The bilateral J-Curve hypothesis between Turkey and her 9 trading partners

Kimbugwe, Hassan

University of Greenwich

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000335602 **Hassan Kimbugwe**

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THE BILATERAL J-CURVE HYPOTHESIS BETWEEN TURKEY AND HER 9 TRADING PARTNERS

SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE MSC. IN BUSINESS AND FINANCIAL ECONOMICS

SUBMITTED BY: HASSAN KIMBUGWE

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ABSTRACT

Applying ARDL Cointegration, Johansen modelling and generalised impulse response function analyses in this paper, we provide new evidence for the Turkish Bilateral J-curve hypothesis in the short and long-run using both annual aggregated and disaggregated data over 1960 and 2000 period between Turkey and 9 of her major trading partners. We adopt model that models the real trade balance directly as a function of real exchange rate and real domestic and foreign incomes to test for existence of any cointegration relationship and J-curve pattern. We apply the impulse response function analysis to determine whether shocks to real exchange rate induce the trade balance to follow the J-curve pattern.

The results indicate that there is cointegration relationship between the above variables. We were unable to find any support for Turkish bilateral J-Curve hypothesis. However the generalised impulse response functions reveal that in some cases depreciation of the Turkish lira seems to improve the trade balance beyond the equilibrium level in the long-run.

Key wards: J-curve hypothesis, balance of trade, generalised impulse response function, Error Correction Model VAR model.

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LIST OF ABBREVIATIONS

ADF	Augmented Dickey Fuller
AIC	Akaike Information Criterion
ARDL	Autoregressive Distributed Lagged
CBRT	Central Bank of the Republic of Turkey
ECM	Error Correction Model
GDP	Gross Domestic Product
SBC	Schwarz Bayesian Criterion
VECM	Vector Error Correction Model

1.0 INTRODUCTION

For effective and successful policy making in any economy, it's relevant to understand the relationship between terms of trade and trade balance. This is because terms of trade reflect the international level of competitiveness of a country. Terms of trade are defined as the ratio of export prices over import prices hence terms of trade indicate the number units of imports that can be purchased by a single unit of exports. Thus a decline in terms of trade would imply loss of competitiveness. Bahamni-Oskooee and Ratha (2004) give an example that due to increase in import prices of manufactured goods from industrialised countries in the 1970s, Organisation of Petroleum Exporting Countries (OPEC) nations experienced deteriorations in terms of trade. To overcome this deterioration in terms of trade they raised the price of their exports that is price of oil. Therefore changes in terms of trade and sources of these changes are of great importance to policy makers in any economy. Devaluation of currency is considered to be one of major source that causes changes in a country's terms of trade.

The impact of devaluation of currency on the trade balance was initially empirically analysed by estimating the Marshall-Lerner condition. This condition asserts that if the absolute values of the export and import demand elasticities sum up to more than unity then a currency devaluation improves the trade balance in the long-run. However Bahmani-Oskooee (1985) provided empirical evidence that even if the ML condition is met, the trade balance may continue to deteriorate.

Economic theory further advocates that because of the lag structure, currency devaluation worsens the trade balance first and improves it later resulting in a pattern that J. Magee (1973) labelled the J-curve phenomenon because it resembles letter J. J. Magee (1973) argues that after devaluation contracts that are in transit at old exchange rate dominate the short-run response of the trade balance. Over time new contracts at new prices begin to exact their favourable impact hence elasticises may increase thus improving the trade balance.

Empirical researches of the J-curve hypothesis have been intensive in the last three decades. As regards to Turkey previous studies were based on the only aggregate data and they reveal mixed results.

Hence the main reasons for undertaking this research is that almost all the present researches are concentrated on testing the J-curve hypotheses for large developing economies based on aggregate data. However the convectional wisdom regarding the validity of any theory is that it gains popularity and greater acceptance if it is empirically tested in countries of various sizes and structures. Thus we provide new evidence of the Turkish J-curve using both aggregate and disaggregated data.

Another reason is that the J-curve phenomenon is also associated with the question as to whether devaluation improves the trade balance in the long-run thus our objective is to find out if it does for the case of Turkey and her major trading partners. If the J-curve does improve the Turkish trade balance then the speed of adjustment is crucially important.

We organise the rest of the research as follows; we provide a brief account of the Turkish Foreign trade, in chapter two we review and debate the existing literature review of the J-curve phenomenon and try to relate it with our study. In chapter three we outline the different analyses that we apply to test the J-curve hypothesis. In chapter four we provide empirical results with their interpretation. In chapter five we provide conclusions basing on our findings and give policy recommendations as per our findings. In the appendices we include data sources and definitions, data, references and Microfit printouts for the results.

1.1 Turkey's Foreign Trade

In this section we provide a brief overview of the Turkish foreign trade. According to Krueger and Aktan (1992) in the 1960s and 1970s, the main economic development strategy of Turkey was import substitution policy. They argue that during this period, intensive public investment programs that aimed at expanding the domestic production capacity in heavy manufacturing and capital goods were very popular.

According to Ertugrul and Selcuk (2001) heavy protection via quantitative restrictions along with a fixed exchange rate regime for foreign trade was the order of the day in late 1960s that, on the average, foreign trade was overvalued given the purchasing power parity. Import substitution strategy heavily relied on imported raw materials. This led to a deterioration of Turkey's terms of trade after the first oil shock in the 1973-1974.

