0.000	0.000
	1	0.020	0.003	0.000	0.000	0.000	0.000
	2	0.051	0.010	0.001	0.000	0.000	0.000
	3	0.023	0.004	0.000	0.000	0.000	0.000
	4	0.019	0.003	0.000	0.000	0.000	0.000

RERPPI

	lag	ADF-trend	ADF-const	ADF-none	PP-trend	PP-const	PP-none
in levels	0	0.571	0.708	0.918	0.571	0.708	0.918
	1	0.343	0.621	0.868	0.490	0.688	0.897
	2	0.189	0.773	0.822	0.419	0.666	0.878
	3	0.263	0.611	0.894	0.412	0.668	0.877
	4	0.362	0.670	0.912	0.437	0.681	0.885
in 1st diff	0	0.003	0.000	0.000	0.003	0.000	0.000
	1	0.114	0.026	0.003	0.003	0.000	0.000
	2	0.070	0.017	0.005	0.002	0.000	0.000
	3	0.113	0.029	0.010	0.003	0.000	0.000
	4	0.071	0.017	0.009	0.003	0.000	0.000
in 2nd diff	0	0.000	0.000	0.000	0.000	0.000	0.000
	1	0.004	0.001	0.000	0.000	0.000	0.000
	2	0.018	0.003	0.000	0.000	0.000	0.000
	3	0.081	0.019	0.001	0.000	0.000	0.000
	4	0.008	0.001	0.000	0.000	0.000	0.000

PROD

	lag	ADF-trend	ADF-const	ADF-none	PP-trend	PP-const	PP-none
in levels	0	0.633	0.863	0.622	0.633	0.863	0.622
	1	0.355	0.715	0.433	0.507	0.803	0.529
	2	0.439	0.831	0.566	0.505	0.806	0.535
	3	0.844	0.899	0.742	0.556	0.845	0.591
	4	0.952	0.984	0.907	0.636	0.890	0.668
in 1st diff	0	0.002	0.001	0.000	0.002	0.001	0.000
	1	0.011	0.003	0.000	0.002	0.000	0.000
	2	0.007	0.002	0.000	0.003	0.001	0.000
	3	0.012	0.006	0.001	0.003	0.001	0.000
	4	0.065	0.042	0.009	0.003	0.001	0.000
in 2nd diff	0	0.000	0.000	0.000	0.000	0.000	0.000
	1	0.000	0.000	0.000	0.000	0.000	0.000
	2	0.007	0.001	0.000	0.000	0.000	0.000
	3	0.004	0.001	0.000	0.000	0.000	0.000
	4	0.002	0.000	0.000	0.000	0.000	0.000

OPEN

	lag	ADF-trend	ADF-const	ADF-none	PP-trend	PP-const	PP-none
in levels	0	0.134	0.712	0.825	0.134	0.712	0.825
	1	0.347	0.860	0.913	0.146	0.761	0.881
	2	0.276	0.906	0.918	0.131	0.769	0.894
	3	0.137	0.907	0.902	0.119	0.768	0.897
	4	0.336	0.928	0.949	0.129	0.785	0.919
in 1st diff	0	0.000	0.000	0.000	0.000	0.000	0.000
	1	0.003	0.000	0.000	0.000	0.000	0.000
	2	0.067	0.017	0.003	0.000	0.000	0.000
	3	0.048	0.011	0.004	0.000	0.000	0.000
	4	0.082	0.022	0.012	0.000	0.000	0.000
in 2nd diff	0	0.000	0.000	0.000	0.000	0.000	0.000
	1	0.000	0.000	0.000	0.000	0.000	0.000
	2	0.005	0.001	0.000	0.000	0.000	0.000
	3	0.015	0.003	0.000	0.000	0.000	0.000
	4	0.009	0.002	0.000	0.000	0.000	0.000

GDP

	lag	ADF-trend	ADF-const	ADF-none	PP-trend	PP-const	PP-none
in levels	0	0.678	0.557	1.000	0.678	0.557	1.000
	1	0.447	0.210	0.996	0.710	0.505	1.000
	2	0.568	0.296	0.984	0.728	0.456	0.999
	3	0.443	0.389	0.942	0.725	0.451	0.999
	4	0.455	0.710	0.916	0.714	0.469	0.997
in 1st diff	0	0.000	0.000	0.001	0.000	0.000	0.001
	1	0.003	0.002	0.033	0.000	0.000	0.001
	2	0.140	0.072	0.194	0.000	0.000	0.001
	3	0.662	0.310	0.299	0.000	0.000	0.001
	4	0.899	0.473	0.316	0.000	0.000	0.000
in 2nd diff	0	0.000	0.000	0.000	0.000	0.000	0.000
	1	0.000	0.000	0.000	0.000	0.000	0.000
	2	0.000	0.000	0.000	0.000	0.000	0.000
	3	0.001	0.000	0.000	0.000	0.000	0.000
	4	0.036	0.013	0.001	0.000	0.000	0.000

REG_DIFF

	lag	ADF-trend	ADF-const	ADF-none	PP-trend	PP-const	PP-none
in levels	0	0.801	0.973	1.000	0.801	0.973	1.000
	1	0.785	0.957	0.989	0.781	0.970	1.000
	2	0.729	0.925	0.927	0.756	0.967	0.999
	3	0.641	0.935	0.887	0.741	0.965	0.998
	4	0.349	0.814	0.600	0.716	0.961	0.997
in 1st diff	0	0.002	0.000	0.002	0.002	0.000	0.002
	1	0.158	0.041	0.057	0.002	0.000	0.002
	2	0.367	0.133	0.114	0.002	0.000	0.002
	3	0.887	0.543	0.268	0.002	0.000	0.002
	4	0.984	0.781	0.359	0.001	0.000	0.001
in 2nd diff	0	0.000	0.000	0.000	0.000	0.000	0.000
	1	0.000	0.000	0.000	0.000	0.000	0.000
	2	0.000	0.000	0.000	0.000	0.000	0.000
	3	0.001	0.000	0.000	0.000	0.000	0.000
	4	0.378	0.173	0.021	0.000	0.000	0.000

FDEBT

	lag	ADF-trend	ADF-const	ADF-none	PP-trend	PP-const	PP-none
in levels	0	0.995	0.395	0.854	0.995	0.395	0.854
	1	0.971	0.498	0.694	0.989	0.436	0.808
	2	0.991	0.456	0.745	0.988	0.442	0.791
	3	0.981	0.422	0.640	0.988	0.445	0.778
	4	0.977	0.386	0.588	0.987	0.449	0.763
in 1st diff	0	0.017	0.008	0.001	0.017	0.008	0.001
	1	0.018	0.013	0.002	0.015	0.007	0.001
	2	0.212	0.190	0.034	0.020	0.009	0.001
	3	0.375	0.381	0.084	0.022	0.010	0.001
	4	0.414	0.582	0.187	0.023	0.009	0.001
in 2nd diff	0	0.000	0.000	0.000	0.000	0.000	0.000
	1	0.000	0.000	0.000	0.000	0.000	0.000
	2	0.001	0.000	0.000	0.000	0.000	0.000
	3	0.004	0.001	0.000	0.000	0.000	0.000
	4	0.006	0.004	0.000	0.000	0.000	0.000

INT_CPI

	lag	ADF-trend	ADF-const	ADF-none	PP-trend	PP-const	PP-none
in levels	0	0.723	0.360	0.059	0.723	0.360	0.059
	1	0.723	0.385	0.068	0.702	0.341	0.054
	2	0.568	0.261	0.037	0.664	0.308	0.045
	3	0.374	0.141	0.015	0.631	0.281	0.039
	4	0.525	0.249	0.036	0.627	0.275	0.038
in 1st diff	0	0.001	0.000	0.000	0.001	0.000	0.000
	1	0.167	0.051	0.004	0.001	0.000	0.000
	2	0.470	0.203	0.026	0.001	0.000	0.000
	3	0.257	0.101	0.010	0.001	0.000	0.000
	4	0.543	0.272	0.040	0.001	0.000	0.000
in 2nd diff	0	0.000	0.000	0.000	0.000	0.000	0.000
	1	0.000	0.000	0.000	0.000	0.000	0.000
	2	0.057	0.012	0.001	0.000	0.000	0.000
	3	0.039	0.007	0.000	0.000	0.000	0.000
	4	0.065	0.014	0.001	0.000	0.000	0.000

INT_PPI

	lag	ADF-trend	ADF-const	ADF-none	PP-trend	PP-const	PP-none
in levels	0	0.730	0.365	0.096	0.730	0.365	0.096
	1	0.877	0.556	0.198	0.792	0.424	0.124
	2	0.570	0.172	0.067	0.780	0.409	0.114
	3	0.330	0.102	0.030	0.732	0.361	0.092
	4	0.627	0.279	0.102	0.737	0.363	0.091
in 1st diff	0	0.000	0.000	0.000	0.000	0.000	0.000
	1	0.003	0.001	0.000	0.000	0.000	0.000
	2	0.544	0.296	0.047	0.000	0.000	0.000
	3	0.300	0.139	0.015	0.000	0.000	0.000
	4	0.305	0.179	0.023	0.000	0.000	0.000
in 2nd diff	0	0.000	0.000	0.000	0.000	0.000	0.000
	1	0.000	0.000	0.000	0.000	0.000	0.000
	2	0.023	0.004	0.000	0.000	0.000	0.000
	3	0.079	0.019	0.001	0.000	0.000	0.000
	4	0.019	0.004	0.000	0.000	0.000	0.000

GOV

	lag	ADF-trend	ADF-const	ADF-none	PP-trend	PP-const	PP-none
in levels	0	0.517	0.440	1.000	0.517	0.440	1.000
	1	0.703	0.804	0.993	0.476	0.479	1.000
	2	0.667	0.868	0.976	0.437	0.507	0.999
	3	0.572	0.826	0.942	0.412	0.520	0.998
	4	0.844	0.865	0.976	0.408	0.516	0.998
in 1st diff	0	0.001	0.000	0.001	0.001	0.000	0.001
	1	0.066	0.014	0.026	0.001	0.000	0.002
	2	0.249	0.084	0.107	0.001	0.000	0.002
	3	0.095	0.024	0.071	0.001	0.000	0.001
	4	0.479	0.255	0.365	0.001	0.000	0.001
in 2nd diff	0	0.000	0.000	0.000	0.000	0.000	0.000
	1	0.000	0.000	0.000	0.000	0.000	0.000
	2	0.038	0.008	0.000	0.000	0.000	0.000
	3	0.007	0.001	0.000	0.000	0.000	0.000
	4	0.041	0.007	0.000	0.000	0.000	0.000

Slovenia (p-values)

RERCPI

	lag	ADF-trend	ADF-const	ADF-none	PP-trend	PP-const	PP-none
in levels	0	0.451	0.861	0.903	0.451	0.861	0.903
	1	0.252	0.421	0.783	0.309	0.839	0.861
	2	0.523	0.528	0.847	0.273	0.840	0.853
	3	0.073	0.168	0.735	0.236	0.838	0.842
	4	0.175	0.056	0.856	0.222	0.842	0.839
in 1st diff	0	0.001	0.000	0.000	0.001	0.000	0.000
	1	0.002	0.000	0.000	0.001	0.000	0.000
	2	0.036	0.016	0.010	0.000	0.000	0.000
	3	0.001	0.001	0.003	0.000	0.000	0.000
	4	0.001	0.001	0.003	0.000	0.000	0.000
in 2nd diff	0	0.000	0.000	0.000	0.000	0.000	0.000
	1	0.000	0.000	0.000	0.000	0.000	0.000
	2	0.015	0.003	0.000	0.000	0.000	0.000
	3	0.043	0.007	0.000	0.000	0.000	0.000
	4	0.021	0.003	0.000	0.000	0.000	0.000

RERPPI

	lag	ADF-trend	ADF-const	ADF-none	PP-trend	PP-const	PP-none
in levels	0	0.661	0.643	0.353	0.661	0.643	0.353
	1	0.571	0.160	0.158	0.552	0.592	0.299
	2	0.538	0.178	0.177	0.490	0.569	0.276
	3	0.275	0.035	0.119	0.440	0.552	0.258
	4	0.277	0.019	0.189	0.421	0.555	0.255
in 1st diff	0	0.000	0.000	0.000	0.000	0.000	0.000
	1	0.014	0.004	0.000	0.000	0.000	0.000
	2	0.025	0.014	0.002	0.000	0.000	0.000
	3	0.015	0.014	0.002	0.000	0.000	0.000
	4	0.011	0.014	0.002	0.000	0.000	0.000
in 2nd diff	0	0.000	0.000	0.000	0.000	0.000	0.000
	1	0.000	0.000	0.000	0.000	0.000	0.000
	2	0.005	0.001	0.000	0.000	0.000	0.000
	3	0.054	0.012	0.001	0.000	0.000	0.000
	4	0.041	0.008	0.000	0.000	0.000	0.000

PROD

	lag	ADF-trend	ADF-const	ADF-none	PP-trend	PP-const	PP-none
in levels	0	0.003	0.628	0.858	0.003	0.628	0.858
	1	0.011	0.692	0.939	0.003	0.686	0.911
	2	0.016	0.772	0.960	0.003	0.713	0.936
	3	0.088	0.898	0.988	0.003	0.735	0.960
	4	0.451	0.958	0.998	0.004	0.751	0.977
in 1st diff	0	0.000	0.000	0.000	0.000	0.000	0.000
	1	0.000	0.000	0.000	0.000	0.000	0.000
	2	0.001	0.000	0.000	0.000	0.000	0.000
	3	0.000	0.000	0.000	0.000	0.000	0.000
	4	0.005	0.001	0.009	0.000	0.000	0.000
in 2nd diff	0	0.000	0.000	0.000	0.000	0.000	0.000
	1	0.000	0.000	0.000	0.000	0.000	0.000
	2	0.000	0.000	0.000	0.000	0.000	0.000
	3	0.000	0.000	0.000	0.000	0.000	0.000
	4	0.000	0.000	0.000	0.000	0.000	0.000

OPEN

	lag	ADF-trend	ADF-const	ADF-none	PP-trend	PP-const	PP-none
in levels	0	0.830	0.538	0.187	0.830	0.538	0.187
	1	0.000	0.000	0.000	0.616	0.309	0.079
	2	0.159	0.040	0.027	0.473	0.206	0.046
	3	0.221	0.058	0.059	0.413	0.170	0.036
	4	0.091	0.019	0.059	0.416	0.172	0.036
in 1st diff	0	0.643	0.325	0.052	0.643	0.325	0.052
	1	0.003	0.000	0.000	0.404	0.160	0.019
	2	0.005	0.001	0.000	0.302	0.107	0.011
	3	0.022	0.007	0.000	0.287	0.100	0.010
	4	0.473	0.197	0.025	0.342	0.126	0.014
in 2nd diff	0	0.148	0.041	0.003	0.148	0.041	0.003
	1	0.070	0.016	0.001	0.114	0.030	0.002
	2	0.017	0.003	0.000	0.100	0.025	0.002
	3	0.001	0.000	0.000	0.099	0.025	0.002
	4	0.298	0.104	0.010	0.153	0.042	0.003

GDP

	lag	ADF-trend	ADF-const	ADF-none	PP-trend	PP-const	PP-none
in levels	0	0.021	0.639	1.000	0.021	0.639	1.000
	1	0.180	0.369	1.000	0.032	0.470	1.000
	2	0.792	0.511	0.998	0.028	0.368	1.000
	3	0.589	0.826	0.974	0.019	0.434	1.000
	4	0.423	0.605	0.896	0.020	0.313	1.000
in 1st diff	0	0.000	0.000	0.000	0.000	0.000	0.000
	1	0.000	0.000	0.014	0.000	0.000	0.000
	2	0.041	0.009	0.122	0.000	0.000	0.000
	3	0.098	0.049	0.345	0.000	0.000	0.000
	4	0.291	0.127	0.276	0.000	0.000	0.000
in 2nd diff	0	0.000	0.000	0.000	0.000	0.000	0.000
	1	0.000	0.000	0.000	0.000	0.000	0.000
	2	0.000	0.000	0.000	0.000	0.000	0.000
	3	0.001	0.000	0.000	0.000	0.000	0.000
	4	0.044	0.009	0.001	0.000	0.000	0.000

REG_DIFF

	lag	ADF-trend	ADF-const	ADF-none	PP-trend	PP-const	PP-none
in levels	0	0.100	0.002	1.000	0.100	0.002	1.000
	1	0.290	0.089	0.974	0.118	0.004	0.999
	2	0.114	0.168	0.886	0.132	0.008	0.996
	3	0.864	0.564	0.989	0.137	0.009	0.994
	4	0.472	0.409	0.905	0.139	0.010	0.990
in 1st diff	0	0.001	0.001	0.003	0.001	0.001	0.003
	1	0.149	0.109	0.064	0.001	0.001	0.004
	2	0.010	0.001	0.001	0.001	0.001	0.004
	3	0.349	0.202	0.116	0.001	0.001	0.004
	4	0.254	0.216	0.159	0.001	0.001	0.004
in 2nd diff	0	0.000	0.000	0.000	0.000	0.000	0.000
	1	0.000	0.000	0.000	0.000	0.000	0.000
	2	0.002	0.000	0.000	0.000	0.000	0.000
	3	0.066	0.011	0.001	0.000	0.000	0.000
	4	0.124	0.027	0.002	0.000	0.000	0.000

FDEBT

	lag	ADF-trend	ADF-const	ADF-none	PP-trend	PP-const	PP-none
in levels	0	0.880	0.862	0.995	0.880	0.862	0.995
	1	0.433	0.829	0.901	0.774	0.854	0.984
	2	0.161	0.844	0.855	0.684	0.848	0.973
	3	0.058	0.788	0.787	0.613	0.843	0.962
	4	0.094	0.827	0.853	0.581	0.841	0.955
in 1st diff	0	0.028	0.006	0.002	0.028	0.006	0.002
	1	0.187	0.055	0.015	0.030	0.006	0.002
	2	0.447	0.177	0.058	0.029	0.006	0.002
	3	0.313	0.104	0.047	0.024	0.005	0.002
	4	0.306	0.092	0.073	0.023	0.005	0.002
in 2nd diff	0	0.000	0.000	0.000	0.000	0.000	0.000
	1	0.000	0.000	0.000	0.000	0.000	0.000
	2	0.023	0.005	0.000	0.000	0.000	0.000
	3	0.050	0.014	0.001	0.000	0.000	0.000
	4	0.032	0.015	0.001	0.000	0.000	0.000

INT_CPI

	lag	ADF-trend	ADF-const	ADF-none	PP-trend	PP-const	PP-none
in levels	0	0.008	0.078	0.127	0.008	0.078	0.127
	1	0.001	0.063	0.124	0.007	0.062	0.124
	2	0.005	0.235	0.171	0.008	0.070	0.147
	3	0.382	0.203	0.015	0.010	0.084	0.185
	4	0.039	0.157	0.042	0.010	0.073	0.183
in 1st diff	0	0.000	0.000	0.000	0.000	0.000	0.000
	1	0.000	0.000	0.000	0.000	0.000	0.000
	2	0.000	0.000	0.000	0.000	0.000	0.000
	3	0.056	0.017	0.002	0.000	0.000	0.000
	4	0.014	0.005	0.001	0.000	0.000	0.000
in 2nd diff	0	0.000	0.000	0.000	0.000	0.000	0.000
	1	0.000	0.000	0.000	0.000	0.000	0.000
	2	0.000	0.000	0.000	0.000	0.000	0.000
	3	0.003	0.000	0.000	0.000	0.000	0.000
	4	0.009	0.001	0.000	0.000	0.000	0.000

INT_PPI

	lag	ADF-trend	ADF-const	ADF-none	PP-trend	PP-const	PP-none
in levels	0	0.036	0.166	0.148	0.036	0.166	0.148
	1	0.009	0.117	0.125	0.026	0.143	0.147
	2	0.108	0.275	0.111	0.033	0.178	0.171
	3	0.108	0.042	0.006	0.041	0.220	0.195
	4	0.101	0.120	0.037	0.043	0.223	0.201
in 1st diff	0	0.000	0.000	0.000	0.000	0.000	0.000
	1	0.000	0.000	0.000	0.000	0.000	0.000
	2	0.000	0.000	0.000	0.000	0.000	0.000
	3	0.026	0.008	0.001	0.000	0.000	0.000
	4	0.084	0.036	0.005	0.000	0.000	0.000
in 2nd diff	0	0.000	0.000	0.000	0.000	0.000	0.000
	1	0.000	0.000	0.000	0.000	0.000	0.000
	2	0.000	0.000	0.000	0.000	0.000	0.000
	3	0.000	0.000	0.000	0.000	0.000	0.000
	4	0.004	0.001	0.000	0.000	0.000	0.000

GOV

	lag	ADF-trend	ADF-const	ADF-none	PP-trend	PP-const	PP-none
in levels	0	0.000	0.000	0.000	0.000	0.000	0.000
	1	0.002	0.001	0.000	0.000	0.000	0.000
	2	0.053	0.025	0.005	0.000	0.000	0.000
	3	0.128	0.055	0.016	0.000	0.000	0.000
	4	0.323	0.125	0.052	0.000	0.000	0.000
in 1st diff	0	0.000	0.000	0.000	0.000	0.000	0.000
	1	0.000	0.000	0.000	0.000	0.000	0.000
	2	0.000	0.000	0.000	0.000	0.000	0.000
	3	0.001	0.000	0.000	0.000	0.000	0.000
	4	0.009	0.002	0.000	0.000	0.000	0.000
in 2nd diff	0	0.000	0.000	0.000	0.000	0.000	0.000
	1	0.000	0.000	0.000	0.000	0.000	0.000
	2	0.000	0.000	0.000	0.000	0.000	0.000
	3	0.000	0.000	0.000	0.000	0.000	0.000
	4	0.000	0.000	0.000	0.000	0.000	0.000

APPENDIX B. Panel Unit Root Tests

RERCPI			RERCPI			PROD			OPEN			GDP		
PAN_9														
lag	No trend	Trend	lag	No trend	Trend	lag	No trend	Trend	lag	No trend	Trend	lag	No trend	Trend
1	-0.693	-0.552	1	-2.365	-0.517	1	1.898	-0.974	1	-2.970	-3.024	1	3.228	0.280
	(0.244)	(0.291)		(0.009)	(0.303)		(0.029)	(0.165)		(0.001)	(0.001)		(0.001)	(0.390)
2	-0.140	-1.036	2	-2.721	-2.214	2	2.732	-0.759	2	-0.720	-0.405	2	1.863	0.362
	(0.445)	(0.150)		(0.003)	(0.013)		(0.003)	(0.224)		(0.236)	(0.343)		(0.031)	(0.359)
3	-0.633	-0.580	3	-2.110	-1.594	3	3.441	-0.531	3	-0.197	-0.361	3	1.856	0.454
	(0.263)	(0.281)		(0.017)	(0.056)		(0.000)	(0.298)		(0.422)	(0.359)		(0.032)	(0.325)
4	-0.389	-0.757	4	-1.086	-1.130	4	5.406	2.069	4	-0.459	0.093	4	2.196	0.756
	(0.349)	(0.225)		(0.139)	(0.129)		(0.000)	(0.019)		(0.323)	(0.463)		(0.014)	(0.225)
PAN_8														
	No trend	Trend		No trend	Trend		No trend	Trend		No trend	Trend		No trend	Trend
1	-0.264	0.020	1	-1.049	-0.784	1	1.094	-1.737	1	-2.541	-1.155	1	2.520	-0.666
	(0.396)	(0.492)		(0.147)	(0.216)		(0.137)	(0.041)		(0.006)	(0.124)		(0.006)	(0.253)
2	-0.617	-0.752	2	-1.376	-1.598	2	1.809	-1.554	2	-1.086	-0.462	2	1.786	0.292
	(0.269)	(0.226)		(0.084)	(0.055)		(0.035)	(0.060)		(0.139)	(0.322)		(0.037)	(0.385)
3	-0.755	-1.462	3	-0.964	-1.110	3	1.166	-1.351	3	-1.024	-0.943	3	3.224	-0.371
	(0.225)	(0.072)		(0.167)	(0.134)		(0.122)	(0.088)		(0.153)	(0.173)		(0.001)	(0.355)
4	-0.388	-1.254	4	-0.864	-1.492	4	3.200	0.818	4	-0.894	-0.300	4	2.967	-0.118
	(0.349)	(0.105)		(0.194)	(0.068)		(0.001)	(0.207)		(0.186)	(0.382)		(0.002)	(0.453)
PAN_5														
	No trend	Trend		No trend	Trend		No trend	Trend		No trend	Trend		No trend	Trend
1	1.873	-1.738	1	0.163	-1.519	1	2.484	-0.378	1	-2.832	-1.725	1	0.289	0.461
	(0.031)	(0.041)		(0.435)	(0.064)		(0.007)	(0.353)		(0.002)	(0.042)		(0.386)	(0.323)
2	1.537	-1.862	2	0.323	-1.389	2	2.801	-1.047	2	-0.485	0.047	2	0.114	1.423
	(0.062)	(0.031)		(0.373)	(0.082)		(0.003)	(0.148)		(0.314)	(0.481)		(0.454)	(0.077)
3	2.133	-1.493	3	0.278	-1.179	3	2.090	-0.175	3	-0.248	-0.512	3	1.357	1.237
	(0.016)	(0.068)		(0.390)	(0.119)		(0.018)	(0.431)		(0.402)	(0.304)		(0.087)	(0.108)
4	2.012	-0.961	4	0.324	-1.520	4	4.014	1.194	4	-0.740	0.035	4	1.779	0.173
	(0.022)	(0.168)		(0.373)	(0.064)		(0.000)	(0.116)		(0.230)	(0.486)		(0.038)	(0.431)

Note: p-values are in parentheses below t-stats.

REG_DIFF			RIR_CPI			RIR_PPI			GOV			FDEBT		
PAN_9														
	No trend	Trend		No trend	Trend		No trend	Trend		No trend	Trend		No trend	Trend
1	-3.039	0.290	1	-2.603	-2.391	1	-3.097	-2.474	1	4.513	1.889	1	-2.763	1.344
	(0.001)	(0.386)		(0.005)	(0.008)		(0.001)	(0.007)		(0.000)	(0.029)		(0.003)	(0.089)
2	-3.917	0.653	2	-2.260	-0.901	2	-2.442	-1.477	2	4.336	1.307	2	-4.199	0.423
	(0.000)	(0.257)		(0.012)	(0.184)		(0.007)	(0.070)		(0.000)	(0.096)		(0.000)	(0.336)
3	-1.783	1.637	3	-3.414	-1.709	3	-2.941	-1.894	3	4.795	1.129	3	-3.493	-1.329
	(0.037)	(0.051)		(0.000)	(0.044)		(0.002)	(0.029)		(0.000)	(0.130)		(0.000)	(0.092)
4	-0.322	2.276	4	-3.909	-0.904	4	-2.678	-0.910	4	4.624	1.678	4	-3.502	-0.631
	(0.374)	(0.011)		(0.000)	(0.183)		(0.004)	(0.181)		(0.000)	(0.047)		(0.000)	(0.264)
PAN_8														
	No trend	Trend		No trend	Trend		No trend	Trend		No trend	Trend		No trend	Trend
1	-6.141	-1.178	1	-3.297	-3.775	1	-4.173	-1.888	1	4.156	0.790	1	-1.230	0.895
	(0.000)	(0.119)		(0.000)	(0.000)		(0.000)	(0.030)		(0.000)	(0.215)		(0.109)	(0.185)
2	-6.205	-1.177	2	-3.188	-1.106	2	-3.064	-0.775	2	4.674	1.029	2	-1.074	1.647
	(0.000)	(0.120)		(0.001)	(0.134)		(0.001)	(0.219)		(0.000)	(0.152)		(0.141)	(0.050)
3	-6.226	-0.730	3	-4.616	-2.767	3	-4.760	-3.167	3	4.346	1.218	3	-0.965	1.614
	(0.000)	(0.233)		(0.000)	(0.003)		(0.000)	(0.001)		(0.000)	(0.112)		(0.167)	(0.053)
4	-3.624	-0.802	4	-3.159	-0.901	4	-3.292	-1.433	4	4.460	1.390	4	-1.215	1.450
	(0.000)	(0.211)		(0.001)	(0.184)		(0.001)	(0.076)		(0.000)	(0.082)		(0.112)	(0.074)
PAN_5														
	No trend	Trend		No trend	Trend		No trend	Trend		No trend	Trend		No trend	Trend
1	-0.840	2.194	1	-1.935	-1.184	1	-1.993	-0.732	1	3.845	0.635	1	-0.277	1.126
	(0.200)	(0.014)		(0.026)	(0.118)		(0.023)	(0.232)		(0.000)	(0.263)		(0.391)	(0.130)
2	-2.414	1.924	2	-3.067	-1.450	2	-2.030	-0.914	2	4.551	1.465	2	-0.694	1.168
	(0.008)	(0.027)		(0.001)	(0.074)		(0.021)	(0.180)		(0.000)	(0.071)		(0.244)	(0.121)
3	-3.720	1.579	3	-4.124	-2.938	3	-3.552	-3.122	3	4.278	1.846	3	-0.280	1.325
	(0.000)	(0.057)		(0.000)	(0.002)		(0.000)	(0.001)		(0.000)	(0.032)		(0.390)	(0.093)
4	-2.626	0.233	4	-2.415	-0.702	4	-1.306	-0.547	4	4.366	2.041	4	-0.488	1.341
	(0.004)	(0.408)		(0.008)	(0.241)		(0.096)	(0.292)		(0.000)	(0.021)		(0.313)	(0.090)

Note: p-values are in parentheses below t-stats.

APPENDIX C. Time Series Estimates

Czech Republic, 1993-2002

1993_eq1

	EG			dols_SIC			dols_AIC			dols_HQ			ardl_SIC		ardl_AIC		ardl_HQ	
SIC	0	-3.212	NO	0	-5.967	5%	0	-5.967	5%	0	-5.967	5%	4.975	5%	6.746	5%	6.746	5%
AIC	1	-3.68	NO	3	-4.615	10%	3	-4.615	10%	3	-4.615	10%	1	0	2	1	2	1
HQ	0	-3.212	NO	3	-4.615	10%	3	-4.615	10%	3	-4.615	10%						
	coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat	coeff	t-stat	coeff	t-stat
CONST	-0.011	-0.459		-0.13	-3.023		-0.13	-3.023		-0.13	-3.023		-0.048	-1.535	-0.06	-2.384	-0.06	-2.384
GDP	-0.966	-5.455		-0.269	-0.856		-0.269	-0.856		-0.269	-0.856		-0.986	-4.265	-0.794	-4.842	-0.794	-4.842
INTCPI	-0.005	-2.384		-0.009	-2.507		-0.009	-2.507		-0.009	-2.507		-0.005	-1.561	-0.006	-2.809	-0.006	-2.809
REGD	-0.481	-12.251		-0.727	-4.12		-0.727	-4.12		-0.727	-4.12		-0.508	-3.57	-0.608	-4.583	-0.608	-4.583
FDEBT	0.181	3.556		0.466	2.763		0.466	2.763		0.466	2.763		0.269	2.831	0.362	3.965	0.362	3.965
leads+lags				2	2		2	2		2	2							

1993_eq2

	EG			dols_SIC			dols_AIC			dols_HQ			ardl_SIC		ardl_AIC		ardl_HQ	
SIC	1	-4.972	5%	3	-5.925	5%	3	-5.925	5%	3	-5.925	5%	2.74	AMB10 %	2.74	AMB10 %	2.74	AMB10 %
AIC	1	-4.972	5%	3	-5.925	5%	3	-5.925	5%	3	-5.925	5%	1	0	1	0	1	0
HQ	100%	-4.972	5%	3	-5.925	5%	3	-5.925	5%	3	-5.925	5%						
	coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat	coeff	t-stat	coeff	t-stat
CONST	-0.061	-2.956		0.12	0.868		0.12	0.868		0.12	0.868		-0.028	-0.679	-0.028	-0.679	-0.028	-0.679
PROD1	-0.255	-1.738		-2.107	-1.652		-2.107	-1.652		-2.107	-1.652		-0.539	-2.095	-0.539	-2.095	-0.539	-2.095
INTCPI	-0.01	-5.262		0.003	0.234		0.003	0.234		0.003	0.234		-0.005	-1.048	-0.005	-1.048	-0.005	-1.048
REGD	-0.246	-4.862		-0.357	-1.771		-0.357	-1.771		-0.357	-1.771		-0.238	-2.174	-0.238	-2.174	-0.238	-2.174
GOV	-1.762	-3.731		2.047	0.497		2.047	0.497		2.047	0.497		-1.31	-1.183	-1.31	-1.183	-1.31	-1.183
leads+lags				2	2		2	2		2	2							

1993_eq3

	EG			dols_SIC			dols_AIC			dols_HQ			ardl_SIC		ardl_AIC		ardl_HQ	
SIC	1	-5.21	5%	3	-6.09	5%	3	-9.159	5%	3	-9.159	5%	2.34	AMB10 %	3.076	AMB10 %	3.076	AMB10 %
AIC	1	-5.21	5%	3	-6.09	5%	3	-9.159	5%	3	-9.159	5%	1	0	1	1	1	1
HQ	1	-5.21	5%	3	-6.09	5%	3	-9.159	5%	3	-9.159	5%						
	coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat	coeff	t-stat	coeff	t-stat
CONST	-0.055	-2.934		-0.076	-3.68		-0.086	-3.468		-0.086	-3.468		-0.059	-1.579	-0.046	-0.917	-0.046	-0.917
PROD2	-0.327	-2.502		-0.259	-1.932		-0.343	-2.047		-0.343	-2.047		-0.32	-1.381	-0.66	-2.46	-0.66	-2.46
INTCPI	-0.007	-3.723		-0.01	-4.285		-0.011	-3.982		-0.011	-3.982		-0.007	-1.418	-0.007	-1.201	-0.007	-1.201
REGD	-0.249	-3.866		-0.168	-2.66		-0.084	-1.215		-0.084	-1.215		-0.156	-1.207	-0.103	-0.744	-0.103	-0.744
GOV	-1.953	-5.255		-2.228	-5.624		-2.168	-4.056		-2.168	-4.056		-1.992	-2.125	-1.098	-0.852	-1.098	-0.852
OPEN3	0.216	2.214		0.069	0.693		-0.072	-0.636		-0.072	-0.636		0.011	0.064	-0.12	-0.573	-0.12	-0.573
leads+lags				0	0		0	1		0	1							

1993_eq4

	EG			dols_SIC			dols_AIC			dols_HQ			ardl_SIC		ardl_AIC		ardl_HQ	
SIC	1	-4.322	NO	0	-4.245	NO	1	-5.786	5%	0	-4.245	NO	3.556	10%	4.642	5%	4.642	5%
AIC	1	-4.322	NO	1	-4.487	10%	3	-4.814	5%	1	-4.487	10%	1	0	1	1	1	1
HQ	1	-4.322	NO	1	-4.487	10%	1	-5.786	5%	1	-4.487	10%						
	coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat	coeff	t-stat	coeff	t-stat
CONST	0.025	3.144		0.014	1.6		0.004	0.358		0.014	1.6		0.011	0.806	0.01	0.832	0.01	0.832
GDP	-1.162	-11.107		-1.123	-10.827		-1.105	-6.302		-1.123	-10.827		-1.017	-3.405	-1.113	-3.956	-1.113	-3.956
GOV	-0.942	-4.42		-1.07	-4.5		-0.665	-1.403		-1.07	-4.5		-1.096	-2.445	-0.973	-1.944	-0.973	-1.944
REGD	-0.424	-12.583		-0.381	-10.81		-0.417	-9.044		-0.381	-10.81		-0.363	-3.05	-0.381	-3.645	-0.381	-3.645
OPEN3	0.399	6.295		0.318	4.752		0.163	1.643		0.318	4.752		0.243	1.761	0.23	1.713	0.23	1.713
leads+lags				0	0		0	2		0	0							

1993_eq5

	EG			dols_SIC			dols_AIC			dols_HQ			ardl_SIC		ardl_AIC		ardl_HQ	
SIC	1	-5.35	5%	1	-5.846	5%	3	-5.64	5%	3	-5.64	5%	3.886	5%	3.886	5%	3.886	5%
AIC	1	-5.35	5%	1	-5.846	5%	3	-5.64	5%	3	-5.64	5%	1	1	1	1	1	1
HQ	1	-5.35	5%	1	-5.846	5%	3	-5.64	5%	3	-5.64	5%						
	coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat	coeff	t-stat	coeff	t-stat
CONST	-0.001	-0.068		-0.003	-0.319		-0.001	-0.088		-0.001	-0.088		0.001	0.072	0.001	0.072	0.001	0.072
PROD3	-0.351	-7.25		-0.39	-7.939		-0.45	-6.544		-0.45	-6.544		-0.456	-3.852	-0.456	-3.852	-0.456	-3.852
REGD	-0.254	-3.633		-0.213	-2.714		-0.222	-2.376		-0.222	-2.376		-0.218	-1.796	-0.218	-1.796	-0.218	-1.796
GOV	-2.558	-7.302		-2.689	-7.084		-2.542	-5.781		-2.542	-5.781		-2.505	-2.817	-2.505	-2.817	-2.505	-2.817
TOT2	-0.69	-3.406		-0.664	-2.747		-0.615	-2.281		-0.615	-2.281		-0.699	-1.942	-0.699	-1.942	-0.699	-1.942
OPEN3	0.251	2.359		0.226	1.971		0.189	1.421		0.189	1.421		0.158	0.907	0.158	0.907	0.158	0.907
leads+lags				0	0		0	1		0	1							

1993_eq6

	EG			dols_SIC			dols_AIC			dols_HQ			ardl_SIC		ardl_AIC		ardl_HQ	
SIC	1	-4.691	NO	3	-5.207	5%	3	-6.11	5%	3	-6.11	5%	2.511	AMB10 %	3.45	10%	3.45	10%
AIC	1	-4.691	NO	3	-5.207	5%	3	-6.11	5%	3	-6.11	5%	1	0	1	1	1	1
HQ	1	-4.691	NO	3	-5.207	5%	3	-6.11	5%	3	-6.11	5%						
	coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat	coeff	t-stat	coeff	t-stat
CONST	-0.039	-1.695		-0.06	-2.499		-0.046	-1.433		-0.046	-1.433		-0.06	-1.605	-0.006	-0.107	-0.006	-0.107
PROD3	-0.231	-2.7		-0.209	-2.496		-0.285	-2.583		-0.285	-2.583		-0.19	-1.369	-0.434	-2.667	-0.434	-2.667
INTCPI	-0.005	-1.94		-0.007	-2.604		-0.005	-1.531		-0.005	-1.531		-0.006	-1.287	-0.001	-0.218	-0.001	-0.218
REGD	-0.36	-5.662		-0.268	-4.229		-0.28	-3.503		-0.28	-3.503		-0.244	-1.769	-0.371	-2.64	-0.371	-2.64
GOV	-2.162	-6.204		-2.404	-7.05		-2.237	-5.214		-2.237	-5.214		-2.336	-2.605	-1.672	-1.508	-1.672	-1.508
OPEN3	0.335	2.85		0.218	1.843		0.189	1.374		0.189	1.374		0.132	0.638	0.215	0.982	0.215	0.982
leads+lags				0	0		0	1		0	1							

1993_eq7

	EG			dols_SIC			dols_AIC			dols_HQ			ardl_SIC		ardl_AIC		ardl_HQ	
SIC	1	-5.173	5%	2	-4.623	10%	3	-6.009	5%	3	-6.009	5%	2.441	NO	3.565	10%	3.565	10%
AIC	1	-5.173	5%	3	-4.705	10%	3	-6.009	5%	3	-6.009	5%	1	0	1	1	1	1
HQ	1	-5.173	5%	3	-4.705	10%	3	-6.009	5%	3	-6.009	5%						
	coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat	coeff	t-stat	coeff	t-stat
CONST	-0.064	-3.27		-0.061	-2.609		-0.094	-2.762		-0.094	-2.762		-0.025	-0.556	-0.019	-0.416	-0.019	-0.416
PROD2	-0.227	-1.758		-0.354	-2.36		-0.321	-1.352		-0.321	-1.352		-0.463	-1.862	-0.634	-2.389	-0.634	-2.389
INTCPI	-0.009	-4.893		-0.009	-3.802		-0.013	-3.705		-0.013	-3.705		-0.004	-0.617	-0.004	-0.753	-0.004	-0.753
REGD	-0.188	-3.063		-0.14	-2.069		0.017	0.218		0.017	0.218		-0.159	-1.294	-0.146	-1.367	-0.146	-1.367
GOV	-2.065	-5.319		-2.046	-4.297		-3.136	-3.823		-3.136	-3.823		-1.661	-1.507	-1.491	-1.252	-1.491	-1.252
leads+lags				0	0		1	1		1	1							

Czech Republic, 1994-2002

1994_eq1	Eq1																	
	EG			dols_SIC			dols_AIC			dols_HQ			ardl_SIC		ardl_AIC		ardl_HQ	
SIC	1	-3.795	NO	1	-4.596	10%	1	-5.18	5%	2	-4.725	10%	3.592	10%	3.592	10%	3.592	10%
AIC	1	-3.795	NO	2	-4.591	10%	4	-4.873	5%	3	-4.54	10%	1	1	1	1	1	1
HQ	1	-3.795	NO	2	-4.591	10%	4	-4.873	5%	2	-4.725	10%						
	coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat	coeff	t-stat	coeff	t-stat
CONST	-0.018	-0.714		-0.093	-2.691		-0.216	-1.226		-0.151	-3.501		-0.006	-0.111	-0.006	-0.111	-0.006	-0.111
GDP	-0.69	-3.203		-0.264	-0.854		1.543	0.698		0.415	0.966		-0.798	-2.118	-0.798	-2.118	-0.798	-2.118
INTCPI	-0.006	-2.065		-0.003	-0.784		-0.033	-1.299		-0.009	-1.731		0.001	0.259	0.001	0.259	0.001	0.259
GOV	-1.486	-3.453		-2.18	-3.244		-5.711	-1.1		-3.286	-3.416		-1.053	-0.9	-1.053	-0.9	-1.053	-0.9
REGD	-0.258	-5.186		-0.218	-3.48		-0.076	-0.173		-0.142	-1.582		-0.341	-3.449	-0.341	-3.449	-0.341	-3.449
leads+lags				1	0		2	2		2	0							

1994_eq2																		
	EG			dols_SIC			dols_AIC			dols_HQ			ardl_SIC		ardl_AIC		ardl_HQ	
SIC	1	-4.475	10%	0	-6.216	5%	0	-6.216	5%	0	-6.216	5%	2.511	AMB10 %	3.294	AMB10 %	3.294	AMB10 %
AIC	1	-4.475	10%	0	-6.216	5%	0	-6.216	5%	0	-6.216	5%	1	0	1	1	1	1
HQ	100%	-4.475	10%	0	-6.216	5%	0	-6.216	5%	0	-6.216	5%						
	coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat	coeff	t-stat	coeff	t-stat
CONST	-0.049	-2.103		0.253	1.845		0.253	1.845		0.253	1.845		-0.036	-0.733	-0.011	-0.21	-0.011	-0.21
PROD1	-0.337	-2.137		-3.399	-2.667		-3.399	-2.667		-3.399	-2.667		-0.484	-1.677	-0.667	-1.768	-0.667	-1.768
INTCPI	-0.008	-2.483		0.009	0.711		0.009	0.711		0.009	0.711		-0.004	-0.604	-0.001	-0.199	-0.001	-0.199
REGD	-0.258	-4.806		-0.587	-2.933		-0.587	-2.933		-0.587	-2.933		-0.222	-1.948	-0.303	-2.594	-0.303	-2.594
GOV	-1.517	-2.935		6.381	1.542		6.381	1.542		6.381	1.542		-1.511	-1.193	-0.813	-0.545	-0.813	-0.545
leads+lags				2	2		2	2		2	2							

1994_eq3																		
	EG			dols_SIC			dols_AIC			dols_HQ			ardl_SIC		ardl_AIC		ardl_HQ	
SIC	1	-4.947	5%	4	-5.186	5%	4	-5.186	5%	4	-5.186	5%	4.816	5%	4.816	5%	4.816	5%
AIC	1	-4.947	5%	4	-5.186	5%	4	-5.186	5%	4	-5.186	5%	1	1	1	1	1	1
HQ	1	-4.947	5%	4	-5.186	5%	4	-5.186	5%	4	-5.186	5%						
	coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat	coeff	t-stat	coeff	t-stat
CONST	-0.049	-2.133		-0.113	-0.955		-0.113	-0.955		-0.113	-0.955		0.004	0.092	0.004	0.092	0.004	0.092
PROD2	-0.316	-2.195		-0.064	-0.061		-0.064	-0.061		-0.064	-0.061		-0.761	-2.737	-0.761	-2.737	-0.761	-2.737
INTCPI	-0.007	-1.889		-0.025	-1.38		-0.025	-1.38		-0.025	-1.38		0.003	0.409	0.003	0.409	0.003	0.409
REGD	-0.183	-2.952		0.019	0.189		0.019	0.189		0.019	0.189		-0.163	-1.736	-0.163	-1.736	-0.163	-1.736
GOV	-1.869	-4.431		-4.698	-1.403		-4.698	-1.403		-4.698	-1.403		-0.938	-0.867	-0.938	-0.867	-0.938	-0.867
leads+lags				2	2		2	2		2	2							