Ertugrul and Selcuk (2001) further state that this deterioration caused a deficit in balance of payments that was compensated by short-term borrowing. Inadequate measures taken to overcome the crisis, as well as the negative effects of the second oil shock in 1979 deepened the crisis. Turkey hence initiated trade liberalization process to overcome the unresolved 1977-1979 balance of payments crisis in an environment of low domestic savings and sluggish investment.

According to Togan (1996) and Ertugrul and Selcuk (2001) Turkish economy has experienced relatively high inflation and unsuccessful disinflation programs in the past thirty years. Although yearly inflation was over 100 percent in certain years, it never reached to hyperinflationary levels, but increased in a stepwise fashion by the time. An average annual inflation rate of 20 percent in the 1970s, 35 to 40 percent in the early 1980s, 60 to 65 percent in the late 1980s and early 1990s, and around 80 percent before the government launched yet another disinflationary program in 1998.

To reduce inflation, to fill in the foreign financing gap, and to attain a more outward oriented and market-based economic system, on the 24th of January 1980, decisions were announced. Within the framework of these decisions, export subsidies were granted and exchange rates were allowed to depreciate in real terms to make Turkish exports more competitive, which would lead to the promotion of export-led growth hence improvement in the terms of trade.

According to Krueger and Aktan (1992) and Ertugrul and Selcuk (2001) the 1980 economic program comprised of export subsidies, a high devaluation and price increases for goods and services produced by the State Economic Enterprises. According to Yeldan (1997) the initial “big push” in the exchange rate, interest rates and administrated public product prices were coupled with quickly implemented heterodox export incentive schemes. These initial moves also proved to be helpful in regaining the confidence of international creditors. According to Ertugrul and Selcuk (2001) foreign direct investment (net) was extremely low until 1988. They assert that since then, there was a surge in foreign direct investment, reaching $800 million in 1992 from $100 million in 1987. The foreign direct investment averaged $600 million between 1993 and 1998 and became low again during the last two years as a result of long-term capital outflows (investment by domestic residents abroad). They conclude by asserting that Turkish economy has not been able to attract significant foreign direct investment for the last twenty years. The total foreign direct investment during the last fifteen years was $7.7 billion, roughly equivalent to total long-term borrowing by the private sector (excluding banks) in just one year (1999). The ratio of total exports to gross domestic product (GDP) increased from 4.1 t0 13.3 percent. According to the national income statistics, the external deficit was 5 percent of the GDP in 1995 and approximately 6 percent in 1996 and 1997. According to Ertugrul and Selcuk (2001) the external deficits in 1998 and 1999 were relatively low, this was due to extremely high real interest rates after the Russian crisis and a shrink in total demand. They show that the total exports were stagnant since 1996, around $26 billion, and the total imports were dominating the current account dynamics.

1.2 Bilateral Trade flow between Turkey and her major trading partners

In this section we provide the bilateral trade flow between Turkey and her major trading partners. The nine trading partners that are selected are the largest partners of Turkey with total exports accounting for 54.5% and total imports accounting for 56.6% for the Turkish trade. Table 1 reports Turkish trade share with these trading partners.

Table 1 Turkey's trade with her major trading partners in 2000 ($ US m)

Trading partners	Value of Exports ($ US m)	Value of Imports ($ US m)
Austria	375.47	614.10
Belgium	800.14	1251.36
England	1150.25	2644.12
France	1658.47	3015.53
Germany	6582.58	7445.13
Holland	2015.56	1360.58
Italy	1978.45	3987.13
Switzerland	302.80	960.26
USA	2674.12	3750.15
∑ Trading Partners	17537.84	25028.36
World	32154.50	44258.10

Source: Direction of Trade Statistics, IMF

2.0 LITERATURE REVIEW

J-curve hypothesis literature is divided into two broad categories those using aggregate data and those using bilateral data. In view of this we review almost all the literature on J-curve hypothesis relating it with our study.

2.1 J-Curve Hypothesis Vs Marshall-Lerner (ML)

In the past economist investigated the impact of currency depreciation on the trade balance relying on estimations of the Marshall-Lerner condition. Marshall-Lerner condition requires that for success of devaluation in the long-run the sum of import and export demand elasticities should exceed one. Early work by Bahmani-Oskooee (1986) shows that the import demand elasticities of India added up to more than one indicating that depreciation of the rupee would improve India trade balance in the long-run.

However, proponents of the M-L condition argue that although it provides both the necessary and sufficient conditions for trade balance improvement there have been cases under which these conditions have been met yet the trade balance continued to deteriorate.

Due to this limitation, recently researchers have utilized J-curve phenomenon which employs direct methods that relate a measure of trade balance to the exchange rate and other variables such as money and income. This is due to the fact that though exchange rates may adjust immediately, consumers and producers may take a while to adjust to changes in relative prices hence a short-run deterioration is consistent with a long-run improvement in the trade balance. In response to the J-curve phenomenon Bahmani-Oskooee (1989a) applied the direct method to the case of India and showed that trade balance deteriorates in the short and long-run. Although the M-L conditions where met in the former research, the latter depicts trade balance deterioration with the same country hence we find the J-curve phenomenon more reliable than the M-L condition and we apply it for the case of Turkey.

As mentioned above the J-curve phenomenon is divided into two broad categories these are, those utilising aggregate data and those utilising bilateral data. We review each category separately whilst relating them to our study.