1994_eq4																		
	EG			dols_SIC			dols_AIC			dols_HQ			ardl_SIC		ardl_AIC		ardl_HQ	
SIC	1	-4.839	5%	3	-5.422	5%	4	-5.287	5%	4	-5.287	5%	7.281	5%	7.281	5%	7.281	5%
AIC	1	-4.839	5%	3	-5.422	5%	4	-5.287	5%	4	-5.287	5%	2	1	2	1	2	1
HQ	1	-4.839	5%	3	-5.422	5%	4	-5.287	5%	4	-5.287	5%						
	coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat	coeff	t-stat	coeff	t-stat
CONST	0.004	0.249		0.016	0.776		0.05	1.236		0.05	1.236		-0.003	-0.175	-0.003	-0.175	-0.003	-0.175
PROD3	-0.324	-4.762		-0.51	-5.313		-0.857	-4.347		-0.857	-4.347		-0.349	-4.233	-0.349	-4.233	-0.349	-4.233
REGD	-0.136	-2.132		-0.103	-1.369		-0.135	-1.036		-0.135	-1.036		-0.112	-2.169	-0.112	-2.169	-0.112	-2.169
GOV	-2.748	-6.603		-2.903	-5.445		-2.083	-2.075		-2.083	-2.075		-2.759	-4.452	-2.759	-4.452	-2.759	-4.452
TOT2	-1.021	-4.061		-1.132	-4.105		-1.176	-2.132		-1.176	-2.132		-1.007	-3.67	-1.007	-3.67	-1.007	-3.67
leads+lags				0	1		1	2		1	2							

1994_eq5																		
	EG			dols_SIC			dols_AIC			dols_HQ			ardl_SIC		ardl_AIC		ardl_HQ	
SIC	0	-2.7	NO	1	-3.95	10%	1	-3.95	10%	1	-3.95	10%	1.831	NO	1.313	NO	1.831	NO
AIC	0	-2.7	NO	1	-3.95	10%	1	-3.95	10%	1	-3.95	10%	1	0	3	3	1	0
HQ	0	-2.7	NO	1	-3.95	10%	1	-3.95	10%	1	-3.95	10%						
	coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat	coeff	t-stat	coeff	t-stat
CONST	0	0.007		0.071	4.17		0.071	4.17		0.071	4.17		-0.017	-0.227	-0.001	-0.014	-0.017	-0.227
PROD1	-1.568	-11.021		-2.338	-13.587		-2.338	-13.587		-2.338	-13.587		-2.047	-2.222	-2.204	-1.907	-2.047	-2.222
INTCPI	-0.008	-1.574		0.016	1.622		0.016	1.622		0.016	1.622		0.005	0.365	0.002	0.12	0.005	0.365
leads+lags				3	3		3	3		3	3							

1994_eq6																		
	EG			dols_SIC			dols_AIC			dols_HQ			ardl_SIC		ardl_AIC		ardl_HQ	
SIC	1	-4.295	5%	0	-3.235	NO	0	-3.563	NO	0	-3.563	NO	3.891	AMB10 %	3.891	AMB10 %	3.891	AMB10 %
AIC	1	-4.295	5%	2	-4.017	5%	4	-3.937	10%	4	-3.937	10%	1	0	1	0	1	0
HQ	1	-4.295	5%	1	-3.585	NO	2	-4.286	5%	2	-4.286	5%						
	coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat	coeff	t-stat	coeff	t-stat
CONST	0.013	1.14		0.048	3.993		0.039	2.843		0.039	2.843		0.016	0.655	0.016	0.655	0.016	0.655
PROD1	-0.652	-5.045		-1.57	-12.245		-1.523	-9.611		-1.523	-9.611		-0.846	-2.781	-0.846	-2.781	-0.846	-2.781
REGD	-0.376	-9.304		-0.185	-6.419		-0.184	-5.487		-0.184	-5.487		-0.332	-2.474	-0.332	-2.474	-0.332	-2.474
leads+lags				2	2		3	2		3	2							

1994_eq7																		
	EG			dols_SIC			dols_AIC			dols_HQ			ardl_SIC		ardl_AIC		ardl_HQ	
SIC	1	-4.978	5%	0	-6.208	5%	0	-6.208	5%	0	-6.208	5%	3.657	10%	5.595	5%	5.595	5%
AIC	1	-4.978	5%	3	-5.221	5%	3	-5.221	5%	3	-5.221	5%	1	0	2	1	2	1
HQ	1	-4.978	5%	3	-5.221	5%	3	-5.221	5%	3	-5.221	5%						
	coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat	coeff	t-stat	coeff	t-stat
CONST	-0.05	-2.287		0.052	0.791		0.052	0.791		0.052	0.791		-0.03	-0.829	0.007	0.322	0.007	0.322
PROD2	-0.522	-3.953		0.294	0.455		0.294	0.455		0.294	0.455		-0.551	-2.809	-0.541	-4.146	-0.541	-4.146
INTCPI	-0.008	-2.213		-0.001	-0.119		-0.001	-0.119		-0.001	-0.119		-0.005	-1.11	-0.003	-1.024	-0.003	-1.024
REG	-0.382	-7.73		-1.337	-2.719		-1.337	-2.719		-1.337	-2.719		-0.418	-2.843	-0.461	-3	-0.461	-3
FDEBT	0.274	4.9		0.984	3.015		0.984	3.015		0.984	3.015		0.323	2.978	0.304	2.956	0.304	2.956
leads+lags				2	2		2	2		2	2							

1994_eq7BIS																		
	EG			dols_SIC			dols_AIC			dols_HQ			ardl_SIC		ardl_AIC		ardl_HQ	
SIC	1	-4.978	5%	2	-4.833	5%	4	-5.473	5%	4	-5.473	5%	3.657	10%	5.28	5%	5.28	5%
AIC	1	-4.978	5%	2	-4.833	5%	4	-5.473	5%	4	-5.473	5%	1	0	1	1	1	1
HQ	1	-4.978	5%	2	-4.833	5%	4	-5.473	5%	4	-5.473	5%						
	coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat	coeff	t-stat	coeff	t-stat
CONST	-0.05	-2.287		-0.035	-1.278		0.018	0.445		0.018	0.445		-0.03	-0.829	-0.001	-0.019	-0.001	-0.019
PROD2	-0.522	-3.953		-0.657	-4.582		-0.923	-4.099		-0.923	-4.099		-0.551	-2.809	-0.667	-3.619	-0.667	-3.619
INTCPI	-0.008	-2.213		-0.005	-1.395		-0.001	-0.14		-0.001	-0.14		-0.005	-1.11	-0.002	-0.417	-0.002	-0.417
REG	-0.382	-7.73		-0.368	-6.054		-0.343	-2.538		-0.343	-2.538		-0.418	-2.843	-0.406	-2.397	-0.406	-2.397
FDEBT	0.274	4.9		0.29	4.324		0.283	2.113		0.283	2.113		0.323	2.978	0.297	2.262	0.297	2.262

leads+lags				0	0		1	1		1	1							
1994_eq8																		
	EG			dols_SIC			dols_AIC			dols_HQ			ardl_SIC		ardl_AIC		ardl_HQ	
SIC	1	-5.199	5%	0	-3.758	NO	2	-7.103	5%	1	-5.574	5%	6.84	5%	5.642	5%	6.84	5%
AIC	1	-5.199	5%	1	-4.054	10%	2	-7.103	5%	1	-5.574	5%	1	1	2	3	1	1
HQ	1	-5.199	5%	1	-4.054	10%	2	-7.103	5%	1	-5.574	5%						
	coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat	coeff	t-stat	coeff	t-stat
CONST	-0.013	-0.961		0.052	2.205		-0.046	-0.792		0.014	0.381		0.008	0.37	0.001	0.063	0.008	0.37
PROD2	-0.701	-5.51		-1.014	-4.054		-1.854	-3.043		-1.222	-2.966		-0.793	-4.108	-1.12	-3.742	-0.793	-4.108
REGD	-0.362	-6.713		-0.406	-1.61		0.474	0.626		-0.286	-0.587		-0.471	-3.066	-0.169	-0.9	-0.471	-3.066
FDEBT	0.19	4.089		0.305	1.982		-0.103	-0.222		0.32	1.089		0.326	3.514	0.166	1.452	0.326	3.514
leads+lags				2	1		2	3		2	2							
1994_eq8bis																		
	EG			dols_SIC			dols_AIC			dols_HQ			ardl_SIC		ardl_AIC		ardl_HQ	
SIC	1	-5.199	5%	3	-5.528	5%	3	-5.339	5%	3	-5.528	5%	6.84	5%	6.84	5%	6.84	5%
AIC	1	-5.199	5%	3	-5.528	5%	3	-5.339	5%	3	-5.528	5%	1	1	1	1	1	1
HQ	1	-5.199	5%	3	-5.528	5%	3	-5.339	5%	3	-5.528	5%						
	coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat	coeff	t-stat	coeff	t-stat
CONST	-0.013	-0.961		-0.01	-0.552		0.011	0.538		-0.01	-0.552		0.008	0.37	0.008	0.37	0.008	0.37
PROD2	-0.701	-5.51		-0.948	-7.198		-1.021	-6.568		-0.948	-7.198		-0.793	-4.108	-0.793	-4.108	-0.793	-4.108
REGD	-0.362	-6.713		-0.361	-3.674		-0.379	-2.667		-0.361	-3.674		-0.471	-3.066	-0.471	-3.066	-0.471	-3.066
FDEBT	0.19	4.089		0.292	4.043		0.308	3.063		0.292	4.043		0.326	3.514	0.326	3.514	0.326	3.514
leads+lags				0	1		1	1		0	1							

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1992_eq1

	EG			dols_SIC			dols_AIC			dols_HQ			ardl_SIC		ardl_AIC		ardl_HQ	
SIC	0	-2.93	NO	0	-3.005	NO	0	-6.111	5%	0	-6.111	5%	2.013	NO	2.013	NO	2.013	NO
AIC	0	-2.93	NO	0	-3.005	NO	0	-6.111	5%	0	-6.111	5%	2	0	2	0	2	0
HQ	0	-2.93	NO	0	-3.005	NO	0	-6.111	5%	0	-6.111	5%						
	coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat	coeff	t-stat	coeff	t-stat
CONST	0.03	3.572		0.022	2.195		0.019	0.483		0.019	0.483		-0.007	-0.294	-0.007	-0.294	-0.007	-0.294
PROD1	-0.099	-1.1		-0.056	-0.371		1.624	3.37		1.624	3.37		0.66	1.276	0.66	1.276	0.66	1.276
GDP	-1.389	-7.46		-1.471	-4.729		-4.253	-5.015		-4.253	-5.015		-2.274	-2.045	-2.274	-2.045	-2.274	-2.045
FDEBT	0.296	4.593		0.298	3.861		-0.029	-0.201		-0.029	-0.201		0.147	0.844	0.147	0.844	0.147	0.844
OPEN1	0.299	6.38		0.308	5.357		0.274	2.514		0.274	2.514		0.101	0.605	0.101	0.605	0.101	0.605
leads+lags				0	0		2	2		2	2							

1992_eq2

	EG			dols_SIC			dols_AIC			dols_HQ			ardl_SIC		ardl_AIC		ardl_HQ	
SIC	0	-2.939	NO	0	-2.886	NO	0	-3.722	NO	0	-3.722	NO	2.495	NO	2.495	NO	2.495	NO
AIC	4	-3.96	NO	0	-2.886	NO	1	-4.513	5%	1	-4.513	5%	3	0	3	0	3	0
HQ	0%	-2.939	NO	0	-2.886	NO	1	-4.513	5%	1	-4.513	5%						
	coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat	coeff	t-stat	coeff	t-stat
CONST	0.031	3.728		0.03	3.278		0.027	2.862		0.027	2.862		0.019	0.937	0.019	0.937	0.019	0.937
GDP	-1.553	-13.943		-1.6	-11.432		-1.669	-8.463		-1.669	-8.463		-1.237	-2.017	-1.237	-2.017	-1.237	-2.017
OPEN1	0.287	6.281		0.31	5.359		0.428	5.834		0.428	5.834		0.162	1.098	0.162	1.098	0.162	1.098
FDEBT	0.272	4.476		0.272	4.115		0.302	3.76		0.302	3.76		0.164	1.186	0.164	1.186	0.164	1.186
leads+lags				0	0		3	0		3	0							

1992_eq3

	EG			dols_SIC			dols_AIC			dols_HQ			ardl_SIC		ardl_AIC		ardl_HQ	
SIC	0	-5.248	5%	1	-4.937	10%	1	-4.937	10%	1	-4.937	10%	2.769	AMB10%	2.769	AMB10%	2.769	AMB10%
AIC	0	-5.248	5%	1	-4.937	10%	1	-4.937	10%	1	-4.937	10%	1	0	1	0	1	0
HQ	0	-5.248	5%	1	-4.937	10%	1	-4.937	10%	1	-4.937	10%						
	coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat	coeff	t-stat	coeff	t-stat
CONST	0.037	3.316		0.03	2.166		0.03	2.166		0.03	2.166		0.027	1.028	0.027	1.028	0.027	1.028
PROD1	-1.016	-12.056		-1.068	-10.944		-1.068	-10.944		-1.068	-10.944		-1.072	-2.789	-1.072	-2.789	-1.072	-2.789
INTCPI	-0.003	-2.902		-0.002	-1.994		-0.002	-1.994		-0.002	-1.994		0.001	0.419	0.001	0.419	0.001	0.419
GOV	1.295	4.257		1.496	4.179		1.496	4.179		1.496	4.179		1.257	1.527	1.257	1.527	1.257	1.527
FDEBT	0.423	7.618		0.405	6.162		0.405	6.162		0.405	6.162		0.347	1.993	0.347	1.993	0.347	1.993
OPEN1	0.306	7.449		0.306	5.955		0.306	5.955		0.306	5.955		0.288	2.058	0.288	2.058	0.288	2.058
TOT2	0.777	2.995		0.644	1.739		0.644	1.739		0.644	1.739		0.196	0.269	0.196	0.269	0.196	0.269
leads+lags				0	0		0	0		0	0							

1992_eq4

	EG			dols_SIC			dols_AIC			dols_HQ			ardl_SIC		ardl_AIC		ardl_HQ	
SIC	0	-5.564	5%	1	-4.899	10%	1	-4.899	10%	1	-4.899	10%	3.253	AMB10%	3.253	AMB10%	3.253	AMB10%
AIC	0	-5.564	5%	1	-4.899	10%	1	-4.899	10%	1	-4.899	10%	1	0	1	0	1	0
HQ	0	-5.564	5%	1	-4.899	10%	1	-4.899	10%	1	-4.899	10%						
	coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat	coeff	t-stat	coeff	t-stat
CONST	0.013	1.52		0.015	1.347		0.015	1.347		0.015	1.347		0.022	1.031	0.022	1.031	0.022	1.031
PROD1	-1.14	-14.095		-1.137	-12.518		-1.137	-12.518		-1.137	-12.518		-1.103	-2.826	-1.103	-2.826	-1.103	-2.826
INTCPI	-0.003	-2.841		-0.002	-1.773		-0.002	-1.773		-0.002	-1.773		0.001	0.511	0.001	0.511	0.001	0.511
GOV	1.928	8.02		1.904	6.887		1.904	6.887		1.904	6.887		1.381	1.705	1.381	1.705	1.381	1.705
FDEBT	0.373	6.405		0.35	6.059		0.35	6.059		0.35	6.059		0.34	2.258	0.34	2.258	0.34	2.258
OPEN1	0.309	6.837		0.293	5.733		0.293	5.733		0.293	5.733		0.294	2.127	0.294	2.127	0.294	2.127
leads+lags				0	0		0	0		0	0							

1992_eq5

	EG			dols_SIC			dols_AIC			dols_HQ			ardl_SIC		ardl_AIC		ardl_HQ	
SIC	0	-1.55	NO	0	-1.48	NO	0	-1.48	NO	0	-1.48	NO	1.362	NO	1.362	NO	1.362	NO
AIC	0	-1.55	NO	0	-1.48	NO	0	-1.48	NO	0	-1.48	NO	3	0	3	0	3	0
HQ	0	-1.55	NO	0	-1.48	NO	0	-1.48	NO	0	-1.48	NO						
	coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat	coeff	t-stat	coeff	t-stat
CONST	0.058	5.462		0.056	4.143		0.056	4.143		0.056	4.143		0.03	0.37	0.03	0.37	0.03	0.37
PROD1	-0.439	-12.24		-0.447	-11.446		-0.447	-11.446		-0.447	-11.446		-0.704	-1.907	-0.704	-1.907	-0.704	-1.907
FDEBT	0.469	4.927		0.462	4.54		0.462	4.54		0.462	4.54		0.139	0.276	0.139	0.276	0.139	0.276
leads+lags				0	0		0	0		0	0							

Hungary, 1993-2002

1993_eq1

	EG			dols_SIC			dols_AIC			dols_HQ			ardl_SIC		ardl_AIC		ardl_HQ	
SIC	0	-1.319	NO	1	-2.247	NO	2	-3.043	NO	2	-3.043	NO	1.447	NO	3.065	NO	3.065	NO
AIC	0	-1.319	NO	1	-2.247	NO	2	-3.043	NO	2	-3.043	NO	1	0	2	1	2	1
HQ	0	-1.319	NO	1	-2.247	NO	2	-3.043	NO	2	-3.043	NO						
	coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat	coeff	t-stat	coeff	t-stat
CONST	0.046	3.206		0.045	3.126		0.041	2.736		0.041	2.736		0.073	0.329	0.074	0.986	0.074	0.986
PROD3	-0.856	-7.975		-1.001	-9.43		-0.983	-7.93		-0.983	-7.93		-3.986	-1.649	-2.319	-2.768	-2.319	-2.768
FDEBT	0.546	4.593		0.425	2.948		0.303	1.712		0.303	1.712		-0.402	-0.205	0.058	0.084	0.058	0.084
leads+lags				1	3		3	3		3	3							

1993_eq2

	EG			dols_SIC			dols_AIC			dols_HQ			ardl_SIC		ardl_AIC		ardl_HQ	
SIC	0	-2.135	NO	0	-3.708	NO	0	-3.708	NO	0	-3.708	NO	3.003	AMB10%	3.923	10%	3.923	10%
AIC	0	-2.135	NO	4	-4.235	10%	4	-4.235	10%	4	-4.235	10%	1	0	1	1	1	1
HQ	0%	-2.135	NO	4	-4.235	10%	4	-4.235	10%	4	-4.235	10%						
	coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat	coeff	t-stat	coeff	t-stat
CONST	0.077	5.395		0.104	5.051		0.104	5.051		0.104	5.051		0.124	2.006	0.106	2.546	0.106	2.546
PROD3	-0.659	-6.437		1.031	1.048		1.031	1.048		1.031	1.048		-0.757	-1.473	-0.668	-2.107	-0.668	-2.107
FDEBT	0.594	5.912		1.726	2.455		1.726	2.455		1.726	2.455		0.642	1.318	0.613	1.919	0.613	1.919
TOT2	2.032	4.069		10.423	2.593		10.423	2.593		10.423	2.593		6.253	2.706	5.29	3.354	5.29	3.354
leads+lags				3	3		3	3		3	3							

1993_eq3

	EG			dols_SIC			dols_AIC			dols_HQ			ardl_SIC		ardl_AIC		ardl_HQ	
SIC	0	-4.805	5%	0	-5.129	5%	0	-5.129	5%	0	-5.129	5%	2.754	AMB10%	2.754	AMB10%	2.754	AMB10%
AIC	0	-4.805	5%	0	-5.129	5%	0	-5.129	5%	0	-5.129	5%	1	0	1	0	1	0
HQ	0	-4.805	5%	0	-5.129	5%	0	-5.129	5%	0	-5.129	5%						
	coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat	coeff	t-stat	coeff	t-stat
CONST	0.016	1.77		0.204	3.616		0.204	3.616		0.204	3.616		0.019	0.834	0.019	0.834	0.019	0.834
PROD1	-1.159	-14.665		-0.503	-1.6		-0.503	-1.6		-0.503	-1.6		-0.97	-2.081	-0.97	-2.081	-0.97	-2.081
FDEBT	0.409	7.108		-0.316	-1.532		-0.316	-1.532		-0.316	-1.532		0.255	1.324	0.255	1.324	0.255	1.324
GOV	1.538	5.895		3.146	8.718		3.146	8.718		3.146	8.718		1.831	2.021	1.831	2.021	1.831	2.021
OPEN1	0.364	7.441		-0.423	-1.637		-0.423	-1.637		-0.423	-1.637		0.151	0.816	0.151	0.816	0.151	0.816
leads+lags				2	2		2	2		2	2							

1993_eq4

	EG			dols_SIC			dols_AIC			dols_HQ			ardl_SIC		ardl_AIC		ardl_HQ	
SIC	0	-5.036	5%	1	-5.073	5%	0	-5.393	5%	0	-5.393	5%	2.742	AMB10%	2.742	AMB10%	2.742	AMB10%
AIC	0	-5.036	5%	1	-5.073	5%	0	-5.393	5%	0	-5.393	5%	1	0	1	0	1	0
HQ	0	-5.036	5%	1	-5.073	5%	0	-5.393	5%	0	-5.393	5%						
	coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat	coeff	t-stat	coeff	t-stat
CONST	0.014	1.431		0.01	0.847		0.119	1.789		0.119	1.789		0.021	0.853	0.021	0.853	0.021	0.853
PROD2	-1.156	-13.642		-1.109	-10.982		-0.969	-2.426		-0.969	-2.426		-0.963	-2.082	-0.963	-2.082	-0.963	-2.082
FDEBT	0.397	6.475		0.356	5.549		-0.062	-0.245		-0.062	-0.245		0.228	1.208	0.228	1.208	0.228	1.208
GOV	1.363	5.019		1.601	5.853		3.041	6.453		3.041	6.453		1.778	2.111	1.778	2.111	1.778	2.111
OPEN1	0.368	6.986		0.299	4.41		-0.028	-0.086		-0.028	-0.086		0.141	0.76	0.141	0.76	0.141	0.76
leads+lags				0	0		2	2		2	2							

1993_eq5

	EG			dols_SIC			dols_AIC			dols_HQ			ardl_SIC		ardl_AIC		ardl_HQ	
SIC	0	-4.146	NO	0	-4.536	10%	0	-6.974	5%	0	-6.974	5%	3.536	10%	3.536	10%	3.536	10%
AIC	0	-4.146	NO	3	-3.103	NO	4	-5.26	5%	4	-5.26	5%	1	0	1	0	1	0
HQ	0	-4.146	NO	0	-4.536	10%	4	-5.26	5%	4	-5.26	5%						
	coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat	coeff	t-stat	coeff	t-stat
CONST	0.004	0.524		0.02	1.235		0.059	1.018		0.059	1.018		0.021	1.158	0.021	1.158	0.021	1.158
GDP	-1.723	-18.457		-1.752	-14.644		-1.499	-3.643		-1.499	-3.643		-1.52	-2.532	-1.52	-2.532	-1.52	-2.532
FDEBT	0.248	5.05		0.143	2.173		-0.021	-0.141		-0.021	-0.141		0.102	0.868	0.102	0.868	0.102	0.868
GOV	0.952	4.846		1.417	6.899		2.073	3.839		2.073	3.839		1.405	2.572	1.405	2.572	1.405	2.572
OPEN1	0.279	7.841		0.257	5.082		0.048	0.258		0.048	0.258		0.136	1.173	0.136	1.173	0.136	1.173
leads+lags				1	0		2	2		2	2							

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1994_eq1

	EG			dols_SIC			dols_AIC			dols_HQ			ardl_SIC		ardl_AIC		ardl_HQ	
SIC	0	-3.997	NO	1	-7.302	5%	1	-7.302	5%	1	-7.302	5%	3.186	AMB10 %	3.186	AMB10 %	3.186	AMB10 %
AIC	0	-3.997	NO	3	-4.882	5%	3	-4.882	5%	3	-4.882	5%	1	0	1	0	1	0
HQ	0	-3.997	NO	3	-4.882	5%	3	-4.882	5%	3	-4.882	5%						
	coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat	coeff	t-stat	coeff	t-stat
CONST	-0.001	-0.089		0.336	2.205		0.336	2.205		0.336	2.205		0.045	1.152	0.045	1.152	0.045	1.152
GDP	-1.74	-16.779		-0.66	-1.05		-0.66	-1.05		-0.66	-1.05		-1.476	-1.938	-1.476	-1.938	-1.476	-1.938
FDEBT	0.261	5.09		-0.426	-1.654		-0.426	-1.654		-0.426	-1.654		0.074	0.514	0.074	0.514	0.074	0.514
GOV	1.1	3.572		-1.61	-0.82		-1.61	-0.82		-1.61	-0.82		1.017	1.018	1.017	1.018	1.017	1.018
OPEN1	0.279	7.421		-0.244	-0.962		-0.244	-0.962		-0.244	-0.962		0.122	0.841	0.122	0.841	0.122	0.841
leads+lags				2	2		2	2		2	2							

1994_eq2

	EG			dols_SIC			dols_AIC			dols_HQ			ardl_SIC		ardl_AIC		ardl_HQ	
SIC	0	-5.129	10%	0	-4.498	NO	0	-4.63	NO	0	-4.498	NO	3.028	AMB10 %	3.028	AMB10 %	3.028	AMB10 %
AIC	0	-5.129	10%	1	-4.265	NO	0	-4.63	NO	1	-4.265	NO	1	0	1	0	1	0
HQ	0%	-5.129	10%	1	-4.265	NO	0	-4.63	NO	1	-4.265	NO						
	coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat	coeff	t-stat	coeff	t-stat
CONST	0.01	0.786		0.026	1.436		0.005	0.185		0.026	1.436		0.055	1.488	0.055	1.488	0.055	1.488
GDP	-1.523	-13.374		-1.416	-9.678		-1.588	-7.846		-1.416	-9.678		-1.256	-1.753	-1.256	-1.753	-1.256	-1.753
FDEBT	0.346	6.591		0.288	3.519		0.328	2.387		0.288	3.519		0.235	1.362	0.235	1.362	0.235	1.362
GOV	0.955	3.475		1.091	3.19		1.288	2.765		1.091	3.19		0.711	0.762	0.711	0.762	0.711	0.762
OPEN1	0.262	7.822		0.193	4.107		0.271	4.693		0.193	4.107		0.127	0.935	0.127	0.935	0.127	0.935
TOT2	0.984	3.169		1.141	2.771		1.015	1.474		1.141	2.771		1.195	1.648	1.195	1.648	1.195	1.648
leads+lags				0	0		1	0		0	0							

1994_eq3

	EG			dols_SIC			dols_AIC			dols_HQ			ardl_SIC		ardl_AIC		ardl_HQ	
SIC	0	-4.584	10%	1	-7.261	5%	1	-7.261	5%	1	-7.261	5%	2.263	NO	2.263	NO	2.263	NO
AIC	0	-4.584	10%	2	-5.602	5%	2	-5.602	5%	2	-5.602	5%	1	0	1	0	1	0
HQ	0	-4.584	10%	2	-5.602	5%	2	-5.602	5%	2	-5.602	5%						
	coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat	coeff	t-stat	coeff	t-stat
CONST	0.013	0.745		0.041	0.393		0.041	0.393		0.041	0.393		0.061	0.978	0.061	0.978	0.061	0.978
PROD1	-1.171	-13.222		-0.788	-2.595		-0.788	-2.595		-0.788	-2.595		-0.849	-1.253	-0.849	-1.253	-0.849	-1.253
FDEBT	0.414	6.758		-0.047	-0.194		-0.047	-0.194		-0.047	-0.194		0.198	0.726	0.198	0.726	0.198	0.726
GOV	1.648	4.051		5.829	4.354		5.829	4.354		5.829	4.354		1.04	0.562	1.04	0.562	1.04	0.562
OPEN1	0.366	6.978		-0.252	-1.05		-0.252	-1.05		-0.252	-1.05		0.074	0.285	0.074	0.285	0.074	0.285
leads+lags				2	2		2	2		2	2							

1994_eq4

	EG			dols_SIC			dols_AIC			dols_HQ			ardl_SIC		ardl_AIC		ardl_HQ	
SIC	0	-4.701	NO	1	-4.754	NO	0	-3.999	NO	1	-4.754	NO	2.333	AMB10 %	2.333	AMB10 %	2.333	AMB10 %
AIC	0	-4.701	NO	1	-4.754	NO	0	-3.999	NO	1	-4.754	NO	1	0	1	0	1	0
HQ	0	-4.701	NO	1	-4.754	NO	0	-3.999	NO	1	-4.754	NO						
	coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat	coeff	t-stat	coeff	t-stat
CONST	0.023	1.346		0.015	0.686		0.012	0.36		0.015	0.686		0.089	1.505	0.089	1.505	0.089	1.505
PROD1	-1.026	-9.36		-0.945	-7.476		-1.02	-5.939		-0.945	-7.476		-0.579	-0.933	-0.579	-0.933	-0.579	-0.933
FDEBT	0.475	7.267		0.471	6.568		0.536	5.593		0.471	6.568		0.405	1.45	0.405	1.45	0.405	1.45
GOV	1.418	3.521		1.711	3.623		1.804	2.753		1.711	3.623		0.295	0.174	0.295	0.174	0.295	0.174
OPEN1	0.335	6.408		0.266	3.966		0.348	4.127		0.266	3.966		0.06	0.258	0.06	0.258	0.06	0.258
TOT2	0.888	2.059		1.218	2.515		1.475	2.093		1.218	2.515		2.11	1.698	2.11	1.698	2.11	1.698
leads+lags				0	0		1	0		0	0							

1994_eq3BIS

	EG			dols_SIC			dols_AIC			dols_HQ			ardl_SIC		ardl_AIC		ardl_HQ	
SIC	0	-2.319	NO	2	-6.541	5%	2	-6.541	5%	2	-6.541	5%	1.927	NO	3.407	AMB10 %	3.407	AMB10 %
AIC	0	-2.319	NO	3	-5.336	5%	3	-5.336	5%	3	-5.336	5%	1	0	1	2	1	2
HQ	0	-2.319	NO	3	-5.336	5%	3	-5.336	5%	3	-5.336	5%						
	coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat	coeff	t-stat	coeff	t-stat
CONST	0.072	2.113		-0.064	-1.326		-0.064	-1.326		-0.064	-1.326		0.25	1.575	-0.002	-0.03	-0.002	-0.03
PROD3	-1.196	-3.878		-2.645	-8.042		-2.645	-8.042		-2.645	-8.042		-0.096	-0.072	-2.086	-3.052	-2.086	-3.052
FDEBT	0.53	4.068		1.18	6.141		1.18	6.141		1.18	6.141		-0.318	-0.588	0.676	2.282	0.676	2.282
GOV	-0.891	-1.261		-2.428	-2.292		-2.428	-2.292		-2.428	-2.292		-1.535	-0.499	-0.929	-1.259	-0.929	-1.259
OPEN1	0.161	1.416		0.964	4.569		0.964	4.569		0.964	4.569		-0.605	-1.321	0.497	1.995	0.497	1.995
leads+lags				2	2		2	2		2	2							

1994_eq5

	EG			dols_SIC			dols_AIC			dols_HQ			ardl_SIC		ardl_AIC		ardl_HQ	
SIC	0	-2.136	NO	1	-4.848	5%	1	-6.825	5%	1	-6.825	5%	3.466	AMB10 %	3.466	AMB10 %	3.466	AMB10 %
AIC	0	-2.136	NO	4	-4.834	5%	4	-4.69	5%	4	-4.69	5%	1	2	1	2	1	2
HQ	0	-2.136	NO	4	-4.834	5%	4	-4.69	5%	4	-4.69	5%						
	coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat	coeff	t-stat	coeff	t-stat
CONST	0.04	1.733		-0.052	-3.593		-0.047	-1.633		-0.047	-1.633		-0.031	-1.234	-0.031	-1.234	-0.031	-1.234
PROD3	-1.306	-4.37		-2.344	-12.02		-2.489	-7.493		-2.489	-7.493		-2.099	-3.164	-2.099	-3.164	-2.099	-3.164
FDEBT	0.553	4.25		0.811	9.482		0.908	6.795		0.908	6.795		0.622	2.551	0.622	2.551	0.622	2.551
OPEN1	0.148	1.296		0.59	6.855		0.633	4.052		0.633	4.052		0.434	2.346	0.434	2.346	0.434	2.346
leads+lags				1	3		2	3		2	3							

1994_eq6

	EG			dols_SIC			dols_AIC			dols_HQ			ardl_SIC		ardl_AIC		ardl_HQ	
SIC	0	-2.662	NO	0	-8.214	5%	0	-8.214	5%	0	-8.214	5%	2.429	NO	2.115	NO	2.115	NO
AIC	0	-2.662	NO	0	-8.214	5%	0	-8.214	5%	0	-8.214	5%	1	0	2	1	2	1
HQ	0	-2.662	NO	0	-8.214	5%	0	-8.214	5%	0	-8.214	5%						
	coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat	coeff	t-stat	coeff	t-stat
CONST	0.074	5.007		0.159	9.009		0.159	9.009		0.159	9.009		0.126	1.968	0.096	1.649	0.096	1.649
PROD3	-0.457	-2.817		1.935	3.146		1.935	3.146		1.935	3.146		-0.6	-1.048	-0.691	-1.226	-0.691	-1.226
FDEBT	0.666	5.992		2.361	5.516		2.361	5.516		2.361	5.516		0.705	1.37	0.698	1.374	0.698	1.374
TOT2	2.892	4.094		15.581	5.542		15.581	5.542		15.581	5.542		6.521	2.004	5.437	1.513	5.437	1.513
leads+lags				3	3		3	3		3	3							

1994_eq7

	EG			dols_SIC			dols_AIC			dols_HQ			ardl_SIC		ardl_AIC		ardl_HQ	
SIC	0	-1.436	NO	0	-2.075	NO	0	-2.476	NO	3	-5.482	5%	3.343	AMB10 %	3.343	AMB10 %	3.343	AMB10 %

AIC	0	-1.436	NO	0	-2.075	NO	4	-4.059	5%	3	-5.482	5%	1	1	1	1	1	1
HQ	0	-1.436	NO	0	-2.075	NO	4	-4.059	5%	3	-5.482	5%						
	coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat	Coeff	t-stat	coeff	t-stat
CONST	0.06	3.434		0.067	4.581		0.077	3.048		0.061	3.381		0.102	1.595	0.102	1.595	0.102	1.595
PROD3	-0.956	-7.356		-1.151	-10.915		-1.144	-9.047		-1.087	-9.544		-2.065	-3.001	-2.065	-3.001	-2.065	-3.001
FDEBT	0.509	4.011		0.305	2.535		0.345	1.515		0.277	1.75		0.029	0.062	0.029	0.062	0.029	0.062
leads+lags				1	2		3	3		3	2							

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1993_eq1

	EG			dols_SIC			dols_AIC			dols_HQ			ardl_SIC		ardl_AIC		ardl_HQ	
SIC	0	-3.552	NO	0	-4.134	5%	0	-6.486	5%	0	-6.486	5%	3.552	AMB10 %	5.533	5%	5.533	5%
AIC	0	-3.552	NO	0	-4.134	5%	0	-6.486	5%	0	-6.486	5%	1	0	3	0	3	0
HQ	0	-3.552	NO	0	-4.134	5%	0	-6.486	5%	0	-6.486	5%						
	coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat	coeff	t-stat	coeff	t-stat
CONST	-0.046	-3.51		-0.054	-4.1		-0.078	-3.665		-0.078	-3.665		-0.06	-2.382	-0.054	-2.463	-0.054	-2.463
PROD1	-0.836	-14.029		-0.893	-14.277		-1.056	-14.051		-1.056	-14.051		-0.83	-2.878	-0.808	-3.46	-0.808	-3.46
INTCPI	-0.008	-4.269		-0.009	-4.501		-0.007	-3.049		-0.007	-3.049		-0.008	-2.059	-0.008	-2.398	-0.008	-2.398
leads+lags				2	0		3	3		3	3							

1993_eq2

	EG			dols_SIC			dols_AIC			dols_HQ			ardl_SIC		ardl_AIC		ardl_HQ	
SIC	0	-3.458	NO	0	-3.262	NO	0	-4.608	5%	0	-4.608	5%	3.686	AMB10 %	3.686	AMB10 %	3.686	AMB10 %
AIC	0	-3.458	NO	0	-3.262	NO	0	-4.608	5%	0	-4.608	5%	1	0	1	0	1	0
HQ	0%	-3.458	NO	0	-3.262	NO	0	-4.608	5%	0	-4.608	5%						
	coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat	coeff	t-stat	coeff	t-stat
CONST	-0.032	-1.935		-0.036	-2.207		-0.049	-1.91		-0.049	-1.91		-0.047	-1.654	-0.047	-1.654	-0.047	-1.654
PROD2	-0.876	-11.923		-0.902	-12.29		-1.224	-12.782		-1.224	-12.782		-0.899	-2.952	-0.899	-2.952	-0.899	-2.952
INTCPI	-0.007	-3.319		-0.007	-3.293		0	-0.072		0	-0.072		-0.008	-1.781	-0.008	-1.781	-0.008	-1.781
leads+lags				0	0		2	3		2	3							

1993_eq3

	EG			dols_SIC			dols_AIC			dols_HQ			ardl_SIC		ardl_AIC		ardl_HQ	
SIC	0	-3.214	NO	0	-6.032	5%	0	-6.032	5%	0	-6.032	5%	2.541	NO	4.374	10%	4.374	10%
AIC	0	-3.214	NO	2	-4.814	5%	2	-4.814	5%	2	-4.814	5%	1	0	3	0	3	0
HQ	0	-3.214	NO	2	-4.814	5%	2	-4.814	5%	2	-4.814	5%						
	coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat	coeff	t-stat	coeff	t-stat
CONST	-0.065	-4.912		-0.085	-6.57		-0.085	-6.57		-0.085	-6.57		-0.084	-2.26	-0.078	-2.598	-0.078	-2.598
PROD3	-0.882	-12.656		-0.94	-15.69		-0.94	-15.69		-0.94	-15.69		-0.86	-2.449	-0.82	-3.049	-0.82	-3.049
INTCPI	-0.008	-4.214		-0.013	-7.115		-0.013	-7.115		-0.013	-7.115		-0.009	-1.617	-0.008	-1.935	-0.008	-1.935
leads+lags				3	3		3	3		3	3							

1993_eq4

	EG			dols_SIC			dols_AIC			dols_HQ			ardl_SIC		ardl_AIC		ardl_HQ	
SIC	0	-3.707	NO	0	-7.563	5%	0	-7.563	5%	0	-7.563	5%	4.878	5%	4.878	5%	4.878	5%
AIC	0	-3.707	NO	3	-5.382	5%	3	-5.382	5%	3	-5.382	5%	1	0	1	0	1	0
HQ	0	-3.707	NO	3	-5.382	5%	3	-5.382	5%	3	-5.382	5%						
	coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat	coeff	t-stat	coeff	t-stat
CONST	-0.028	-1.628		0.026	0.784		0.026	0.784		0.026	0.784		-0.001	-0.019	-0.001	-0.019	-0.001	-0.019
PROD1	-0.875	-13.756		-1.164	-10.369		-1.164	-10.369		-1.164	-10.369		-0.962	-3.847	-0.962	-3.847	-0.962	-3.847
INTCPI	-0.007	-3.524		-0.01	-2.276		-0.01	-2.276		-0.01	-2.276		-0.009	-2.633	-0.009	-2.633	-0.009	-2.633
FDEBT	0.08	1.543		0.367	3.22		0.367	3.22		0.367	3.22		0.22	2.552	0.22	2.552	0.22	2.552
leads+lags				2	3		2	3		2	3							

1993_eq5

	EG			dols_SIC			dols_AIC			dols_HQ			ardl_SIC		ardl_AIC		ardl_HQ	
SIC	0	-3.674	NO	2	-5.911	5%	2	-5.911	5%	2	-5.911	5%	4.634	5%	4.634	5%	4.634	5%
AIC	0	-3.674	NO	2	-5.911	5%	2	-5.911	5%	2	-5.911	5%	1	0	1	0	1	0
HQ	0	-3.674	NO	2	-5.911	5%	2	-5.911	5%	2	-5.911	5%						
	coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat	coeff	t-stat	coeff	t-stat
CONST	-0.026	-1.497		-0.021	-0.386		-0.021	-0.386		-0.021	-0.386		0.007	0.224	0.007	0.224	0.007	0.224
PROD3	-0.988	-13.67		-1.215	-6.748		-1.215	-6.748		-1.215	-6.748		-1.075	-3.757	-1.075	-3.757	-1.075	-3.757
INTCPI	-0.006	-2.892		-0.005	-0.7		-0.005	-0.7		-0.005	-0.7		-0.008	-2.109	-0.008	-2.109	-0.008	-2.109
FDEBT	0.165	3.005		0.322	1.465		0.322	1.465		0.322	1.465		0.338	3.234	0.338	3.234	0.338	3.234
leads+lags				3	3		3	3		3	3							

1993_eq6

	EG			dols_SIC			dols_AIC			dols_HQ			ardl_SIC		ardl_AIC		ardl_HQ	
SIC	0	-4.136	NO	0	-5.295	5%	2	-6.388	5%	2	-6.388	5%	5.977	5%	3.966	10%	5.977	5%
AIC	3	-4.088	NO	0	-5.295	5%	2	-6.388	5%	2	-6.388	5%	1	0	1	1	1	0
HQ	0	-4.136	NO	0	-5.295	5%	2	-6.388	5%	2	-6.388	5%						
	Coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat	coeff	t-stat	coeff	t-stat
CONST	-0.056	-3.052		-0.084	-5.005		-0.117	-4.293		-0.117	-4.293		-0.073	-2.123	-0.083	-1.978	-0.073	-2.123
PROD1	-1.1	-7.932		-1.342	-10.031		-1.565	-6.62		-1.565	-6.62		-1.731	-5.04	-1.62	-3.898	-1.731	-5.04
INTCPI	-0.009	-3.959		-0.012	-5.234		-0.017	-4.198		-0.017	-4.198		-0.009	-1.798	-0.011	-1.79	-0.009	-1.798
GOV	0.912	1.726		3.011	5.203		4.417	3.338		4.417	3.338		4.239	3.805	4.467	4.047	4.239	3.805
OPEN2	0.216	1.73		0.393	3.35		0.665	3.43		0.665	3.43		0.43	2.02	0.484	2.266	0.43	2.02
leads+lags				0	1		1	2		1	2							

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1994_eq1

	EG			dols_SIC			dols_AIC			dols_HQ			ardl_SIC		ardl_AIC		ardl_HQ	
SIC	0	-3.451	NO	0	-7.575	5%	0	-7.575	5%	0	-7.575	5%	3.543	AMB10 %	3.543	AMB10 %	3.543	AMB10 %
AIC	0	-3.451	NO	3	-4.768	5%	3	-4.768	5%	3	-4.768	5%	1	0	1	0	1	0
HQ	0	-3.451	NO	3	-4.768	5%	3	-4.768	5%	3	-4.768	5%						
	coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat	coeff	t-stat	coeff	t-stat
CONST	-0.01	-0.325		-0.026	-0.381		-0.026	-0.381		-0.026	-0.381		-0.017	-0.246	-0.017	-0.246	-0.017	-0.246
PROD1	-0.907	-10.63		-1.02	-6.571		-1.02	-6.571		-1.02	-6.571		-0.923	-2.843	-0.923	-2.843	-0.923	-2.843
INTCPI	-0.007	-3.154		-0.014	-2.688		-0.014	-2.688		-0.014	-2.688		-0.01	-2.329	-0.01	-2.329	-0.01	-2.329
FDEBT	0.14	1.64		0.299	1.474		0.299	1.474		0.299	1.474		0.181	0.948	0.181	0.948	0.181	0.948
leads+lags				2	3		2	3		2	3							

1994_eq2

	EG			dols_SIC			dols_AIC			dols_HQ			ardl_SIC		ardl_AIC		ardl_HQ	
SIC	0	-3.149	NO	1	-6.247	5%	1	-6.247	5%	1	-6.247	5%	2.647	NO	2.647	NO	2.647	NO
AIC	0	-3.149	NO	3	-4.916	5%	3	-4.916	5%	3	-4.916	5%	1	0	1	0	1	0
HQ	0%	-3.149	NO	3	-4.916	5%	3	-4.916	5%	3	-4.916	5%						
	coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat	coeff	t-stat	coeff	t-stat
CONST	-0.001	-0.032		0.087	1.176		0.087	1.176		0.087	1.176		-0.004	-0.037	-0.004	-0.037	-0.004	-0.037
PROD2	-0.942	-8.77		-1.408	-6.44		-1.408	-6.44		-1.408	-6.44		-0.998	-2.178	-0.998	-2.178	-0.998	-2.178
INTCPI	-0.007	-2.779		-0.009	-1.36		-0.009	-1.36		-0.009	-1.36		-0.01	-1.82	-0.01	-1.82	-0.01	-1.82
FDEBT	0.074	0.775		0.475	2.366		0.475	2.366		0.475	2.366		0.144	0.568	0.144	0.568	0.144	0.568
leads+lags				2	3		2	3		2	3							