2.2 Aggregate Trade Data

The evidence of the J-curve phenomenon in the short and long-run has been mixed in recent tests. In this section we review papers that employee aggregate trade data in their J-curve analyses.

In his investigation Magee (1973) suggests that increases in domestic real income relative to activity abroad may swap any favourable effects that the devaluation may generate. He suggests that initially contracts already in force in specified currencies dominate the determinants of the current account. This is due to the fact that before any contract is signed, economic agents consider their expectations concerning the future devaluation or appreciation of currencies to make capital gain or to avoid a capital loss. That is exporters will always prefer payment in currencies expected to strengthen whereas importers prefer to make payment in currencies expected to weaken thus the trade balance is expected to deteriorate in the short run.

He asserts that over time, new contracts made after devaluation begin to exact their favourable impact. During the brief period of the pass-through the trade balance may increase because of supply lags thus leading to an improvement in the trade balance in the long-run. However, buying patterns take long to change because prices have to change and the trade balance may get worse during the early periods of quantity adjustments because price effects dominates the volume effects. This delayed response could also be due to lags in the process of increasing the production of exports.

Junz and Rhomberg (1973) identify five lags such as recognition lags, decision lags delivery lags, replacement lags and production lags in support of Magee's findings. They assert that the trade balance can only improve in the long-run once these lags have been considered.

The downside of the above studies as Miles (1979) points suggests is that they don't investigate whether the impact on trade balance is temporary or permanent, nor do they compare post devaluation levels of the accounts with pre-devaluation levels and they don't account for effects of other variables such as the government's monetary or fiscal policy.

In consideration of the above suggestions, Miles (1979) demonstrates that devaluations don't improve the trade balance but improve the balance of payment through capital-gains. He considers government monetary and fiscal polices as well as growth rates in his analysis in which he considered 14 countries using their annual data for a period of (1956-1972). Hence he confirms that devaluation causes a mere portfolio readjustment resulting in a surplus in the capital account.

However Himarios (1985) employs the same model as Miles (1979) and shows that devaluations affect trade balance in the traditionally predicted directions. He suggests that results are sensitive to units of measurements. That domestic and foreign variable may not have the same impact on trade balance. That it is real exchange rate rather than the nominal exchange rate which affect trade flow. We find Himarios (1985) suggestions relevant to our study and we do consider them in the formulation of our model. He finds out that in nine out of the ten cases the cumulative exchange rate is significant at 5% level and has a positive sign thus real devaluation do improve the trade balance.

Bahmani-Oskooee (1985) formulates a model where he defines trade balance as an excess of exports over imports and imposes an Almon lag structure on the exchange rate variable for Greece India Korea and Thailand. He finds evidence of the J-curve for Greece India and Korea.

Bahmani-Oskooee (1989a) redefines the real exchange rate and he asserts that real exchange rate should be defined as the number of units of domestic currency per unit of foreign currency rather than units of foreign currency per units of domestic prices. Thus he set conditions for the J-curve phenomenon that is the exchange rate should have negative coefficients followed by positives one. With these changes he finds that devaluation improves Thailand's trade balance.

Due to inconsistency of OLS estimates, Brissimis and Leventankis (1989) develop a dynamic general equilibrium model that combines the elasticities and monetary approaches to the balance of payments. Employing quarterly data for Greece covering the period 1975 to 1984 and an Almon lag technique they estimate the structural equations of the model and they report presence of J-curve for Greece the duration of initial deterioration being one quarter.

Bahmani-Oskooee and Alse (1994) identify that Mile's first differenced data was stationary whereas levels used by Himarios (1989) were non-stationary therefore they discount the results of the latter as well as that of Bahmani-Oskooee (1985). They define trade balance as the ratio of the country's imports to exports. This helps to express trade balance in unit free terms and to equate the real trade balance with the nominal trade balance. It's on this account that we define our trade balance so as to make it unit free following Bahmani-Oskooee (1985) study.

The drawback of the above studies might have been the use of non-stationary data hence the problem of Spurious regression. In an attempt to solve the problem of spurious regression Bahmani-Oskooee and Pourheydarian, M. (1991) and Bahmani-Oskooee and Alse (1994) applied cointegration analysis to trade data of many developing countries. We adopt cointegration techniques in our study to solve spurious regression.

Using Engle-Granger Cointegration technique on quarterly data from 1971-1990 on the trade balance and real effective rate, they find that the long-run impact of trade balance is positive for Costa Rica, Brazil and Turkey and negative for Ireland. For Canada, Denmark, Germany, Portugal, Spain, Sri Lanka, UK and the USA there is no long-run effect. From the ECM they report occurrence of the J-curve for Costa Rica, Ireland, Netherlands and Turkey. We employ the ECM in order to incorporate the short-run dynamics in our model as suggested by Engle-Granger (1987) since we are testing for both long and short-term J-Curve hypothesis.

In his investigation Backus (1993) examines the evolution of real trade balance for Japan for the period of 1955Q2-1993Q2. He employs VAR technique and impulse response functions which we also utilise and reports the presence of the Japanese J-curve.