1994_eq3

	EG			dols_SIC			dols_AIC			dols_HQ			ardl_SIC		ardl_AIC		ardl_HQ	
SIC	0	-3.71	NO	0	-6.328	5%	0	-6.328	5%	0	-6.328	5%	3.394	AMB10 %	3.394	AMB10 %	3.394	AMB10 %
AIC	0	-3.71	NO	2	-5.409	5%	2	-5.409	5%	2	-5.409	5%	1	0	1	0	1	0
HQ	0	-3.71	NO	2	-5.409	5%	2	-5.409	5%	2	-5.409	5%						
	coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat	coeff	t-stat	coeff	t-stat
CONST	-0.036	-1.295		-0.202	-4.314		-0.202	-4.314		-0.202	-4.314		-0.059	-1.01	-0.059	-1.01	-0.059	-1.01
PROD1	-0.676	-5.668		-0.954	-5.883		-0.954	-5.883		-0.954	-5.883		-0.755	-2.753	-0.755	-2.753	-0.755	-2.753
INTCPI	-0.01	-4.074		-0.015	-4.717		-0.015	-4.717		-0.015	-4.717		-0.012	-2.621	-0.012	-2.621	-0.012	-2.621
REGD	-0.212	-2.328		0.105	0.645		0.105	0.645		0.105	0.645		-0.187	-1.151	-0.187	-1.151	-0.187	-1.151
OPEN2	0.435	2.835		0.29	1.557		0.29	1.557		0.29	1.557		0.49	1.98	0.49	1.98	0.49	1.98
leads+lags				2	0		2	0		2	0							

1994_eq4

	EG			dols_SIC			dols_AIC			dols_HQ			ardl_SIC		ardl_AIC		ardl_HQ	
SIC	0	-3.444	NO	2	-5.591	5%	3	-5.953	5%	2	-5.591	5%	2.314	NO	2.314	NO	2.314	NO
AIC	0	-3.444	NO	2	-5.591	5%	3	-5.953	5%	2	-5.591	5%	1	0	1	0	1	0
HQ	0	-3.444	NO	2	-5.591	5%	3	-5.953	5%	2	-5.591	5%						
	coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat	coeff	t-stat	coeff	t-stat
CONST	-0.011	-0.386		-0.241	-6.282		-0.164	-2.127		-0.241	-6.282		-0.028	-0.389	-0.028	-0.389	-0.028	-0.389
PROD2	-0.707	-4.412		-1.502	-7.188		-0.803	-1.088		-1.502	-7.188		-0.805	-1.904	-0.805	-1.904	-0.805	-1.904
INTCPI	-0.01	-3.585		-0.019	-6.035		-0.017	-1.507		-0.019	-6.035		-0.011	-1.92	-0.011	-1.92	-0.011	-1.92
REGD	-0.242	-2.281		0.444	2.835		-0.298	-0.531		0.444	2.835		-0.229	-1.018	-0.229	-1.018	-0.229	-1.018
OPEN2	0.481	2.816		0.162	0.88		1.275	2.108		0.162	0.88		0.542	1.646	0.542	1.646	0.542	1.646
leads+lags				2	0		2	2		2	0							

1994_eq5

	EG			dols_SIC			dols_AIC			dols_HQ			ardl_SIC		ardl_AIC		ardl_HQ	
SIC	0	-4.126	NO	0	-5.401	5%	0	-5.875	5%	0	-5.875	5%	2.82	AMB10 %	2.82	AMB10 %	2.82	AMB10 %
AIC	0	-4.126	NO	0	-5.401	5%	2	-5.441	5%	2	-5.441	5%	1	0	1	0	1	0
HQ	0	-4.126	NO	0	-5.401	5%	2	-5.441	5%	2	-5.441	5%						
	coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat	coeff	t-stat	coeff	t-stat
CONST	-0.027	-0.926		-0.038	-0.945		0.003	0.049		0.003	0.049		-0.018	-0.188	-0.018	-0.188	-0.018	-0.188
PROD3	-1.132	-11.79		-1.151	-11.67		-1.18	-10.431		-1.18	-10.431		-1.176	-2.978	-1.176	-2.978	-1.176	-2.978
INTCPI	-0.01	-4.033		-0.009	-3.6		-0.011	-3.129		-0.011	-3.129		-0.008	-1.296	-0.008	-1.296	-0.008	-1.296
FDEBT	0.29	3.54		0.312	3.239		0.417	3.066		0.417	3.066		0.368	1.681	0.368	1.681	0.368	1.681
TOT2	-0.525	-1.916		-0.224	-0.707		-0.939	-2.294		-0.939	-2.294		0.154	0.256	0.154	0.256	0.154	0.256
OPEN2	0.282	2.369		0.288	2.025		0.25	1.308		0.25	1.308		0.205	0.727	0.205	0.727	0.205	0.727
leads+lags				0	0		1	0		1	0							

1994_eq6

	EG			dols_SIC			dols_AIC			dols_HQ			ardl_SIC		ardl_AIC		ardl_HQ	
SIC	0	-3.618	NO	0	-5.015	5%	2	-8.343	5%	0	-5.015	5%	3.64	10%	3.64	10%	3.64	10%
AIC	0	-3.618	NO	0	-5.015	5%	3	-5.501	5%	0	-5.015	5%	1	0	1	0	1	0
HQ	0	-3.618	NO	0	-5.015	5%	3	-5.501	5%	0	-5.015	5%						
	coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat	coeff	t-stat	coeff	t-stat
CONST	-0.029	-0.934		-0.045	-1.144		0.053	0.226		-0.045	-1.144		-0.02	-0.237	-0.02	-0.237	-0.02	-0.237
PROD3	-1.125	-11.246		-1.152	-11.97		-1.484	-4.868		-1.152	-11.97		-1.168	-3.658	-1.168	-3.658	-1.168	-3.658
INTCPI	-0.009	-3.635		-0.009	-3.729		-0.001	-0.078		-0.009	-3.729		-0.009	-1.563	-0.009	-1.563	-0.009	-1.563
FDEBT	0.265	3.142		0.303	3.274		0.56	1.322		0.303	3.274		0.364	1.994	0.364	1.994	0.364	1.994
OPEN2	0.234	1.927		0.295	2.131		0.172	0.202		0.295	2.131		0.22	0.861	0.22	0.861	0.22	0.861
leads+lags				0	0		2	2		0	0							

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1993_eq1	Eq1																	
	EG			dols_SIC			dols_AIC			dols_HQ			ardl_SIC		ardl_AIC		ardl_HQ	
SIC	1	-3.71	10%	2	-3.851	10%	2	-3.851	10%	2	-3.851	10%	5.686	5%	5.686	5%	5.686	5%
AIC	2	-3.718	10%	2	-3.851	10%	2	-3.851	10%	2	-3.851	10%	2	0	2	0	2	0
HQ	1	-3.71	10%	2	-3.851	10%	2	-3.851	10%	2	-3.851	10%						
	coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat	coeff	t-stat	coeff	t-stat
CONST	0.007	0.685		0.007	0.518		0.007	0.518		0.007	0.518		0.025	1.311	0.025	1.311	0.025	1.311
GDP	-0.602	-5.58		-0.61	-5.361		-0.61	-5.361		-0.61	-5.361		-0.655	-2.863	-0.655	-2.863	-0.655	-2.863
REGD	-0.343	-5.571		-0.346	-5.389		-0.346	-5.389		-0.346	-5.389		-0.333	-3.247	-0.333	-3.247	-0.333	-3.247
leads+lags				0	0		0	0		0	0							

1993_eq2																		
	EG			dols_SIC			dols_AIC			dols_HQ			ardl_SIC		ardl_AIC		ardl_HQ	
SIC	0	-2.81	NO	0	-3.462	NO	0	-3.227	NO	1	-4.429	5%	4.624	10%	5.01	5%	3.891	AMB10%
AIC	1	-3.383	NO	0	-3.462	NO	2	-4.177	5%	1	-4.429	5%	2	0	2	3	1	2
HQ	100%	-3.383	NO	0	-3.462	NO	2	-4.177	5%	1	-4.429	5%						
	coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat	coeff	t-stat	coeff	t-stat
CONST	0.064	5.553		0.071	5.518		0.088	3.706		0.113	6.376		0.075	2.149	0.11	2.924	0.123	2.908
GDP	-1.337	-25.118		-1.372	-25.39		-1.437	-23.263		-1.458	-26.622		-1.37	-3.145	-1.457	-3.493	-1.465	-3.117
INTCPI	0.005	5.768		0.006	6.212		0.003	3.085		0.006	6.365		0.006	3.313	0.006	3.637	0.007	3.222
leads+lags				0	0		3	1		0	2							

1993_eq3																		
	EG			dols_SIC			dols_AIC			dols_HQ			ardl_SIC		ardl_AIC		ardl_HQ	
SIC	1	-3.223	NO	4	-5.28	5%	4	-5.28	5%	4	-5.28	5%	3.4	AMB10%	3.4	AMB10%	3.4	AMB10%
AIC	2	-3.694	NO	4	-5.28	5%	4	-5.28	5%	4	-5.28	5%	2	0	2	0	2	0
HQ	2	-3.694	NO	4	-5.28	5%	4	-5.28	5%	4	-5.28	5%						
	coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat	coeff	t-stat	coeff	t-stat
CONST	0.007	0.686		-0.061	-3.335		-0.061	-3.335		-0.061	-3.335		0.01	0.421	0.01	0.421	0.01	0.421
REGD	-0.353	-4.33		-0.836	-9.547		-0.836	-9.547		-0.836	-9.547		-0.32	-1.967	-0.32	-1.967	-0.32	-1.967
GOV	-0.779	-1.857		1.77	3.043		1.77	3.043		1.77	3.043		-1.369	-1.897	-1.369	-1.897	-1.369	-1.897
FDEBT	-0.077	-1.653		-0.291	-4.406		-0.291	-4.406		-0.291	-4.406		0.018	0.206	0.018	0.206	0.018	0.206
leads+lags				1	2		1	2		1	2							

1993_eq4																		
	EG			dols_SIC			dols_AIC			dols_HQ			ardl_SIC		ardl_AIC		ardl_HQ	
SIC	0	-3.725	NO	1	-5.219	5%	0	-4.505	10%	0	-4.505	10%	1.864	NO	1.864	NO	1.864	NO
AIC	2	-3.934	NO	4	-4.494	10%	2	-4.747	10%	2	-4.747	10%	1	0	1	0	1	0
HQ	0	-3.725	NO	1	-5.219	5%	2	-4.747	10%	2	-4.747	10%						
	coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat	coeff	t-stat	coeff	t-stat
CONST	0.023	2.364		0.014	1.027		-0.005	-0.323		-0.005	-0.323		0.029	1.1	0.029	1.1	0.029	1.1
PROD3	0.526	4.141		0.835	4.731		0.688	3.255		0.688	3.255		0.492	1.195	0.492	1.195	0.492	1.195
REGD	-0.438	-6.191		-0.581	-8.182		-0.604	-7.462		-0.604	-7.462		-0.37	-1.49	-0.37	-1.49	-0.37	-1.49
FDEBT	-0.069	-1.781		-0.127	-2.839		-0.149	-2.766		-0.149	-2.766		0.019	0.194	0.019	0.194	0.019	0.194
GOV	-0.647	-1.849		-0.012	-0.032		0.139	0.312		0.139	0.312		-1.373	-1.877	-1.373	-1.877	-1.373	-1.877
leads+lags				1	0		1	1		1	1							

1993_eq5																		
	EG			dols_SIC			dols_AIC			dols_HQ			ardl_SIC		ardl_AIC		ardl_HQ	
SIC	2	-4.113	5%	2	-4.014	5%	2	-4.014	5%	2	-4.014	5%	4.654	10%	4.654	10%	4.654	10%
AIC	2	-4.113	5%	2	-4.014	5%	2	-4.014	5%	2	-4.014	5%	2	0	2	0	2	0
HQ	2	-4.113	5%	2	-4.014	5%	2	-4.014	5%	2	-4.014	5%						
	coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat	coeff	t-stat	coeff	t-stat
CONST	0.01	0.879		0.008	0.493		0.008	0.493		0.008	0.493		0.01	0.462	0.01	0.462	0.01	0.462
REGD	-0.31	-3.922		-0.318	-3.78		-0.318	-3.78		-0.318	-3.78		-0.303	-2.512	-0.303	-2.512	-0.303	-2.512
GOV	-1.305	-4.667		-1.284	-4.307		-1.284	-4.307		-1.284	-4.307		-1.312	-2.255	-1.312	-2.255	-1.312	-2.255
leads+lags				0	0		0	0		0	0							

1993_eq6																		
	EG			dols_SIC			dols_AIC			dols_HQ			ardl_SIC		ardl_AIC		ardl_HQ	
SIC	0	-5.026	5%	0	-5.027	5%	4	-6.56	5%	4	-6.56	5%	4.448	5%	6.434	5%	6.434	5%
AIC	0	-5.026	5%	0	-5.027	5%	4	-6.56	5%	4	-6.56	5%	1	0	1	1	1	1
HQ	0	-5.026	5%	0	-5.027	5%	4	-6.56	5%	4	-6.56	5%						
	coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat	coeff	t-stat	coeff	t-stat
CONST	0.073	4.451		0.101	5.509		0.128	5.2		0.128	5.2		0.095	3.17	0.108	3.775	0.108	3.775
PROD3	0.594	5.66		0.764	5.919		0.862	5.004		0.862	5.004		0.607	2.413	0.64	2.665	0.64	2.665
INTCPI	0.004	3.412		0.007	4.711		0.01	5.047		0.01	5.047		0.006	2.625	0.008	3.849	0.008	3.849
GDP	-1.096	-5.967		-1.372	-6.937		-1.79	-6.867		-1.79	-6.867		-1.298	-3.627	-1.514	-4.502	-1.514	-4.502
REGD	-0.172	-1.976		-0.066	-0.712		0.113	0.945		0.113	0.945		-0.094	-0.779	0	0.001	0	0.001
leads+lags				0	0		1	1		1	1							

1993_eq7																		
	EG			dols_SIC			dols_AIC			dols_HQ			ardl_SIC		ardl_AIC		ardl_HQ	
SIC	1	-4.037	10%	2	-4.18	10%	2	-4.18	10%	2	-4.18	10%	3.54	AMB10%	5.263	5%	5.263	5%
AIC	2	-4.129	10%	2	-4.18	10%	2	-4.18	10%	2	-4.18	10%	2	0	2	1	2	1
HQ	2	-4.129	10%	2	-4.18	10%	2	-4.18	10%	2	-4.18	10%						
	coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat	coeff	t-stat	coeff	t-stat
CONST	0.012	1.083		-0.008	-0.497		-0.008	-0.497		-0.008	-0.497		0.01	0.453	0.007	0.372	0.007	0.372
PROD2	0.29	1.93		0.827	4.282		0.827	4.282		0.827	4.282		0.273	0.888	0.546	1.849	0.546	1.849
REGD	-0.472	-4.162		-0.815	-6.044		-0.815	-6.044		-0.815	-6.044		-0.463	-2.011	-0.628	-2.878	-0.628	-2.878
GOV	-1.097	-3.772		-0.608	-1.981		-0.608	-1.981		-0.608	-1.981		-1.121	-1.909	-0.867	-1.899	-0.867	-1.899
leads+lags				0	1		0	1		0	1							

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1994_eq1	Eq1																	
	EG			dols_SIC			dols_AIC			dols_HQ			ardl_SIC		ardl_AIC		ardl_HQ	
SIC	0	-2.442	NO	1	-5.339	5%	1	-5.339	5%	1	-5.339	5%	8.64	5%	8.64	5%	8.64	5%
AIC	1	-2.892	NO	1	-5.339	5%	1	-5.339	5%	1	-5.339	5%	2	3	2	3	2	3
HQ	1	-2.892	NO	1	-5.339	5%	1	-5.339	5%	1	-5.339	5%						
	coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat	coeff	t-stat	coeff	t-stat
CONST	0.063	5.029		0.176	6.325		0.176	6.325		0.176	6.325		0.132	4.29	0.132	4.29	0.132	4.29
GDP	-1.336	-23.363		-1.633	-24.816		-1.633	-24.816		-1.633	-24.816		-1.514	-4.863	-1.514	-4.863	-1.514	-4.863
INTCPI	0.006	4.929		0.002	1.714		0.002	1.714		0.002	1.714		0.005	4.142	0.005	4.142	0.005	4.142
leads+lags				2	3		2	3		2	3							

1994_eq2																		
	EG			dols_SIC			dols_AIC			dols_HQ			ardl_SIC		ardl_AIC		ardl_HQ	
SIC	0	-2.832	NO	0	-3.25	NO	2	-4.225	10%	2	-4.225	10%	3.544	AMB10%	4.129	10%	3.544	AMB10%
AIC	0	-2.832	NO	2	-3.91	NO	2	-4.225	10%	2	-4.225	10%	2	0	2	2	2	0
HQ	0%	-2.832	NO	0	-3.25	NO	2	-4.225	10%	2	-4.225	10%						
	coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat	coeff	t-stat	coeff	t-stat
CONST	0.052	4.003		0.087	4.458		0.173	2.873		0.173	2.873		0.067	2.55	0.104	3.496	0.067	2.55
GDP	-1.075	-7.892		-1.21	-5.898		-1.119	-1.722		-1.119	-1.722		-0.928	-3.134	-1.041	-2.911	-0.928	-3.134
INTCPI	0.004	2.746		0.003	1.631		-0.001	-0.233		-0.001	-0.233		0.001	0.486	0.001	0.56	0.001	0.486
OPEN1	-0.222	-2.091		-0.157	-0.978		-0.385	-0.805		-0.385	-0.805		-0.378	-2.057	-0.332	-1.603	-0.378	-2.057
leads+lags				1	0		2	2		2	2							

1994_eq3																		
	EG			dols_SIC			dols_AIC			dols_HQ			ardl_SIC		ardl_AIC		ardl_HQ	
SIC	1	-3.157	NO	2	-4.923	5%	0	-4.388	NO	0	-4.388	NO	1.945	NO	1.945	NO	1.945	NO
AIC	1	-3.157	NO	2	-4.923	5%	2	-5.203	5%	2	-5.203	5%	1	0	1	0	1	0
HQ	1	-3.157	NO	2	-4.923	5%	2	-5.203	5%	2	-5.203	5%						
	coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat	coeff	t-stat	coeff	t-stat
CONST	0.011	0.791		0.002	0.071		-0.004	-0.141		-0.004	-0.141		0.069	1.305	0.069	1.305	0.069	1.305
GDP	-0.662	-2.031		-0.071	-0.176		0.011	0.026		0.011	0.026		-1.134	-1.224	-1.134	-1.224	-1.134	-1.224
REG	-0.394	-4.606		-0.565	-6.475		-0.694	-7.334		-0.694	-7.334		-0.271	-0.907	-0.271	-0.907	-0.271	-0.907
FDEBT	-0.051	-1.075		-0.262	-3.842		-0.264	-3.221		-0.264	-3.221		0.15	0.909	0.15	0.909	0.15	0.909
GOV	0.855	1.169		1.363	1.599		1.699	1.797		1.699	1.797		0.026	0.013	0.026	0.013	0.026	0.013
leads+lags				1	0		1	1		1	1							

1994_eq4																		
	EG			dols_SIC			dols_AIC			dols_HQ			ardl_SIC		ardl_AIC		ardl_HQ	
SIC	1	-3.504	NO	0	-2.893	NO	0	-2.893	NO	0	-2.893	NO	4.626	5%	4.543	5%	4.626	5%
AIC	1	-3.504	NO	2	-4.016	NO	2	-4.016	NO	2	-4.016	NO	2	0	2	2	2	0
HQ	1	-3.504	NO	2	-4.016	NO	2	-4.016	NO	2	-4.016	NO						
	coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat	coeff	t-stat	coeff	t-stat
CONST	0.016	1.195		0.023	1.074		0.023	1.074		0.023	1.074		0.05	1.858	0.095	2.825	0.05	1.858
GDP	-0.829	-2.626		-1.004	-2.766		-1.004	-2.766		-1.004	-2.766		-0.611	-1.307	-0.788	-1.46	-0.611	-1.307
REGD	-0.342	-4.387		-0.357	-4.209		-0.357	-4.209		-0.357	-4.209		-0.263	-2.579	-0.279	-2.315	-0.263	-2.579
GOV	0.368	0.537		0.714	0.899		0.714	0.899		0.714	0.899		-0.417	-0.467	-0.111	-0.103	-0.417	-0.467
leads+lags				0	0		0	0		0	0							

1994_eq5																		
	EG			dols_SIC			dols_AIC			dols_HQ			ardl_SIC		ardl_AIC		ardl_HQ	
SIC	1	-3.51	NO	2	-3.992	5%	0	-4.204	5%	0	-4.204	5%	7.511	5%	11.008	5%	7.511	5%
AIC	1	-3.51	NO	2	-3.992	5%	0	-4.204	5%	0	-4.204	5%	3	2	2	3	3	2
HQ	1	-3.51	NO	2	-3.992	5%	0	-4.204	5%	0	-4.204	5%						
	coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat	coeff	t-stat	coeff	t-stat
CONST	0.017	1.244		0.017	0.982		0.174	3.821		0.174	3.821		0.112	4.06	0.139	3.528	0.112	4.06
GDP	-0.675	-5.144		-0.691	-4.855		-1.087	-5.94		-1.087	-5.94		-1.027	-4.252	-1.057	-4.906	-1.027	-4.252
REGD	-0.322	-4.796		-0.324	-4.584		-0.224	-2.815		-0.224	-2.815		-0.233	-2.695	-0.232	-3.035	-0.233	-2.695
leads+lags				0	0		0	3		0	3							

1994_eq6																		
	EG			dols_SIC			dols_AIC			dols_HQ			ardl_SIC		ardl_AIC		ardl_HQ	
SIC	2	-4.201	5%	2	-4.179	5%	2	-4.179	5%	2	-4.179	5%	5.072	5%	5.072	5%	5.072	5%
AIC	2	-4.201	5%	2	-4.179	5%	2	-4.179	5%	2	-4.179	5%	2	0	2	0	2	0
HQ	2	-4.201	5%	2	-4.179	5%	2	-4.179	5%	2	-4.179	5%						
	coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat	coeff	t-stat	coeff	t-stat
CONST	0.007	0.51		0.003	0.158		0.003	0.158		0.003	0.158		0.024	0.923	0.024	0.923	0.024	0.923
GOV	-1.264	-4.045		-1.248	-3.621		-1.248	-3.621		-1.248	-3.621		-1.448	-2.475	-1.448	-2.475	-1.448	-2.475
REGD	-0.318	-3.781		-0.327	-3.584		-0.327	-3.584		-0.327	-3.584		-0.269	-2.341	-0.269	-2.341	-0.269	-2.341
leads+lags				0	0		0	0		0	0							

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1993_eq1	Eq1																	
	EG				dols_SIC			dols_AIC			dols_HQ			ardl_SIC		ardl_AIC		ardl_HQ	
SIC		0	-4.779	5%	1	-6.436	5%	1	-6.436	5%	1	-6.436	5%	5.082	5%	6.744	5%	6.744	5%
AIC		4	-3.366	NO	1	-6.436	5%	1	-6.436	5%	1	-6.436	5%	3	0	2	3	2	3
HQ		0	-4.779	5%	1	-6.436	5%	1	-6.436	5%	1	-6.436	5%						
	coeff		t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat	coeff	t-stat	coeff	t-stat
CONST		-0.099	-11.051		-0.19	-5.753		-0.19	-5.753		-0.19	-5.753		-0.097	-3.118	-0.115	-1.694	-0.115	-1.694
GDP		-0.206	-2.335		-0.002	-0.039		-0.002	-0.039		-0.002	-0.039		-0.218	-1.694	-0.118	-1.508	-0.118	-1.508
INTCPI		0.003	5.711		0.007	4.751		0.007	4.751		0.007	4.751		0.003	1.748	0.002	0.642	0.002	0.642
REGD		-0.093	-3.142		-0.102	-3.299		-0.102	-3.299		-0.102	-3.299		-0.085	-1.554	-0.117	-2.727	-0.117	-2.727
leads+lags					2	3		2	3		2	3							

1993_eq2																			
	EG				dols_SIC			dols_AIC			dols_HQ			ardl_SIC		ardl_AIC		ardl_HQ	
SIC		0	-5.029	5%	1	-7.046	5%	1	-7.046	5%	1	-7.046	5%	3.214	AMB10 %	5.837	5%	5.837	5%
AIC		0	-5.029	5%	1	-7.046	5%	1	-7.046	5%	1	-7.046	5%	1	1	2	3	2	3
HQ		0%	-5.029	5%	1	-7.046	5%	1	-7.046	5%	1	-7.046	5%						
	coeff		t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat	coeff	t-stat	coeff	t-stat
CONST		-0.107	-12.113		-0.148	-6.109		-0.148	-6.109		-0.148	-6.109		-0.099	-1.033	-0.124	-1.509	-0.124	-1.509
PROD1		-0.008	-0.062		0.084	0.481		0.084	0.481		0.084	0.481		-0.051	-0.142	-0.187	-0.842	-0.187	-0.842
INTCPI		0.004	6.15		0.006	5.092		0.006	5.092		0.006	5.092		0	0.097	0.001	0.315	0.001	0.315
REGD		-0.156	-5.814		-0.139	-2.916		-0.139	-2.916		-0.139	-2.916		-0.156	-1.379	-0.114	-1.602	-0.114	-1.602
leads+lags					2	3		2	3		2	3							

1993_eq3																			
	EG				dols_SIC			dols_AIC			dols_HQ			ardl_SIC		ardl_AIC		ardl_HQ	
SIC		0	-5.011	5%	1	-6.189	5%	1	-6.189	5%	1	-6.189	5%	7.239	5%	6.656	5%	6.656	5%
AIC		4	-3.352	NO	1	-6.189	5%	1	-6.189	5%	1	-6.189	5%	1	3	2	3	2	3
HQ		0	-5.011	5%	1	-6.189	5%	1	-6.189	5%	1	-6.189	5%						
	coeff		t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat	coeff	t-stat	coeff	t-stat
CONST		-0.104	-11.616		-0.097	-7.335		-0.097	-7.335		-0.097	-7.335		-0.13	-3.122	-0.126	-2.224	-0.126	-2.224
REGD		-0.138	-8.542		-0.181	-10.921		-0.181	-10.921		-0.181	-10.921		-0.133	-4.214	-0.137	-3.225	-0.137	-3.225
INTCPI		0.004	5.999		0.004	3.513		0.004	3.513		0.004	3.513		0.003	1.69	0.002	0.852	0.002	0.852
GOV		-0.385	-1.498		0.054	0.408		0.054	0.408		0.054	0.408		-0.232	-1.292	-0.239	-1.09	-0.239	-1.09
leads+lags					3	3		3	3		3	3							

1993_eq4																			
	EG				dols_SIC			dols_AIC			dols_HQ			ardl_SIC		ardl_AIC		ardl_HQ	
SIC		0	-5.041	5%	1	-6.695	5%	1	-6.695	5%	1	-6.695	5%	10.127	5%	10.127	5%	10.127	5%
AIC		1	-4.092	5%	1	-6.695	5%	1	-6.695	5%	1	-6.695	5%	2	3	2	3	2	3
HQ		0	-5.041	5%	1	-6.695	5%	1	-6.695	5%	1	-6.695	5%						
	coeff		t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat	coeff	t-stat	coeff	t-stat
CONST		-0.107	-12.28		-0.144	-9.02		-0.144	-9.02		-0.144	-9.02		-0.111	-1.812	-0.111	-1.812	-0.111	-1.812
REGD		-0.158	-16.225		-0.131	-8.946		-0.131	-8.946		-0.131	-8.946		-0.16	-3.281	-0.16	-3.281	-0.16	-3.281
INTCPI		0.004	6.683		0.005	5.48		0.005	5.48		0.005	5.48		0.001	0.474	0.001	0.474	0.001	0.474
leads+lags					2	3		2	3		2	3							

1993_eq5																			
	EG				dols_SIC			dols_AIC			dols_HQ			ardl_SIC		ardl_AIC		ardl_HQ	
SIC		0	-3.92	10%	0	-2.865	NO	0	-3.966	5%	0	-3.966	5%	3.711	AMB10 %	4.56	10%	2.482	NO
AIC		3	-1.426	NO	0	-2.865	NO	4	-3.747	10%	4	-3.747	10%	1	1	2	3	2	1
HQ		0	-3.92	10%	0	-2.865	NO	4	-3.747	10%	4	-3.747	10%						
	coeff		t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat	coeff	t-stat	coeff	t-stat
CONST		-0.124	-10.779		-0.197	-16.349		-0.178	-10.096		-0.178	-10.096		-0.035	-0.156	-0.804	0.912	-0.015	-0.033
PROD1		-0.742	-10.857		-0.438	-6.777		-0.652	-6.439		-0.652	-6.439		-1.119	-1.306	2.424	-0.901	-1.332	-0.868
INTCPI		0.004	3.946		0.01	10.523		0.007	4.555		0.007	4.555		-0.011	-1.002	0.089	-1.924	-0.021	-0.868
leads+lags					2	0		3	3		3	3							

1993_eq6																			
	EG				dols_SIC			dols_AIC			dols_HQ			ardl_SIC		ardl_AIC		ardl_HQ	
SIC		1	-4.349	NO	0	-6.473	5%	0	-6.473	5%	0	-6.473	5%	4.44	5%	3.176	AMB10 %	3.176	AMB10 %
AIC		1	-4.349	NO	1	-5.594	5%	1	-5.594	5%	1	-5.594	5%	1	0	2	2	2	2
HQ		1	-4.349	NO	1	-5.594	5%	1	-5.594	5%	1	-5.594	5%						
	coeff		t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat	coeff	t-stat	coeff	t-stat
CONST		-0.096	-10.948		-0.195	-2.925		-0.195	-2.925		-0.195	-2.925		-0.101	-3.874	-0.081	-0.657	-0.081	-0.657
PROD2		0.237	1.896		0.024	0.067		0.024	0.067		0.024	0.067		0.261	1.347	0.153	0.324	0.153	0.324
INTCPI		0.004	6.067		0.007	2.547		0.007	2.547		0.007	2.547		0.004	3.237	-0.001	-0.172	-0.001	-0.172
GDP		-0.279	-2.987		-0.102	-0.693		-0.102	-0.693		-0.102	-0.693		-0.233	-1.759	-0.25	-1	-0.25	-1
REGD		-0.113	-3.711		-0.066	-0.957		-0.066	-0.957		-0.066	-0.957		-0.127	-2.677	-0.122	-1.186	-0.122	-1.186
leads+lags					2	2		2	2		2	2							

1993_eq7																			
	EG				dols_SIC			dols_AIC			dols_HQ			ardl_SIC		ardl_AIC		ardl_HQ	
SIC		0	-4.976	5%	1	-5.981	5%	1	-5.981	5%	1	-5.981	5%	6.55	5%	6.55	5%	6.55	5%
AIC		4	-3.583	NO	3	-4.705	5%	3	-4.705	5%	3	-4.705	5%	2	3	2	3	2	3
HQ		0	-4.976	5%	3	-4.705	5%	3	-4.705	5%	3	-4.705	5%						
	coeff		t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat	coeff	t-stat	coeff	t-stat
CONST		-0.107	-12.288		-0.167	-10.674		-0.167	-10.674		-0.167	-10.674		-0.114	-1.866	-0.114	-1.866	-0.114	-1.866
PROD3		-0.069	-1.177		0.049	1.003		0.049	1.003		0.049	1.003		-0.099	-1.777	-0.099	-1.777	-0.099	-1.777
INTCPI		0.004	6.068		0.007	5.811		0.007	5.811		0.007	5.811		0.001	0.403	0.001	0.403	0.001	0.403
REGD		-0.132	-5.477		-0.144	-7.009		-0.144	-7.009		-0.144	-7.009		-0.12	-2.537	-0.12	-2.537	-0.12	-2.537
leads+lags					3	3		3	3		3	3							

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1994_eq1	Eq1																	
	EG			dols_SIC			dols_AIC			dols_HQ			ardl_SIC		ardl_AIC		ardl_HQ	
SIC	3	-2.26	NO	0	-5.039	5%	0	-4.92	5%	0	-4.92	5%	5.291	5%	3.629	AMB10%	3.629	AMB10%
AIC	3	-2.26	NO	3	-2.851	NO	3	-4.153	10%	3	-4.153	10%	3	2	2	3	2	3
HQ	3	-2.26	NO	2	-2.539	NO	1	-4.674	5%	1	-4.674	5%						
	coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat	coeff	t-stat	coeff	t-stat
CONST	-0.104	-8.43		-0.173	-8.079		-0.091	-0.727		-0.091	-0.727		-0.166	-2.259	-0.175	-2.227	-0.175	-2.227
GDP	-0.17	-1.74		0.064	0.566		-0.437	-0.306		-0.437	-0.306		-0.175	-0.846	0.052	0.28	0.052	0.28
INTCPI	0.004	4.876		0.006	4.093		0	-0.008		0	-0.008		0.002	0.491	0.005	1.28	0.005	1.28
REGD	-0.102	-2.772		-0.147	-3.655		0	0		0	0		-0.065	-0.711	-0.143	-1.653	-0.143	-1.653
leads+lags				0	3		3	3		3	3							

1994_eq2																		
	EG			dols_SIC			dols_AIC			dols_HQ			ardl_SIC		ardl_AIC		ardl_HQ	
SIC	3	-2.471	NO	1	-5.71	5%	1	-5.71	5%	1	-5.71	5%	2.434	NO	2.434	NO	2.434	NO
AIC	3	-2.471	NO	1	-5.71	5%	1	-5.71	5%	1	-5.71	5%	3	3	3	3	3	3
HQ	300%	-2.471	NO	1	-5.71	5%	1	-5.71	5%	1	-5.71	5%						
	coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat	coeff	t-stat	coeff	t-stat
CONST	-0.11	-8.632		-0.077	-2.045		-0.077	-2.045		-0.077	-2.045		-0.139	-2.212	-0.139	-2.212	-0.139	-2.212
REGD	-0.138	-5.3		-0.239	-2.021		-0.239	-2.021		-0.239	-2.021		-0.15	-1.912	-0.15	-1.912	-0.15	-1.912
INTCPI	0.004	5.367		0.005	2.401		0.005	2.401		0.005	2.401		0.005	1.378	0.005	1.378	0.005	1.378
GOV	-0.331	-1.06		0.732	0.559		0.732	0.559		0.732	0.559		0.197	0.277	0.197	0.277	0.197	0.277
leads+lags				3	3		3	3		3	3							

1994_eq3																		
	EG			dols_SIC			dols_AIC			dols_HQ			ardl_SIC		ardl_AIC		ardl_HQ	
SIC	3	-2.871	NO	3	-6.29	5%	3	-6.29	5%	3	-6.29	5%	11.045	5%	4.572	5%	4.572	5%
AIC	3	-2.871	NO	4	-2.129	NO	4	-2.129	NO	4	-2.129	NO	2	2	3	2	3	2
HQ	3	-2.871	NO	4	-2.129	NO	4	-2.129	NO	4	-2.129	NO						
	coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat	coeff	t-stat	coeff	t-stat
CONST	-0.108	-8.315		-0.161	-6.197		-0.161	-6.197		-0.161	-6.197		-0.139	-1.48	-0.123	-1.268	-0.123	-1.268
PROD3	-0.014	-0.216		0.188	1.117		0.188	1.117		0.188	1.117		-0.627	-3.472	-0.37	-1.585	-0.37	-1.585
INTCPI	0.005	5.323		0.009	3.923		0.009	3.923		0.009	3.923		-0.007	-1.306	-0.004	-0.649	-0.004	-0.649
REGD	-0.156	-4.814		-0.214	-2.402		-0.214	-2.402		-0.214	-2.402		0.148	1.116	0.013	0.087	0.013	0.087
leads+lags				3	3		3	3		3	3							

1994_eq4																		
	EG			dols_SIC			dols_AIC			dols_HQ			ardl_SIC		ardl_AIC		ardl_HQ	
SIC	3	-3.023	NO	1	-6.579	5%	1	-6.579	5%	1	-6.579	5%	4.951	5%	5.745	5%	5.745	5%
AIC	3	-3.023	NO	1	-6.579	5%	1	-6.579	5%	1	-6.579	5%	2	1	2	2	2	2
HQ	3	-3.023	NO	1	-6.579	5%	1	-6.579	5%	1	-6.579	5%						
	coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat	coeff	t-stat	coeff	t-stat
CONST	-0.101	-8.407		-0.203	-2.42		-0.203	-2.42		-0.203	-2.42		-0.225	-1.697	-0.145	-1.274	-0.145	-1.274
PROD1	0.25	1.868		0.089	0.211		0.089	0.211		0.089	0.211		-1.022	-1.581	-0.442	-0.83	-0.442	-0.83
INTCPI	0.004	5.304		0.009	1.851		0.009	1.851		0.009	1.851		-0.007	-1.073	-0.006	-0.991	-0.006	-0.991
REGD	-0.126	-3.336		-0.16	-1.903		-0.16	-1.903		-0.16	-1.903		0.461	2.11	0.207	1.251	0.207	1.251
GDP	-0.242	-2.377		0.109	0.29		0.109	0.29		0.109	0.29		-0.82	-2.319	-0.637	-2.219	-0.637	-2.219
leads+lags				2	2		2	2		2	2							

1994_eq5																		
	EG			dols_SIC			dols_AIC			dols_HQ			ardl_SIC		ardl_AIC		ardl_HQ	
SIC	0	-3.715	NO	2	-6.156	5%	2	-6.156	5%	2	-6.156	5%	5.529	5%	5.529	5%	5.529	5%
AIC	0	-3.715	NO	2	-6.156	5%	2	-6.156	5%	2	-6.156	5%	2	2	2	2	2	2
HQ	0	-3.715	NO	2	-6.156	5%	2	-6.156	5%	2	-6.156	5%						
	coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat	coeff	t-stat	coeff	t-stat
CONST	-0.086	-6.424		-0.167	-3.152		-0.167	-3.152		-0.167	-3.152		-0.159	-1.309	-0.159	-1.309	-0.159	-1.309
PROD3	0.287	2.594		0.403	0.982		0.403	0.982		0.403	0.982		-0.69	-0.736	-0.69	-0.736	-0.69	-0.736
INTCPI	0.004	4.982		0.009	4.666		0.009	4.666		0.009	4.666		-0.006	-1.05	-0.006	-1.05	-0.006	-1.05
REGD	-0.096	-2.827		-0.247	-4.374		-0.247	-4.374		-0.247	-4.374		0.145	0.921	0.145	0.921	0.145	0.921
GDP	-0.549	-3.2		-0.161	-0.284		-0.161	-0.284		-0.161	-0.284		0.107	0.088	0.107	0.088	0.107	0.088
leads+lags				2	2		2	2		2	2							

1994_eq6																		
	EG			dols_SIC			dols_AIC			dols_HQ			ardl_SIC		ardl_AIC		ardl_HQ	
SIC	0	-4.348	NO	0	-4.662	10%	0	-4.662	10%	0	-4.662	10%	9.205	5%	9.205	5%	9.205	5%
AIC	3	-3.06	NO	0	-4.662	10%	0	-4.662	10%	0	-4.662	10%	2	2	2	2	2	2
HQ	3	-3.06	NO	0	-4.662	10%	0	-4.662	10%	0	-4.662	10%						
	coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat	coeff	t-stat	coeff	t-stat
CONST	-0.11	-9.01		-0.073	-1.464		-0.073	-1.464		-0.073	-1.464		-0.142	-2.51	-0.142	-2.51	-0.142	-2.51
PROD1	0.293	1.941		0.793	0.816		0.793	0.816		0.793	0.816		0.359	1.019	0.359	1.019	0.359	1.019
INTCPI	0.005	5.896		0.001	0.263		0.001	0.263		0.001	0.263		-0.001	-0.461	-0.001	-0.461	-0.001	-0.461
REGD	-0.169	-5.718		-0.261	-2.963		-0.261	-2.963		-0.261	-2.963		-0.071	-0.778	-0.071	-0.778	-0.071	-0.778
GOV	-0.71	-1.984		-1.354	-0.509		-1.354	-0.509		-1.354	-0.509		-1.96	-2.977	-1.96	-2.977	-1.96	-2.977
leads+lags				2	2		2	2		2	2							

1994_eq7= 1993_eq4																		
	EG			dols_SIC			dols_AIC			dols_HQ			ardl_SIC		ardl_AIC		ardl_HQ	
SIC	3	-2.942	NO	1	-6.047	5%	1	-6.842	5%	1	-6.842	5%	5.233	5%	3.139	NO	5.233	5%
AIC	3	-2.942	NO	1	-6.047	5%	3	-4.479	5%	3	-4.479	5%	3	2	3	3	3	2
HQ	3	-2.942	NO	1	-6.047	5%	1	-6.842	5%	1	-6.842	5%						
	coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat		coeff	t-stat	coeff	t-stat	coeff	t-stat
CONST	-0.108	-8.552		-0.14	-9.837		-0.142	-8.991		-0.142	-8.991		-0.119	-1.405	-0.138	-2.023	-0.119	-1.405
REGD	-0.162	-11.852		-0.138	-10.592		-0.135	-9.269		-0.135	-9.269		-0.16	-2.111	-0.142	-2.305	-0.16	-2.111
INTCPI	0.005	5.603		0.005	5.132		0.005	4.982		0.005	4.982		0.001	0.233	0.004	1.137	0.001	0.233
leads+lags				0	3		1	3		1	3							

APPENDIX D. Panel OLS, FMOLS and DOLS estimates

Equation 1: RERCPI=f(PROD,INTCPI,REGD,FDEBT,OPEN)

Panel 5, 1993-2002

	OLS	1	2	3	4	5	FMOLS	1	2	3	4	5	DOLS	1	2	3	4	5
prod1	Coeff	-0.623	-0.006	-0.073	-0.157	0.004	coeff	-0.531	-0.005	-0.012	-0.244	-0.125	coeff	-0.530	-0.005	0.011	-0.204	-0.081
	t-stat	-4.863	-5.440	-1.367	-3.564	0.054	t-stat	-4.040	-4.505	-0.214	-5.398	-1.579	t-stat	-3.825	-4.540	0.188	-4.269	-0.978
prod2	coeff	-0.876	-0.005	-0.015	-0.128	0.089	coeff	-0.785	-0.005	0.021	-0.197	-0.005	coeff	-0.746	-0.006	0.044	-0.160	0.014
	t-stat	-6.783	-5.079	-0.279	-3.101	1.238	t-stat	-5.927	-4.939	0.381	-4.665	-0.067	t-stat	-5.343	-5.236	0.758	-3.594	0.184
prod3	coeff	-0.159	-0.006	-0.197	-0.108	-0.158	coeff	-0.391	-0.006	-0.024	-0.188	-0.327	coeff	-0.352	-0.006	-0.011	-0.157	-0.270
	t-stat	-1.451	-4.789	-3.760	-2.088	-1.843	t-stat	-3.470	-4.352	-0.445	-3.549	-3.722	t-stat	-2.963	-4.570	-0.186	-2.819	-2.911
gdp	coeff	-0.569	-0.004	-0.102	-0.059	-0.121	coeff	-0.920	-0.002	0.035	-0.085	-0.148	coeff	-0.892	-0.003	0.030	-0.060	-0.100
	t-stat	-2.584	-3.415	-1.499	-1.161	-1.409	t-stat	-4.074	-1.774	0.498	-1.624	-1.673	t-stat	-3.746	-2.011	0.411	-1.083	-1.078

Panel 5, 1994-2002

	OLS	1	2	3	4	5	FMOLS	1	2	3	4	5	DOLS	1	2	3	4	5
prod1	coeff	-0.579	-0.007	-0.156	-0.119	0.031	coeff	-0.578	-0.007	0.020	-0.247	-0.151	coeff	-0.562	-0.006	0.042	-0.198	-0.077
	t-stat	-4.370	-5.111	-2.574	-2.789	0.413	t-stat	-4.242	-5.039	0.325	-5.626	-1.947	t-stat	-3.888	-3.743	0.634	-4.248	-0.928
prod2	coeff	-0.801	-0.007	-0.098	-0.089	0.100	coeff	-0.810	-0.008	0.053	-0.199	-0.037	coeff	-0.759	-0.007	0.068	-0.154	0.010
	t-stat	-5.970	-4.898	-1.625	-2.195	1.382	t-stat	-5.869	-5.585	0.849	-4.771	-0.498	t-stat	-5.184	-4.468	1.027	-3.481	0.123
prod3	coeff	-0.004	-0.009	-0.361	-0.077	-0.034	coeff	-0.382	-0.008	-0.004	-0.186	-0.349	coeff	-0.356	-0.007	0.012	-0.152	-0.280
	t-stat	-0.036	-5.688	-6.566	-1.603	-0.416	t-stat	-3.694	-5.205	-0.070	-3.754	-4.128	t-stat	-3.245	-4.065	0.204	-2.899	-3.128
gdp	coeff	-0.317	-0.008	-0.279	-0.036	-0.019	coeff	-0.913	-0.004	0.054	-0.086	-0.169	coeff	-0.884	-0.002	0.032	-0.050	-0.088
	t-stat	-1.528	-4.741	-3.992	-0.749	-0.234	t-stat	-4.277	-2.333	0.755	-1.757	-1.976	t-stat	-3.905	-1.262	0.417	-0.952	-0.974