Demirden and Pastine (1995) suggest that OLS estimation may not be suitable for a flexible exchange rate regime because exchange rates affect other variables such as income which also influence the trade balance. They argue that since feedback effects cannot be captured in the OLS regressions it is not possible to directly interpret the OLS coefficients on lagged exchange rates as the delayed effect of the exchange rate on the balance of trade. Since Turkey initiated a realistic and flexible exchange rate in January 1980 we find Demirden and Pastine (1995) suggestions useful for the study hence we consider them.

They apply the VAR approach that explicitly endogenizes the variables involved. Since this approach provides a highly flexible estimation environment that might be relevant in case we mis-sepecify the structural model, we adopt Juselius VAR model for the data.

Demirden and Pastine (1995) further suggest impulse response analysis in determining the existence of the J-curve which aids detection of feedback effects in the sample data. However in their research they utilise orthogonal impulse responses that are not unique and change as the order of model variables change. Koop et al (1996) and Pesaran and Shin (1998) develop the method of generalised impulse that are unique and invariant to reordering of variables in the VAR and can be used for both linear and non-linear models. For this reason we employ this methodology in the analysis of the dynamics of the Turkish trade balance.

As regards to the empirical evidence of the Turkish J-curve, Rose (1990) study includes the Turkish data for the period of 1970-1988 add finds out that real exchange rate have no impact on the trade balance. In their investigation Bahmani-Oskooee and Malixi (1992) based on Almon lag structure on the real exchange rate for 13 developing countries including Turkey, didn't find any support for the J-curve hypothesis either. Bahmani-Oskooee and Alse (1994) utilize the cointegration approach and they find that the long-run impact of the Turkish trade balance model is positive. Branda, Kutan and Zhou (1997) for the period of 1969-1993 divide the data into two. 1969-1979 and 1980-1993 and by using a trade balance model that was developed by Rose and Yellen (1989) they find that in the first sample there is no long-run relationship between the trade balance, real exchange rate domestic and foreign incomes. However in the second sample the balance of trade is responsive to the real exchange rate therefore they find that the trade policy change of the 1980's has a significant impact on the Turkish trade balance. The negative results in the first sample might be attributed to the structural break down during that period and due to the fact that researchers employed aggregate date in their analyses.

Pelin, Kale (2001) performs cointegration analysis and finds that the Bickerdike Robinson Metzler (BRM) condition is satisfied depicting that real depreciation leads to an improvement in the Turkish data hence an improvement of the trade balance in the long-run. However he finds out that increase in the domestic income on the other hand adversely affects the trade balance in the long-run.

In a recent study Akbostanci (2004) presents empirical evidence of the J-curve phenomenon in the long run.

However due to the mixed results and the aggregation bias problem associated with these studies, recently studies have employed bilateral trade data between one country and each of her major trading partners. We review papers that have employed bilateral trade.

2.3 Bilateral Trade Data

In the previous section we reviewed several studies that employed aggregate trade data.

However as suggested by Bahmani-Oskooee and Brooks (1999), a country's trade balance could be improving with one trading partner and at the same time deteriorating with another. This can also occur with real exchange rate. Aggregate data on each of these variables could limit the actual movements taking place at bilateral levels. For this reason recent studies on the J-curve, employ bilateral trade data. For this reason we too employ bilateral trade data for the case of Turkey and its nine trading partners.

The tradition was introduced by Rose and Yellen (1989) who investigate the response of the bilateral trade between the USA and each of her large six trading partners and the real bilateral exchange rates for a period of 1963–1988 for US quarterly data. They also use stationary data and test for cointegration amongst the variables of interest. They argue that bilateral analysis is useful because it does not require constructing a proxy for the rest of the world (ROW) income variable, and it helps reduce aggregation bias. Cointegration approach is helpful as it does not require a set of structural equations. They estimate a log-linear variant equation;

$$TB_{jt} = a + b \ln Y_{us,t} + c \ln Y_{jt} + d \ln REX_{jt} + \varepsilon_t \qquad (1)$$

Where TB_{jt} is the US trade balance with country j, measured as net exports to j deflated by the US GNP in j; $Y_{us,t}$ is the US real GNP, Y_{jt} is the real GNP in j and REX_{jt} is the bilateral real exchange rate. We utilise Rose and Yellen ideas in formulation of the Turkish bilateral trade balance model.

They don't find long-run effects and no evidence supporting the J-curve phenomenon. They attribute their failure to potential simultaneity of the trade balance, exchange rate and output as well as presence of unit roots in variables. In view of this we test for presence of unit roots and carry out first differencing to achieve stationarity of variables.

Marwah and Klein (1996) also produce mixed results when they test the phenomenon between Canada and her five largest trading partners as well as USA and her five trading partners.

Using quarterly bilateral trade data from 1977Q1 to 1992Q1, they find evidence of the J-Curves that have the same shape for both Canada and the US in the two setsof estimates. The US curve stays negative for one additional quarter in comparison with Canada and peaks one quarter later in the OLS version. They note that there are delays but 'both Canada and the US eventually should improve their net external positions with respect to exchange depreciation. With these positive results we find basis for the use of OLS with the Turkish data.

Shirvani and Wilbratte (1997) apply the multivariate cointegration approach proposed by Johansen and Juselius (1990) to test for the bilateral J-curve phenomenon between the USA as the home country, and Canada, France, Germany, Italy, Japan and the UK as her trading partners. They find that with the exception of Italy, there is a statistically significant association (in the expected direction) between the real exchange rate and the trade balance in all cases. Moreover, the trade balance does not respond to the exchange rate in the very short run (1 to 6 months), though over the longer period (1 to 24 months), it does. This is suggestive of horizontally reversed L-Curve effect. Since the Johansen and Juselius approach provides more than one cointegration relationship, we follow Shirvani and Wilbratte (1997) approach and test the Turkish data for the J-curve presence.

Bahmani-Oskooee and Brooks (1999) point out three main deficiencies of Rose and Yellen (1989) and Marwah and Klein (1996) findings;

The way they define real trade balance as the difference between merchandise exports and imports, measured in current US dollars, deflated by the US GNP deflator that might be sensitive to units of measurement. We agree with this point and define Turkish trade balance in the same manner as Bahmani-Oskooee and Brooks (1999) did.

Their analysis is based on Engle-Granger cointegration technique which is based on Ordinary Least Squares and the Dickey-Fuller (DF) or the augmented Dickey-Fuller

(ADF) tests. The DF test may reject cointegration due to its low power. Though we perform OLS and ADF tests we perform other tests in view of their suggestions such as ARDL and VAR modelling.

Since no evidence of cointegration is found, they attempt a simple autoregressive analysis, rather than error-correction modelling.

Moreover, they do not use any objective criterion for selecting the lag structure. Bahmani-Oskooee and Brooks (1999) also object to the use of non-stationary data by Marwah and Klein (1996). We aim to use stationary data in most of our analyses.

They adopt Rose and Yellen (1989) model but redefine the trade balance to be the ratio of US imports from trading partners i over her exports to i. Such a measure is not only unit free but also reflects movements of the trade balance both in real and nominal terms. We define the Turkish trade balance in the same manner. They also adopt the Autoregressive Distributed Lag (ARDL) approach new cointegration technique advanced by Pesaran and Shin (1995), and Pesaran et al. (2001). We find this approach more efficient and less time consuming hence we adopt it for our analyses.

Using US bilateral trade data from 1973Q1 to 1996Q2, they conclude that 'while there was no specific short-run pattern supporting the J-Curve phenomenon, the long-run results supported the economic theory, indicating that a real depreciation of the dollar has a favorable long-run effect on US trade balance with her six trading partners.

Similar results were also obtained by Bahmani-Oskooee and Ratha (2004a) when they expanded the list of US trading partners and included almost all industrial countries.

Bahmani-Oskooee and Goswami (2003) apply ARDL techniques to investigate the J-Curve between Japan and her trading partners (i.e., Australia, Canada, France, Germany, Italy, Netherlands, Switzerland, the UK and the USA). They find evidence of the J-Curve only in the cases of Germany and Italy. In the remaining cases there was no specific short-run pattern. They also argue that cointegration does not imply stability. They, therefore, apply CUSUM and CUSUMSQ tests to the residuals of error-correction model and test for stability of short-run as well as long-run coefficient estimates. We follow their work and apply CUSUM and CUSUMSQ test for the case of Turkey and test the stability of short-run as well as long-run coefficients.

As mentioned in charter one, almost all studies are concentrated on testing the J-curve hypothesis for industrial countries.

Bahmani-Oskooee and Kanitpong (2001), however, investigate the bilateral J-curve between Thailand as a developing country and five of her largest trading partners the USA, Japan, Singapore, UK Germany using the ARDL approach.

They find evidence of the J-Curve between Thailand and the USA and Thailand and Japan. The long run effect of real depreciation was also favourable only in these two cases. Similar results are also obtained for India when Arora et al. (2003) employ the ARDL approach and investigate the J-Curve between India and her major trading partners (i.e., Australia, France, Germany, Italy, Japan, the UK and the USA). Basing on this research we have grounds to carry out the hypothesis with Turkey since it's also a developing country.

Wilson (2001) performs the bilateral J-Curve for Singapore, Malaysia and Korea where he chooses USA and Japan as trading partners for each country. He finds no evidence of cointegration and this could be attributed to the limited nature of his study. However he investigates the J-Curve using a standard VAR specification. He finds evidence of a J-Curve for only Korea. For Singapore and Malaysia his findings suggest that the real exchange rate does not have a significant impact on the real trade balance.

Baharumshah (2001) achieves the same results when he examines the J-Curve for Malaysia and Thailand, again by selecting Japan and the USA as their trading partners. The main deficiency of Bahrumshah's work is that he uses real effective exchange rate rather than the bilateral real exchange rate. Since the trade balance model is a bilateral model, the correct exchange rate to be used should be the real bilateral exchange rate. We therefore discount his study.

Indeed, when the bilateral real exchange rate is used by Bahmani-Oskooee and Kanitpong (2001), they find evidence of the J-Curve between Thailand and the USA in one relation and between Thailand and Japan in another relation. On this account we use bilateral real exchange rates between Turkey and each of her trading partners in our methodology.

As regards to Turkish bilateral J-curve there are few or none in this field thus we sought to research more about this field.

2.4 Aggregate Trade Vs Bilateral Trade Data

As mentioned above the J-curve hypothesis literature is divided into two broad categories these are, those employing aggregate trade and those employing bilateral trade data.

Researchers have used different models with different definitions and measurements of the conceptual variables.

Bahamni-Oskooee and Ratha (2004), assert that whichever type of model and data employed by researchers, the general consensus reached is that the short-run response of the trade balance to currency depreciation does not follow any specific pattern. The results are country specific.