Panel 8, 1994-2002

	OLS	1	2	3	4	5	FMOLS	1	2	3	4	5	DOLS	1	2	3	4	5
prod3	coeff	-0.051	-0.004	-0.402	-0.142	0.125	coeff	-0.034	-0.001	-0.381	-0.167	0.186	coeff	-0.043	0.002	-0.389	-0.150	0.240
	t-stat	-0.553	-5.364	-11.647	-4.760	1.797	t-stat	-0.360	-1.654	-10.734	-5.457	2.605	t-stat	-0.429	2.272	-10.345	-4.615	3.167
gdp	coeff	-0.212	-0.004	-0.378	-0.120	0.170	coeff	0.144	-0.003	-0.391	-0.175	0.145	coeff	0.038	0.001	-0.392	-0.155	0.220
	t-stat	-1.655	-5.494	-11.263	-3.971	2.559	t-stat	1.092	-4.031	-11.320	-5.652	2.121	t-stat	0.274	1.595	-10.702	-4.698	3.044

Panel 8, 1995-2002

	OLS	1	2	3	4	5	FMOLS	1	2	3	4	5	DOLS	1	2	3	4	5
prod1	coeff	-0.176	-0.005	-0.407	-0.127	0.175	coeff	-0.125	0.000	-0.357	-0.178	0.227	coeff	-0.057	0.003	-0.375	-0.152	0.258
	t-stat	-2.273	-3.820	-7.332	-4.601	2.551	t-stat	-1.557	-0.162	-6.230	-6.240	3.207	t-stat	-0.663	1.767	-6.121	-4.996	3.407
prod3	coeff	0.028	-0.006	-0.470	-0.118	0.117	Coeff	-0.057	0.000	-0.378	-0.166	0.195	coeff	-0.042	0.003	-0.391	-0.144	0.249
	t-stat	0.309	-4.163	-8.844	-4.159	1.718	t-stat	-0.611	-0.234	-6.892	-5.663	2.763	t-stat	-0.419	1.938	-6.668	-4.587	3.302
gdp	coeff	-0.231	-0.006	-0.404	-0.088	0.135	Coeff	0.068	-0.001	-0.389	-0.169	0.172	coeff	0.051	0.003	-0.395	-0.148	0.231
	t-stat	-1.579	-4.121	-7.562	-3.006	2.013	t-stat	0.451	-0.934	-7.068	-5.624	2.484	t-stat	0.313	1.599	-6.714	-4.601	3.123

Panel 9, 1995-2002

	OLS	1	2	3	4	5	FMOLS	1	2	3	4	5	DOLS	1	2	3	4	5
prod1	coeff	-0.097	-0.006	-0.439	-0.109	0.157	Coeff	0.045	0.000	-0.420	-0.138	0.216	coeff	0.073	0.003	-0.428	-0.122	0.247
	t-stat	-1.321	-5.009	-8.157	-4.313	2.407	t-stat	0.588	-0.176	-7.561	-5.293	3.218	t-stat	0.898	2.057	-7.208	-4.369	3.442
prod3	coeff	0.048	-0.006	-0.478	-0.113	0.116	Coeff	0.003	0.000	-0.416	-0.139	0.229	coeff	0.007	0.003	-0.423	-0.120	0.284
	t-stat	0.561	-4.973	-9.254	-4.282	1.790	t-stat	0.039	0.021	-7.804	-5.109	3.425	t-stat	0.079	2.401	-7.421	-4.123	3.966
gdp	coeff	-0.255	-0.006	-0.403	-0.077	0.141	Coeff	0.034	0.000	-0.418	-0.136	0.234	coeff	0.029	0.003	-0.422	-0.122	0.274
	t-stat	-1.878	-5.001	-7.894	-2.847	2.225	t-stat	0.243	-0.076	-7.940	-4.860	3.578	t-stat	0.195	2.384	-7.504	-4.088	3.920

Note: DOLS is estimated using 1 leads and 1 lag (DOLS(1,1)). In the first raw, 1, 2, 3… stand for the regressor variables shown in RERCPI=f(1,2,3…).

Equation 2: RERCPI=f(PROD,INTCPI,REG,FDEBT,GOV)

Panel 5, 1993-2002

	OLS	1	2	3	4	5	FMOLS	1	2	3	4	5	DOLS	1	2	3	4	5
prod1	coeff	-0.497	-0.005	-0.068	-0.100	-0.830	coeff	-0.553	-0.005	-0.038	-0.187	-0.398	coeff	-0.566	-0.005	0.004	-0.173	-0.300
	t-stat	-4.179	-4.972	-1.578	-2.585	-2.760	t-stat	-4.530	-4.540	-0.849	-4.747	-1.289	t-stat	-4.400	-4.518	0.083	-4.152	-0.923
prod2	coeff	-0.724	-0.004	0.011	-0.087	-0.790	coeff	-0.747	-0.005	0.036	-0.153	-0.459	coeff	-0.723	-0.006	0.062	-0.131	-0.474
	t-stat	-6.584	-4.688	0.275	-2.565	-3.070	t-stat	-6.623	-6.036	0.846	-4.395	-1.737	t-stat	-6.087	-6.423	1.378	-3.569	-1.702
prod3	coeff	-0.365	-0.004	-0.112	0.036	-1.685	coeff	-0.702	-0.004	0.031	0.025	-1.941	coeff	-0.683	-0.004	0.050	0.034	-1.932
	t-stat	-4.310	-4.073	-2.863	0.887	-6.066	t-stat	-8.085	-3.950	0.772	0.600	-6.813	t-stat	-7.471	-4.124	1.179	0.765	-6.433
Gdp	coeff	-0.425	-0.004	-0.127	0.002	-1.032	coeff	-0.925	-0.001	-0.037	-0.060	0.208	coeff	-0.988	-0.001	-0.004	-0.053	0.332
	t-stat	-2.387	-3.701	-2.553	0.042	-3.525	t-stat	-5.065	-1.027	-0.719	-1.468	0.693	t-stat	-5.133	-1.298	-0.079	-1.241	1.048

Panel 5, 1994-2002

	OLS	1	2	3	4	5	FMOLS	1	2	3	4	5	DOLS	1	2	3	4	5
prod1	coeff	-0.390	-0.006	-0.132	-0.024	-1.347	coeff	-0.638	-0.005	-0.007	-0.184	-0.517	coeff	-0.591	-0.005	0.031	-0.170	-0.266
	t-stat	-3.675	-5.528	-3.070	-0.740	-5.307	t-stat	-5.840	-4.569	-0.148	-5.444	-1.980	t-stat	-5.101	-4.359	0.659	-4.740	-0.960
prod2	coeff	-0.572	-0.005	-0.063	-0.016	-1.267	coeff	-0.812	-0.007	0.069	-0.144	-0.599	coeff	-0.753	-0.007	0.087	-0.126	-0.500
	t-stat	-5.712	-5.492	-1.535	-0.546	-5.619	t-stat	-7.883	-6.905	1.633	-4.735	-2.584	t-stat	-6.890	-6.755	1.935	-3.891	-2.034
prod3	coeff	-0.204	-0.006	-0.207	0.063	-1.846	coeff	-0.721	-0.005	0.045	0.039	-2.087	coeff	-0.690	-0.005	0.064	0.039	-1.952
	t-stat	-2.958	-5.879	-5.754	1.854	-7.821	t-stat	- 10.151	-4.747	1.220	1.121	-8.594	t-stat	-9.159	-4.361	1.620	1.049	-7.580
Gdp	coeff	-0.104	-0.007	-0.243	0.040	-1.600	Coeff	-0.947	0.000	-0.030	-0.054	0.153	coeff	-0.984	0.000	0.002	-0.047	0.370
	t-stat	-0.673	-5.636	-5.253	1.171	-6.187	t-stat	-5.957	-0.236	-0.633	-1.560	0.573	t-stat	-5.840	-0.348	0.036	-1.259	1.312

Panel 8, 1994-2002

	OLS	1	2	3	4	5	FMOLS	1	2	3	4	5	DOLS	1	2	3	4	5
Prod3	coeff	-0.018	-0.005	-0.292	-0.142	-1.101	coeff	0.049	-0.001	-0.322	-0.211	-0.156	coeff	-0.034	0.001	-0.342	-0.211	-0.295
	t-stat	-0.236	-8.091	- 10.003	-5.734	-4.303	t-stat	0.636	-1.278	- 10.703	-8.293	-0.591	t-stat	-0.417	1.426	- 10.741	-7.830	-1.058
Gdp	coeff	0.086	-0.005	-0.304	-0.151	-1.168	coeff	0.371	-0.003	-0.366	-0.208	-0.430	coeff	0.250	-0.001	-0.366	-0.210	-0.376
	t-stat	0.769	-7.887	- 10.570	-5.871	-4.397	t-stat	3.221	-5.493	- 12.391	-7.860	-1.573	t-stat	2.050	-1.343	- 11.673	-7.478	-1.296

Panel 8, 1995-2002

	OLS	1	2	3	4	5	FMOLS	1	2	3	4	5	DOLS	1	2	3	4	5
prod1	coeff	-0.157	-0.007	-0.231	-0.122	-1.288	coeff	0.071	0.000	-0.328	-0.204	-0.234	coeff	0.053	-0.001	-0.374	-0.206	-0.365
	t-stat	-2.521	-6.415	-5.049	-5.385	-5.405	t-stat	1.114	-0.171	-6.941	-8.693	-0.950	t-stat	0.769	-0.388	-7.415	-8.205	-1.389
prod3	coeff	-0.013	-0.007	-0.303	-0.106	-1.247	coeff	0.006	0.000	-0.308	-0.214	-0.247	coeff	-0.074	0.000	-0.355	-0.211	-0.435
	t-stat	-0.175	-6.576	-7.044	-4.562	-5.198	t-stat	0.076	-0.148	-6.944	-8.887	-0.996	t-stat	-0.925	0.163	-7.473	-8.224	-1.643
gdp	coeff	-0.004	-0.007	-0.297	-0.106	-1.263	coeff	0.359	-0.004	-0.361	-0.210	-0.519	coeff	0.254	-0.002	-0.379	-0.209	-0.461
	t-stat	-0.030	-6.612	-6.824	-4.304	-5.041	t-stat	2.769	-3.416	-8.042	-8.306	-2.008	t-stat	1.833	-1.472	-7.896	-7.720	-1.668

Panel 9, 1995-2002

	OLS	1	2	3	4	5	FMOLS	1	2	3	4	5	DOLS	1	2	3	4	5
prod1	coeff	-0.045	-0.008	-0.300	-0.099	-1.096	coeff	0.245	-0.001	-0.400	-0.161	-0.162	coeff	0.213	-0.001	-0.430	-0.168	-0.276
	t-stat	-0.704	-7.688	-6.366	-4.439	-4.598	t-stat	3.749	-0.480	-8.214	-6.984	-0.657	t-stat	3.056	-0.503	-8.268	-6.824	-1.049
prod3	coeff	0.042	-0.008	-0.334	-0.101	-1.085	coeff	0.119	0.000	-0.357	-0.186	-0.166	coeff	0.023	0.000	-0.397	-0.188	-0.378
	t-stat	0.577	-7.617	-7.567	-4.403	-4.583	t-stat	1.571	0.399	-7.825	-7.869	-0.678	t-stat	0.287	-0.118	-8.153	-7.468	-1.447
gdp	coeff	-0.042	-0.008	-0.303	-0.092	-1.089	coeff	0.373	-0.002	-0.390	-0.183	-0.425	coeff	0.265	-0.001	-0.417	-0.186	-0.470
	t-stat	-0.334	-7.695	-6.846	-3.805	-4.416	t-stat	2.898	-1.499	-8.529	-7.330	-1.670	t-stat	1.925	-0.930	-8.525	-6.978	-1.728

Equation 3: RERCPI=f(PROD,INTCPI,REG,FDEBT,GOV)

Panel 5, 1993-2002

	OLS	1	2	3	4	5	FMOLS	1	2	3	4	5	DOLS	1	2	3	4	5
prod1	coeff	-0.438	-0.005	-0.132	0.140	-1.311	coeff	-0.396	-0.003	-0.139	0.190	-1.475	coeff	-0.527	-0.003	-0.056	0.218	-1.284
	t-stat	-3.473	-4.777	-2.776	2.042	-4.281	t-stat	-3.060	-2.870	-2.851	2.712	-4.698	t-stat	-3.863	-2.831	-1.089	2.951	-3.880
prod2	coeff	-0.790	-0.004	-0.039	0.218	-1.192	coeff	-0.992	-0.004	0.012	0.359	-1.562	coeff	-1.032	-0.004	0.068	0.361	-1.450
	t-stat	-6.895	-4.787	-0.895	3.684	-4.629	t-stat	-8.440	-4.178	0.272	5.903	-5.916	t-stat	-8.328	-4.594	1.426	5.632	-5.209
prod3	coeff	-0.320	-0.004	-0.109	-0.055	-1.493	coeff	-0.689	-0.004	0.053	-0.081	-1.763	coeff	-0.635	-0.004	0.050	-0.072	-1.660
	t-stat	-4.029	-4.380	-2.603	-0.853	-5.677	t-stat	-8.467	-3.962	1.239	-1.221	-6.539	t-stat	-7.406	-4.020	1.101	-1.032	-5.839
gdp	coeff	-0.407	-0.004	-0.122	-0.033	-1.008	coeff	-0.992	-0.001	0.002	-0.050	-0.007	coeff	-1.000	-0.001	0.024	-0.057	0.116
	t-stat	-2.268	-3.746	-2.295	-0.492	-3.447	t-stat	-5.392	-0.845	0.038	-0.718	-0.024	t-stat	-5.156	-0.762	0.425	-0.780	0.365

Panel 5, 1994-2002

	OLS	1	2	3	4	5	FMOLS	1	2	3	4	5	DOLS	1	2	3	4	5
prod1	coeff	-0.407	-0.007	-0.168	0.097	-1.404	coeff	-0.500	-0.003	-0.109	0.206	-1.592	coeff	-0.559	-0.002	-0.027	0.227	-1.189
	t-stat	-3.649	-5.684	-3.520	1.614	-5.369	t-stat	-4.364	-2.809	-2.211	3.333	-5.921	t-stat	-4.594	-1.675	-0.520	3.464	-4.168
prod2	coeff	-0.643	-0.006	-0.098	0.139	-1.261	coeff	-1.044	-0.005	0.043	0.343	-1.628	coeff	-1.047	-0.005	0.093	0.351	-1.412
	t-stat	-6.028	-5.718	-2.151	2.537	-5.382	t-stat	-9.519	-4.818	0.907	6.102	-6.757	t-stat	-8.996	-4.373	1.860	5.887	-5.524
prod3	coeff	-0.118	-0.007	-0.233	-0.008	-1.535	coeff	-0.690	-0.005	0.065	-0.093	-1.818	coeff	-0.636	-0.005	0.063	-0.084	-1.646
	t-stat	-1.738	-6.384	-5.546	-0.145	-6.475	t-stat	-9.846	-4.744	1.500	-1.568	-7.455	t-stat	-8.565	-3.928	1.381	-1.327	-6.365
gdp	coeff	0.017	-0.007	-0.275	0.004	-1.481	coeff	-1.002	-0.001	0.011	-0.053	-0.061	coeff	-0.972	0.001	0.017	-0.042	0.159
	t-stat	0.103	-6.002	-5.278	0.058	-5.427	t-stat	-5.979	-0.440	0.195	-0.829	-0.219	t-stat	-5.470	0.522	0.301	-0.628	0.533

Panel 8, 1994-2002

	OLS	1	2	3	4	5	FMOLS	1	2	3	4	5	DOLS	1	2	3	4	5
prod3	coeff	-0.186	-0.006	-0.441	0.322	-1.273	coeff	-0.058	-0.002	-0.514	0.503	-0.891	coeff	-0.083	0.003	-0.503	0.507	-0.897
	t-stat	-2.228	-8.414	-	4.852	-4.326	t-stat	-0.677	-2.447	-	7.357	-2.944	t-stat	-0.908	4.056	-	6.994	-2.793
				13.268						15.045						13.894		
Gdp	coeff	-0.331	-0.005	-0.417	0.343	-1.016	coeff	-0.008	-0.003	-0.509	0.502	-0.914	coeff	-0.173	0.004	-0.501	0.524	-0.820
	t-stat	-2.957	-8.452	-	5.595	-3.534	t-stat	-0.072	-4.624	-	7.974	-3.092	t-stat	-1.419	5.428	-	7.844	-2.616
				13.427						15.963						14.797		

Panel 8, 1995-2002

	OLS	1	2	3	4	5	FMOLS	1	2	3	4	5	DOLS	1	2	3	4	5
prod1	coeff	-0.078	-0.010	-0.435	0.223	-1.353	coeff	-0.132	0.000	-0.500	0.562	-1.082	coeff	-0.086	0.005	-0.493	0.546	-0.863
	t-stat	-1.079	-7.455	-8.906	3.431	-4.928	t-stat	-1.768	-0.261	-9.912	8.393	-3.819	t-stat	-1.073	3.445	-9.130	7.635	-2.848
prod3	coeff	-0.118	-0.009	-0.406	0.175	-1.356	coeff	-0.106	0.000	-0.502	0.511	-0.977	coeff	-0.058	0.005	-0.503	0.511	-0.832
	t-stat	-1.470	-7.391	-8.420	2.779	-5.013	t-stat	-1.280	-0.254	-	7.847	-3.501	t-stat	-0.656	3.347	-9.449	7.338	-2.787
										10.078								
gdp	coeff	-0.269	-0.009	-0.356	0.162	-1.183	coeff	-0.131	0.001	-0.494	0.524	-0.918	coeff	-0.169	0.006	-0.501	0.533	-0.769
	t-stat	-2.127	-7.002	-7.645	2.684	-4.432	t-stat	-1.007	0.449	-	8.409	-3.334	t-stat	-1.212	4.393	-9.751	8.007	-2.613
										10.281								

Panel 9, 1995-2002

	OLS	1	2	3	4	5	FMOLS	1	2	3	4	5	DOLS	1	2	3	4	5
prod1	coeff	-0.070	-0.008	-0.462	0.236	-1.244	coeff	-0.130	-0.001	-0.502	0.561	-1.054	coeff	-0.086	0.004	-0.482	0.552	-0.845
	t-stat	-0.970	-7.036	-9.438	3.705	-4.691	t-stat	-1.758	-0.540	-9.932	8.527	-3.850	t-stat	-1.079	3.430	-8.932	7.855	-2.889
prod3	coeff	-0.120	-0.008	-0.431	0.195	-1.229	coeff	-0.096	-0.001	-0.504	0.508	-0.961	coeff	-0.054	0.004	-0.489	0.517	-0.811
	t-stat	-1.520	-7.013	-8.914	3.136	-4.694	t-stat	-1.181	-0.643	-	7.912	-3.557	t-stat	-0.617	3.217	-9.164	7.533	-2.809
										10.102								
gdp	coeff	-0.329	-0.007	-0.361	0.180	-1.019	coeff	-0.124	0.000	-0.495	0.523	-0.918	coeff	-0.101	0.004	-0.486	0.531	-0.766
	t-stat	-2.755	-6.905	-7.891	3.094	-4.022	t-stat	-1.004	-0.139	-	8.705	-3.508	t-stat	-0.765	3.674	-9.617	8.264	-2.739
										10.476								

Equation 4: RERCPI=f(PROD,INTCPI,FDEBT)

Panel 5, 1993-2002

	OLS	1	2	3	FMOLS	1	2	3	DOLS	1	2	3
prod1	coeff	-0.7934	-0.0058	-0.190	Coeff	-0.728	-0.005	-0.242	coeff	-0.670	-0.004	-0.220
	t-stat	-7.7974	-5.1006	-4.141	t-stat	-6.974	-3.952	-5.142	t-stat	-6.093	-3.292	-4.428
prod2	coeff	-0.8269	-0.0048	-0.149	Coeff	-0.750	-0.005	-0.191	coeff	-0.705	-0.005	-0.180
	t-stat	-8.8879	-4.5287	-3.484	t-stat	-7.857	-4.567	-4.361	t-stat	-7.010	-4.181	-3.885
prod3	coeff	-0.8101	-0.0077	-0.099	Coeff	-0.791	-0.006	-0.155	coeff	-0.556	-0.004	-0.114
	t-stat	-5.8237	-4.5581	-1.383	t-stat	-5.546	-3.360	-2.102	t-stat	-3.700	-2.283	-1.471
gdp	coeff	-1.0369	-0.0038	-0.021	Coeff	-1.029	-0.002	-0.054	coeff	-1.021	-0.001	-0.043
	t-stat	-6.2781	-2.7168	-0.377	t-stat	-6.075	-1.212	-0.943	t-stat	-5.715	-0.658	-0.705

Panel 5, 1994-2002

	OLS	1	2	3	FMOLS	1	2	3	DOLS	1	2	3
prod1	coeff	-0.8893	-0.0062	-0.176	Coeff	-0.726	-0.006	-0.242	coeff	-0.633	-0.005	-0.215
	t-stat	-8.9449	-4.2028	-3.988	t-stat	-7.102	-4.096	-5.325	t-stat	-5.839	-3.230	-4.459
prod2	coeff	-0.9237	-0.0057	-0.124	Coeff	-0.738	-0.007	-0.190	coeff	-0.687	-0.006	-0.179
	t-stat	-10.3677	-4.2976	-3.084	t-stat	-8.058	-4.937	-4.602	t-stat	-7.069	-4.365	-4.086
prod3	coeff	-0.8371	-0.0084	-0.112	Coeff	-0.770	-0.009	-0.156	coeff	-0.490	-0.005	-0.106
	t-stat	-5.6346	-3.4413	-1.456	t-stat	-5.037	-3.461	-1.978	t-stat	-3.022	-1.997	-1.267
gdp	coeff	-1.1707	-0.0054	0.000	Coeff	-1.005	-0.003	-0.056	coeff	-1.011	-0.001	-0.042
	t-stat	-6.8082	-2.8296	0.000	t-stat	-5.682	-1.406	-0.931	t-stat	-5.391	-0.534	-0.656