They further assert that as far as the longrun effects of depreciation is concerned, models that rely on bilateral trade data yield more outcomes supporting positive long-run relation between exchange rate and trade balance as compared to aggregate data. On this account we consider bilateral trade data rather than aggregate data for the Turkish bilateral J-curve since we are more concerned with long-run to short-run relationship.

3.0 METHODOLOGY

In this chapter we derive the trade balance model as per the traditional concepts which were developed by different economist. We utilise Unit Roots, Cointegration techniques, VAR modelling and impulse response analyses to test the Turkish J-Curve hypothesis.

3.1 Formulation of the model

We adopt a model that was originally formulated by Rose and Yellen (1989) with the same set of variables. The form models real trade balance (TB) directly as a function of real exchange rate (RER), real domestic income (DY) and real foreign income (FY). In their investigation Marwah and Klein (1996), Bahmani Oskooee and Brooks (1999), Lai and Lowinger (2002a) also followed the same functional form of the model that is.

$$TB_t = f\,(RER_t\, DY_t\, FY_t)$$

Following Bahmani-Oskooee and Brooks(1999) we define trade balance as a ratio of exports to imports to express the model in a logarithm form, to make it unit free and also to reflect movements of the trade balance in both real and nominal terms

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$$\ln TB_{jt} = \beta_0 + \beta_1 \ln DY_t + \beta_2 \ln FY_{jt} + \beta_3 \ln RER_{jt} + \varepsilon_t \qquad (2)$$

Where at a time t, TB_j is the measure of trade balance defined as the ratio of Turkey's import to country j over her export from country j. DY is the measure of Turkey's real income set in index form to make it unit free. FY_j is the index of real income in trading partner j. RER_j is the real bilateral exchange rate between Turkey and trading partner j defined in a way that an increase reflects a real depreciation of the Turkish lira against the currency of the trading partner j. ε_t is the random error term. Equation 2 measures trade balance in real or nominal terms.

Expected Signs of Coefficients

Following traditional arguments from various researchers, if an increase in Turkish real income (DY_t) raises imports the estimate of β_1 would be expected to be negative. However, if increase in the DY_t is due to an increase in the production of import-substituted goods then the estimate of β1 would be expected to be positive.

Likewise the estimated value of β_2 could be either negative or positive depending on whether the demand side factors dominate supply side factors or vice versa.

As per the J-curve hypothesis if a real depreciation, i.e., an increase in RER_{jt} is to increase exports and lower imports, then we expect the estimate β_3 to be positive this also satisfies the ML condition. However in the short-run we expect β_3 to be negative.

3.2 Cointegration Tests

In an attempt to solve the problem of spurious regression Bahmani-Oskooee (1991) and Bahmani-Oskooee and Alse (1994) applied cointegration analysis to trade data of many developing countries. In view of the above, since Turkey is a developing country we utilise single cointegration techniques to investigate the long-run relationship between TB, DY, FY and RER. We use ECM and ARDL Bound cointegration method.

3.2.1 Error Correction Model (ECM)

In order to test the J-curve phenomenon we need to incorporate the short-run dynamics into equation 2. Engle Granger (1987) asserts that this could be done if we formulate equation 1 by specifying it in an error correction modelling format.

From equation 2

$$\Delta \ln TB_{j,t} = \alpha_0 + \sum_{i=1}^{m} \omega_i \Delta \ln TB_{j,t-i} + \sum_{i=0}^{m} \beta_i \Delta \ln DY_{t-i} + \sum_{i=0}^{m} \gamma_i \Delta FY_{j,t-i}$$
$$+ \sum_{i=0}^{m} \lambda_i \Delta \ln RER_{j,t-i} + \delta \varepsilon_{t-1} + \omega_t \qquad (3)$$

Where, ε_{t-1} are stationary residuals from equation 1 and δ is the speed of adjustment. However, since we might have a model in which some variables are non-stationary and some are stationary. This limits the condition of the variables to be cointegrated that requires them all to be non-stationary we adopt a better cointegration methodology that is the Pesaran *et al.* (2001).

3.2.2 Pesaran et al (2001) ARDL bounds cointegration method

We apply the bounds testing procedure developed by Pesaran and Shin (1995) and Pesaran *et al* (2001) to investigate the existence of the long-run relationship as predicted by the theory between the variables under consideration. Without having any prior information about the direction of the long-run relationship among the variables the Autoregressive Distributed Lagged (ARDL) model takes the following form:

$$\begin{aligned}\Delta \ln TB_{jt} &= \alpha_0 + \sum_{i=1}^{n} \omega_i \Delta \ln TB_{j,t-i} + \sum_{i=0}^{n} \beta_i \Delta \ln DY_{t-i} + \sum_{i=0}^{n} \gamma_i \Delta \ln FY_{j,t-i} \\ &+ \sum_{i=0}^{n} \lambda_i \Delta \ln RER_{j,t-i} + \delta_1 \ln TB_{j,t-1} + \delta_2 \ln DY_{t-1} + \delta_3 \ln FY_{j,t-i} \\ &+ \delta_4 \ln RER_{j,t-1} + \mu_t \end{aligned} \quad (4)$$

Three other models are estimated taking each of the remaining variables in turn as the dependent variable.

We consider Pesaran *et al* (2001) over other cointegration methodologies such as Engle-Granger (1987) and Phillips and Hansen (1990) because; This method doesn't necessitate the establishment of the order of integration amongst the variables like other cointegration methodologies thus it eliminates the pre-testing for unit roots from our econometric methodology. Pesaran *et al* methodology is also reliable for our small size data thus we expect our estimates to be highly consistent.

Pesaran *et al* and Shin (1995) introduced a two step procedure to estimate equation 4.

In the first step the null hypothesis for no cointegration (non-existence of the long-run relationship among $TB_{jt,}$ DY, FY_{jt} and RER_{jt}) that is defined by H_0: $\delta_1 = \delta_2 = \delta_3 = \delta_4$.is tested against the alternative of H_1: $\delta_1 \neq \delta_2 \neq \delta_3 \neq \delta_4$ (long-run relationship present).

Decision rule

The Pesaran *et al* (2001) provides two sets of asymptotic critical values; One set assumes that all the variables included in the model are I(1) while the other assumes that they are all I (0). If the computed F-statistic falls above the upper bound then we reject the null hypothesis. If the computed F-statistics fall below the lower bound then we don't reject the null hypothesis. If the computed F-statistic falls inside the critical band then the results will be inconclusive. In this case following Kremers *et al* (1992) we adopt the error correction term to establish cointegration. Once we have confirmed the existence of cointegration in the second step, a further two step procedure is carried out to estimate the model. First the order of the lags in the ARDL model are selected using the appropriate selection criteria such as Akaike Information Criterion (AIC) and Schwartz Bayesian Criterion (SBC) and in the second we estimate the short-run and long-run coefficients of the trade balance function along with the associated ARDL error correction model.

3.3 Unit root tests

We utilize the method that was suggested by Dickey and Fuller (1981) the modified Augmented Dickey Fuller (ADF) test that is, the DF-GLS test that utilises generalised least squares for Unit-root testing. We form the general form of the ADF regression equation to test stationarity of a time series like y as follows:

$$\Delta Y_t = \mathrm{B}_1 + \mathrm{B}_2 t + \mathrm{B}_3 Y_{t-1} + \sum_{i=1}^{p} \alpha_i \Delta Y_{t-i} + \varepsilon_t \qquad (5)$$

Where ΔY_t is the first differenced series of $\Delta Y_{t,}$ t is the time trend and ε_t is the white noise residual. In order to avoid autocorrelation problem in equation 5 a number of differenced series of Y are added however the lag length (p) is selected to be large enough. We select the lag length basing on both AIC and SBC criterion.

These results are relevant for the Johansen cointegration analysis that requires the variables to be integrated by the same order

3.4 Johansen Juselius model

We follow Shirvani and Wilbratte (1997) who apply the proposed Johansen Juselius (1992) in their investigation for J-curve phenomenon for the US and six of her trading partners. In his investigation Johansen Juselius (1990) shows that a multivariate model yields substantially lower residual variance compared to a univariate model. In view of this since EGTS approach to cointegration confirms only one cointegration relationship among a set of economic variables, we apply the Johansen (1990) maximum likelihood that provides more than one cointegration relationship.

We utilize the Johansen procedure to analyses the relationship among stationary or non stationary variables since its estimates are less likely to be biased and can also be used to determine the number of cointegration relationships.

We recall equation (2)

$$\ln TB_{jt} = \beta_0 + \beta_1 \ln DY_t + \beta_2 \ln FY_{jt} + \beta_3 \ln REER_{jt} + \varepsilon_t$$

The vector error correction model (VECM) corresponding to these variables is;

$$\Delta Y_t = \mu_t + \sum_{i=1}^{k-1} \Phi_i \Delta Y_{t-i} + \Pi Y_{t-k} + v_t \quad (6)$$

$$\Pi = \alpha\beta \quad (7)$$

Where Y_t is a px1 vector of stochastic variables (TB_t, DY_t, FY_t and RER_t), that are presumed to be I (1) hence the significance of unit root testing. μ_t is the intercept term and v_t is the error term which is assumed to be a white noise.

Since Y_t is expected to be I (1), if a linear combination of these I (1) variables exists that is stationary then these variables are said to be cointegrated. If cointegration exists then Engle and Granger (1987) demonstrated that an error correction representation like equation 5 exists for these variables. Φ and Π represent coefficient matrices, in which Π is the impact matrix α is the vector speed of adjustment and β is the cointegrating vector and both are p x r matrices.

Determination of the number of cointegrating vectors

We determine the number of cointegration vectors in the system which is based on the values of λ_{max} and $\lambda_{trace.}$ Both of these tests are standard likelihood ratio tests with non-standard distribution. We test for the null hypothesis that there are r cointegrating vectors against the alternative that r + 1 exists for the maximum eigenvalue statistic test. The trace statistics on the hand we test the null hypothesis of r = k (k=1,2,…., n-1) against the alternative of unrestricted r.

Decision rule

If the calculated statistics are greater than the corresponding critical values at specific level of significance, the null hypothesis which is presented in the first column of the Microfit results should be rejected.

If the rank is equal to zero it indicates that the TB_j, DY, FY_j and $REER_j$ are not cointegrated.

If the Johansen-Juselius multivariate cointegration indicates that a cointegrating vector exists between the variables then it implies that the linear combination of variables is stationary hence J-curve phenomenon holds in the long run.