Panel 8, 1994-2002

	OLS	1	2	3	FMOLS	1	2	3	DOLS	1	2	3
prod3	coeff	-0.6878	-0.0058	-0.212	coeff	-0.696	0.003	-0.365	coeff	-0.425	0.003	-0.330
	t-stat	-5.4996	-5.6882	-5.183	t-stat	-5.409	2.720	-8.693	t-stat	-3.118	2.427	-7.416
gdp	coeff	-0.8858	-0.0058	-0.165	coeff	-0.595	0.003	-0.369	coeff	-0.207	0.002	-0.346
	t-stat	-5.5057	-6.1778	-4.147	t-stat	-3.593	2.902	-9.026	t-stat	-1.181	1.591	-7.987

Panel 8, 1995-2002

	OLS	1	2	3	FMOLS	1	2	3	DOLS	1	2	3
prod1	coeff	-0.6474	-0.0055	-0.249	coeff	-0.707	0.003	-0.402	coeff	-0.556	0.002	-0.373
	t-stat	-7.5219	-3.1269	-7.702	t-stat	-7.955	1.736	-12.026	t-stat	-5.852	0.977	-10.449
prod3	coeff	-0.6318	-0.0066	-0.177	coeff	-0.722	0.004	-0.365	coeff	-0.408	0.004	-0.324
	t-stat	-5.0595	-3.2539	-4.416	t-stat	-5.600	2.101	-8.826	t-stat	-2.964	1.983	-7.312
gdp	coeff	-0.998	-0.0065	-0.086	coeff	-0.664	0.007	-0.365	coeff	-0.110	0.003	-0.336
	t-stat	-5.8561	-3.6108	-2.269	t-stat	-3.777	3.521	-9.290	t-stat	-0.585	1.524	-7.997

Panel 9, 1995-2002

	OLS	1	2	3	FMOLS	1	2	3	DOLS	1	2	3
prod1	coeff	-0.5703	-0.0084	-0.213	coeff	-0.617	0.007	-0.376	coeff	-0.404	0.010	-0.333
	t-stat	-6.6421	-5.4278	-6.868	t-stat	-6.965	4.572	-11.761	t-stat	-4.266	5.741	-9.738
prod3	coeff	-0.5866	-0.0081	-0.158	coeff	-0.662	0.008	-0.342	coeff	-0.345	0.011	-0.297
	t-stat	-4.9495	-4.7693	-4.275	t-stat	-5.411	4.455	-8.967	t-stat	-2.635	5.821	-7.288
gdp	coeff	-1.0057	-0.0071	-0.070	coeff	-0.689	0.009	-0.335	coeff	-0.307	0.011	-0.302
	t-stat	-6.4166	-4.9067	-2.023	t-stat	-4.257	5.870	-9.324	t-stat	-1.772	6.558	-7.867

Equation 5: RERCPI=f(PROD,INTCPI,REG,FDEBT)

Panel 5, 1993-2002

	OLS	1	2	3	4	FMOLS	1	2	3	4	DOLS	1	2	3	4
prod1	coeff	-0.6145	-0.006	-0.071	-0.165	coeff	-0.643	-0.0046	-0.031	-0.238	coeff	-0.609	-0.005	0.0066	-0.198
	t-stat	-4.831	-5.274	-1.403	-3.741	t-stat	-4.932	-4.0892	-0.592	-5.257	t-stat	-4.430	-4.200	0.1194	-4.159
prod2	coeff	-0.8133	-0.005	0.001	-0.145	coeff	-0.799	-0.0053	0.023	-0.197	coeff	-0.737	-0.006	0.0464	-0.163
	t-stat	-6.3268	-4.741	0.013	-3.504	t-stat	-6.058	-5.0602	0.423	-4.646	t-stat	-5.301	-5.393	0.8286	-3.632
prod3	coeff	-0.1402	-0.006	-0.261	-0.096	coeff	-0.272	-0.0037	-0.207	-0.151	coeff	-0.268	-0.004	-0.1461	-0.119
	t-stat	-1.2448	-4.896	-5.354	-1.806	t-stat	-2.353	-2.8921	-4.132	-2.777	t-stat	-2.200	-3.010	-2.7709	-2.077
Gdp	coeff	-0.5801	-0.005	-0.144	-0.049	coeff	-0.985	-0.0016	-0.017	-0.057	coeff	-0.932	-0.002	-0.0024	-0.038
	t-stat	-2.6032	-3.529	-2.201	-0.949	t-stat	-4.312	-1.1633	-0.250	-1.078	t-stat	-3.870	-1.345	-0.0344	-0.680

Panel 5, 1994-2002

	OLS	1	2	3	4	FMOLS	1	2	3	4	DOLS	1	2	3	4
prod1	coeff	-0.5752	-0.007	-0.140	-0.130	coeff	-0.706	-0.0062	-0.008	-0.238	coeff	-0.641	-0.005	0.0403	-0.192
	t-stat	-4.3571	-4.903	-2.457	-3.043	t-stat	-5.199	-4.227	-0.139	-5.410	t-stat	-4.448	-3.443	0.6493	-4.115
prod2	coeff	-0.7627	-0.006	-0.065	-0.109	coeff	-0.855	-0.0077	0.050	-0.196	coeff	-0.758	-0.007	0.071	-0.157
	t-stat	-5.7615	-4.638	-1.134	-2.684	t-stat	-6.278	-5.5289	0.852	-4.718	t-stat	-5.250	-4.739	1.1416	-3.550
prod3	coeff	-0.0102	-0.009	-0.371	-0.079	coeff	-0.257	-0.0049	-0.204	-0.147	coeff	-0.268	-0.003	-0.1287	-0.109
	t-stat	-0.0997	-5.515	-7.591	-1.591	t-stat	-2.432	-3.0175	-4.060	-2.900	t-stat	-2.394	-1.922	-2.4125	-2.017
gdp	coeff	-0.3278	-0.008	-0.281	-0.041	coeff	-0.984	-0.0022	-0.009	-0.055	coeff	-0.921	-0.001	0.0044	-0.029
	t-stat	-1.5629	-4.587	-4.217	-0.840	t-stat	-4.562	-1.303	-0.132	-1.098	t-stat	-4.024	-0.619	0.0606	-0.539

Panel 8, 1994-2002

	OLS	1	2	3	4	FMOLS	1	2	3	4	DOLS	1	2	3	4
prod3	coeff	-0.0334	-0.004	-0.353	-0.164	coeff	0.033	-0.001	-0.327	-0.216	coeff	-0.021	0.001	-0.3386	-0.215
	t-stat	-0.3668	-5.652	-10.241	-5.407	t-stat	0.349	-1.3647	-9.227	-6.896	t-stat	-0.211	1.127	-9.0014	-6.484
gdp	coeff	-0.1126	-0.004	-0.329	-0.158	coeff	0.292	-0.0035	-0.368	-0.215	coeff	0.231	-0.001	-0.3585	-0.216
	t-stat	-0.8734	-5.739	-9.602	-5.043	t-stat	2.200	-4.5929	-10.442	-6.700	t-stat	1.641	-0.873	-9.6042	-6.327

Panel 8, 1995-2002

	OLS	1	2	3	4	FMOLS	1	2	3	4	DOLS	1	2	3	4
prod1	coeff	-0.1059	-0.006	-0.353	-0.148	coeff	0.100	-0.0008	-0.344	-0.206	coeff	0.153	0.000	-0.3891	-0.193
	t-stat	-1.3636	-4.283	-6.322	-5.183	t-stat	1.243	-0.5361	-5.981	-6.995	t-stat	1.789	0.036	-6.3212	-6.146
prod3	coeff	0.0193	-0.006	-0.408	-0.138	coeff	-0.001	-0.0002	-0.318	-0.218	coeff	-0.050	0.001	-0.3437	-0.215
	t-stat	0.2132	-4.424	-7.881	-4.752	t-stat	-0.012	-0.1348	-5.947	-7.281	t-stat	-0.499	0.529	-6.0234	-6.720
gdp	coeff	-0.2112	-0.006	-0.341	-0.114	coeff	0.255	-0.0031	-0.362	-0.217	coeff	0.246	-0.001	-0.3635	-0.214
	t-stat	-1.4318	-4.402	-6.387	-3.796	t-stat	1.675	-2.1533	-6.568	-7.008	t-stat	1.511	-0.629	-6.1777	-6.461

Panel 9, 1995-2002

	OLS	1	2	3	4	FMOLS	1	2	3	4	DOLS	1	2	3	4
prod1	coeff	-0.0307	-0.007	-0.391	-0.126	coeff	0.252	-0.0008	-0.405	-0.166	coeff	0.254	0.000	-0.4304	-0.166
	t-stat	-0.4189	-5.598	-7.273	-4.862	t-stat	3.329	-0.6395	-7.301	-6.193	t-stat	3.134	0.032	-7.2507	-5.791
prod3	coeff	0.049	-0.007	-0.420	-0.129	coeff	0.108	0.0004	-0.360	-0.191	coeff	0.036	0.001	-0.3895	-0.192
	t-stat	0.5702	-5.504	-8.343	-4.800	t-stat	1.216	0.3256	-6.921	-6.870	t-stat	0.378	0.583	-7.0112	-6.473
gdp	coeff	-0.2255	-0.006	-0.341	-0.100	coeff	0.291	-0.0012	-0.389	-0.191	coeff	0.237	0.000	-0.4046	-0.191
	t-stat	-1.6441	-5.606	-6.647	-3.588	t-stat	2.054	-1.0069	-7.348	-6.615	t-stat	1.563	0.158	-7.152	-6.193

Equation 6: RERCPI=f(PROD,INTCPI,REG,GOV)

Panel 5, 1993-2002

	OLS	1	2	3	4	FMOLS	1	2	3	4	DOLS	1	2	3	4
prod1	coeff	-0.3492	-0.004	-0.113	-1.288	coeff	-0.184	-0.0041	-0.147	-1.214	coeff	-0.268	-0.005	-0.0692	-1.016
	t-stat	-2.8195	-4.379	-2.531	-4.218	t-stat	-1.445	-3.9486	-3.188	-3.878	t-stat	-2.000	-4.292	-1.428	-3.079
prod2	coeff	-0.6319	-0.004	-0.018	-1.171	coeff	-0.634	-0.0055	0.015	-1.210	coeff	-0.679	-0.007	0.0811	-1.071
	t-stat	-5.5148	-4.205	-0.425	-4.456	t-stat	-5.396	-6.0129	0.340	-4.489	t-stat	-5.481	-6.767	1.7334	-3.768
prod3	coeff	-0.3149	-0.004	-0.129	-1.498	coeff	-0.647	-0.0038	0.007	-1.763	coeff	-0.613	-0.004	0.0136	-1.696
	t-stat	-3.8632	-4.279	-3.244	-5.480	t-stat	-7.736	-3.7645	0.181	-6.290	t-stat	-6.950	-3.505	0.3173	-5.739
Gdp	coeff	-0.4114	-0.004	-0.131	-1.009	coeff	-0.964	-0.0009	-0.023	-0.063	coeff	-0.969	-0.001	-0.0036	0.030
	t-stat	-2.2704	-3.688	-2.561	-3.395	t-stat	-5.188	-0.8207	-0.436	-0.208	t-stat	-4.947	-0.494	-0.0655	0.094

Panel 5, 1994-2002

	OLS	1	2	3	4	FMOLS	1	2	3	4	DOLS	1	2	3	4
prod1	coeff	-0.3702	-0.006	-0.141	-1.411	coeff	-0.288	-0.005	-0.108	-1.341	coeff	-0.298	-0.005	-0.0382	-0.931
	t-stat	-3.4191	-5.436	-3.252	-5.527	t-stat	-2.589	-4.326	-2.425	-5.104	t-stat	-2.523	-3.679	-0.8079	-3.342
prod2	coeff	-0.5697	-0.006	-0.067	-1.293	coeff	-0.735	-0.0077	0.060	-1.328	coeff	-0.725	-0.008	0.1185	-1.047
	t-stat	-5.631	-5.502	-1.608	-5.761	t-stat	-7.067	-7.5295	1.418	-5.750	t-stat	-6.572	-7.215	2.6236	-4.274
prod3	coeff	-0.1309	-0.007	-0.231	-1.533	coeff	-0.639	-0.0048	0.008	-1.803	coeff	-0.608	-0.004	0.0173	-1.680
	t-stat	-1.8558	-6.024	-6.044	-6.210	t-stat	-8.803	-4.037	0.214	-7.101	t-stat	-7.901	-3.179	0.4154	-6.238
gdp	coeff	-0.0148	-0.007	-0.265	-1.454	coeff	-0.982	-0.0003	-0.017	-0.089	coeff	-0.956	0.001	-0.0044	0.102
	t-stat	-0.0901	-5.688	-5.332	-5.250	t-stat	-5.803	-0.2144	-0.334	-0.314	t-stat	-5.328	0.672	-0.081	0.337

Panel 8, 1994-2002

	OLS	1	2	3	4	FMOLS	1	2	3	4	DOLS	1	2	3	4
prod3	coeff	-0.184	-0.007	-0.349	-1.381	coeff	0.116	-0.002	-0.500	-0.330	coeff	0.046	0.003	-0.5333	-0.529
	t-stat	-2.1466	-9.867	-10.098	-4.414	t-stat	1.313	-2.7541	-14.071	-1.025	t-stat	0.488	3.907	-14.1628	-1.549
gdp	coeff	-0.2488	-0.007	-0.335	-1.202	coeff	0.473	-0.0055	-0.539	-0.681	coeff	0.308	0.001	-0.5465	-0.678
	t-stat	-2.1599	-10.235	-10.314	-3.939	t-stat	3.989	-8.0676	-16.129	-2.168	t-stat	2.455	1.366	-15.4281	-2.036

Panel 8, 1995-2002

	OLS	1	2	3	4	FMOLS	1	2	3	4	DOLS	1	2	3	4
prod1	coeff	0.0293	-0.011	-0.379	-1.532	coeff	0.609	-0.0032	-0.596	-0.311	coeff	0.676	0.001	-0.6313	-0.249
	t-stat	0.4044	-8.634	-7.897	-5.468	t-stat	8.147	-2.4346	-12.050	-1.075	t-stat	8.449	0.714	-11.9353	-0.804
prod3	coeff	-0.1541	-0.011	-0.314	-1.537	coeff	0.050	-0.0002	-0.482	-0.447	coeff	0.053	0.004	-0.544	-0.556
	t-stat	-1.8866	-8.396	-6.741	-5.563	t-stat	0.597	-0.1672	-10.023	-1.568	t-stat	0.586	2.746	-10.5729	-1.824
gdp	coeff	-0.2951	-0.010	-0.273	-1.344	coeff	0.396	-0.0038	-0.526	-0.747	coeff	0.367	0.001	-0.5554	-0.705
	t-stat	-2.3208	-8.008	-5.836	-4.918	t-stat	3.017	-3.018	-10.914	-2.645	t-stat	2.619	0.718	-10.7719	-2.337

Panel 9, 1995-2002

	OLS	1	2	3	4	FMOLS	1	2	3	4	DOLS	1	2	3	4
prod1	coeff	0.0384	-0.009	-0.404	-1.421	coeff	0.508	-0.0044	-0.572	-0.439	coeff	0.587	0.000	-0.5685	-0.261
	t-stat	0.5286	-8.202	-8.289	-5.178	t-stat	6.782	-3.7476	-11.379	-1.549	t-stat	7.321	-0.034	-10.5757	-0.862
prod3	coeff	-0.1488	-0.009	-0.336	-1.390	coeff	0.046	-0.0012	-0.482	-0.441	coeff	0.052	0.002	-0.5064	-0.483
	t-stat	-1.8375	-8.175	-7.075	-5.130	t-stat	0.552	-1.0013	-9.832	-1.578	t-stat	0.577	1.553	-9.6633	-1.615
gdp	coeff	-0.3533	-0.009	-0.274	-1.168	coeff	0.366	-0.0034	-0.523	-0.734	coeff	0.407	0.000	-0.5349	-0.693
	t-stat	-2.9048	-8.022	-5.861	-4.413	t-stat	2.919	-3.1112	-10.821	-2.687	t-stat	3.036	0.158	-10.3622	-2.373

Equation 7: RERCPI=f(PROD,INTCPI,REG,OPEN)

Panel 5, 1993-2002

	OLS	1	2	3	4	FMOLS	1	2	3	4	DOLS	1	2	3	4
prod1	coeff	-0.4879	-0.007	-0.206	0.118	coeff	-0.028	-0.0032	-0.291	-0.006	coeff	-0.197	-0.004	-0.1469	0.031
	t-stat	-3.2833	-5.166	-3.337	1.331	t-stat	-0.182	-2.5075	-4.600	-0.061	t-stat	-1.228	-2.866	-2.2067	0.326
prod2	coeff	-0.8495	-0.006	-0.102	0.201	coeff	-0.817	-0.0039	-0.108	0.207	coeff	-0.823	-0.005	0.0074	0.195
	t-stat	-5.8855	-4.980	-1.722	2.518	t-stat	-5.517	-3.3903	-1.766	2.519	t-stat	-5.273	-3.868	0.115	2.259
prod3	coeff	-0.2456	-0.006	-0.235	-0.078	coeff	-0.476	-0.0045	-0.121	-0.162	coeff	-0.400	-0.005	-0.0493	-0.129
	t-stat	-2.1642	-4.684	-4.150	-0.849	t-stat	-4.086	-3.3648	-2.079	-1.715	t-stat	-3.263	-3.376	-0.806	-1.302
gdp	coeff	-0.6884	-0.004	-0.098	-0.084	coeff	-1.120	-0.001	0.038	-0.079	coeff	-0.981	-0.001	0.0252	-0.057
	t-stat	-3.0542	-3.182	-1.394	-0.943	t-stat	-4.843	-0.6948	0.521	-0.865	t-stat	-4.025	-0.842	0.3305	-0.585

Panel 5, 1994-2002

	OLS	1	2	3	4	FMOLS	1	2	3	4	DOLS	1	2	3	4
prod1	coeff	-0.4675	-0.008	-0.276	0.123	coeff	-0.084	-0.0044	-0.270	-0.014	coeff	-0.273	-0.002	-0.0967	0.059
	t-stat	-3.2036	-5.057	-4.189	1.475	t-stat	-0.557	-2.7495	-3.987	-0.167	t-stat	-1.715	-1.224	-1.3441	0.652
prod2	coeff	-0.7727	-0.007	-0.171	0.175	coeff	-0.857	-0.0057	-0.081	0.184	coeff	-0.826	-0.004	0.0415	0.192
	t-stat	-5.3686	-4.834	-2.656	2.258	t-stat	-5.787	-3.862	-1.228	2.314	t-stat	-5.263	-2.544	0.5911	2.284
prod3	coeff	-0.0517	-0.009	-0.397	0.021	coeff	-0.449	-0.0066	-0.114	-0.173	coeff	-0.383	-0.004	-0.0277	-0.123
	t-stat	-0.511	-5.581	-6.943	0.243	t-stat	-4.314	-4.0317	-1.932	-1.961	t-stat	-3.468	-2.100	-0.4451	-1.319
gdp	coeff	-0.3639	-0.008	-0.281	-0.010	coeff	-1.100	-0.0015	0.046	-0.092	coeff	-0.940	0.000	0.0177	-0.042
	t-stat	-1.6919	-4.493	-3.798	-0.109	t-stat	-4.974	-0.8412	0.604	-1.023	t-stat	-4.005	0.061	0.2201	-0.436

Panel 8, 1994-2002

	OLS	1	2	3	4	FMOLS	1	2	3	4	DOLS	1	2	3	4
prod3	coeff	-0.2344	-0.005	-0.536	0.368	coeff	-0.082	-0.0022	-0.549	0.454	coeff	-0.062	0.003	-0.5097	0.481
	t-stat	-2.3548	-6.244	-14.171	4.633	t-stat	-0.800	-2.7104	-14.121	5.566	t-stat	-0.570	3.672	-12.3545	5.561
gdp	coeff	-0.5201	-0.005	-0.449	0.385	coeff	-0.174	-0.0023	-0.521	0.491	coeff	-0.247	0.004	-0.4966	0.515
	t-stat	-4.2814	-6.503	-12.872	5.483	t-stat	-1.391	-3.1297	-14.502	6.803	t-stat	-1.865	5.643	-13.0437	6.717

Panel 8, 1995-2002

	OLS	1	2	3	4	FMOLS	1	2	3	4	DOLS	1	2	3	4
prod1	coeff	-0.0529	-0.008	-0.619	0.349	coeff	0.139	-0.0022	-0.580	0.393	coeff	0.137	0.005	-0.5182	0.428
	t-stat	-0.6145	-5.368	-11.048	4.554	t-stat	1.562	-1.4097	-10.016	4.962	t-stat	1.442	2.836	-8.3763	5.060
prod3	coeff	-0.1035	-0.008	-0.591	0.315	coeff	-0.110	-0.0008	-0.543	0.460	coeff	-0.025	0.006	-0.4965	0.495
	t-stat	-1.0664	-5.243	-10.636	4.169	t-stat	-1.101	-0.4848	-9.467	5.902	t-stat	-0.232	3.375	-8.1	5.940
gdp	coeff	-0.4681	-0.007	-0.437	0.266	coeff	-0.310	0.0022	-0.504	0.519	coeff	-0.223	0.008	-0.4859	0.529
	t-stat	-3.3268	-4.789	-8.081	3.818	t-stat	-2.135	1.4566	-9.033	7.220	t-stat	-1.437	4.707	-8.1413	6.878

Panel 9, 1995-2002

	OLS	1	2	3	4	FMOLS	1	2	3	4	DOLS	1	2	3	4
prod1	coeff	-0.0813	-0.007	-0.627	0.352	coeff	0.021	-0.0027	-0.565	0.437	coeff	0.066	0.005	-0.495	0.464
	t-stat	-0.98	-4.868	-11.392	4.766	t-stat	0.244	-1.9489	-9.937	5.733	t-stat	0.718	3.287	-8.1495	5.693
prod3	coeff	-0.1546	-0.006	-0.584	0.304	coeff	-0.142	-0.0013	-0.536	0.457	coeff	-0.041	0.005	-0.4857	0.497
	t-stat	-1.6757	-4.821	-10.740	4.188	t-stat	-1.490	-0.9392	-9.552	6.094	t-stat	-0.403	3.636	-8.0972	6.194
gdp	coeff	-0.5165	-0.006	-0.425	0.257	coeff	-0.305	0.0005	-0.505	0.516	coeff	-0.179	0.006	-0.4742	0.526
	t-stat	-4.042	-4.886	-8.237	3.923	t-stat	-2.308	0.4411	-9.482	7.628	t-stat	-1.266	4.516	-8.3349	7.276