Estimation of the of Johansen model

If the three variables are cointegrated then we can use their level forms in estimation. The expected signs for the coefficients are positive DY, negative or positive FY and negative RER for J-Curve hypothesis to hold.

3.5 Impulse Response Analysis

According to Lal and Lowinger (2002a) the best way of deriving evidence of the J-curve is by using the impulse response functions. The generalised impulse response function reveal insights into the dynamic relationships in existence as they portray the response of a variable to an unexpected shock in another variable over a given time horizon. Impulse response functions measure the impact of external shocks on the variables in the system via error terms in the system. This entails plotting the impulse response function through time. A vector autoregression can be written as a vector moving average.

In the moving average representation coefficients of the error terms are called the impact multipliers and can be used in measuring the interaction between variables of the model. Hence as suggested by Koop et al (1996) impulse response would include feedbacks. As mentioned in chapter 2 section 2, the classical impulse analysis uses orthogonalized impulse responses where underlying shocks to the VAR system are orthogonalized using the Cholesky decomposition. The drawback to this approach is that impulse responses are not unique and are not invariant to the ordering of variables in the VAR. This can be solved by imposing priori restrictions so that covariance matrix is diagonal.

Koop et al (1996) and Pesaran and Shin (1996) suggest generalized impulse response analysis as an alternative method in which impulse responses would be unique and invariant to the ordering of variables. As many other developing countries, Turkey has been experiencing structural imp-balances resulting from a continuous process of development and structural change. We construct generalized impulse response as an average of the present and past to derive evidence of Turkeys J-curve with her trading partners and to identify specific points within the sample period where a structural break down in the model might have occurred.

3.6 CUSUM and CUSUMSQ tests

The existence of cointegration in the above methodologies doesn't necessary imply that the estimated coefficients are stable. Hence we follow Bahmani-Oskooee and Bohl (2000) and Bahmani-Oskooee and Goswami (2003) investigate the stability of the long-run relation of the trade balance between RER, DY and FY using tests suggested by Brown *et al* (1975).

The CUSUM test plots the recursive residuals against the break points and the CUSUMQ test plots the squared recursive residuals against the break points. Brown *et al* (1975) asserts that for stability both plots must stay within the five percent significance level displayed by the straight lines. We inspect the CUSUM and CUSUMSQ plots to establish the long-run stability of Turkey's trade balance with her trading partners.

4.0 EMPIRICAL RESULTS

In this chapter we carry out the several empirical analyses as listed in the methodology using annul data of Austria, Belgium, England, France, Germany, Holland, Italy, Switzerland, Turkey U.S.A and World.

The variables are; the trade balance (TB_j) which is defined as the ratio of Turkey's export to country j over her imports from country j, Turkey's real income (DY) set in index form, FY_j as the index of real income in trading partner j and RER_j as the real bilateral exchange rate between Turkey and trading partner j.[1]

We utilize Microfit software to perform the all the empirical analyses.

4.1 Cointegration Results

In this section we estimate Equation 4 into two stages. In the first stage we apply the F-test to equation 4 to determine whether the lagged levels of variables are cointegrated and should be retained. Bahmani-Oskooee and Brooks (1999) and Bahamni-Oskooee and Goswami (2003) show that the F-test results depend on the number of lags imposed on each of the first differenced variable. Hence we apply the unrestricted VAR method where we select the optimal lag level using the Akaike Information Criterion (AIC) and Schwarz Bayesian Criterion (SBC). Results indicate zero as the optimal lag level for all the cases apart from World case that indicates one. For brevity, the results for this step are not reported. In view of Bahmani-Oskooee and Brooks (1999) suggestions about sensitivity of the order of VAR, we further estimate equation 4 three more times in the same way but the dependent variable is replaced by one of the explanatory variables in search of other possible long-run relationships. We report the results of the F-test in table (2).

From table (2) given the 5% significance level critical value of (4.351) we obtain evidence for cointegration for only USA when we estimate equation 4 with TB_j as the dependent variable. When we estimate equation 4, with DY as the dependent variable, we obtain evidence for cointegration for Austria, France and Holland.

[1] We provide detailed Data definitions and sources in Appendix A

We only obtain support for cointegration for Switzerland when we estimate equation 4 with FY_j as the dependent variable. However we find strong evidence for cointegration for all the 9 cases apart from Aggregate case when we estimate equation 4 with RER_j as the dependent variable.

Table 2 F-statistics for cointegration relationships.

Critical Value bounds of the F-statistic				
90% level			95% level	
I(0)	I(1)		I(0)	I(1)
2.721	3.773		3.232	4.351
Trading partner	F_{TB}	F_{DY}	F_{FY}	F_{RER}
Austria	3.2278	5.0075	0.9901	20.2906
Belgium	4.2914	3.9533	3.7835	16.3430
England	2.4034	2.0784	1.9264	18.2699
France	2.8472	5.5438	1.5371	17.4334
Germany	2.3809	4.1606	2.7510	21.0033
Holland	2.6674	5.0046	3.8747	15.1241
Italy	1.8106	2.6955	2.8999	16.1753
Switzerland	3.5108	2.2017	6.2304	23.0937
USA	9.4973	3.7945	1.7591	34.7160
Aggregate	1.7916	2.8492	3.2558	1.4232

Notes: $F_{TB} = (\ln TB_j \mid \ln DY, \ln FY_j, \ln RER_j)$, $F_{DY} = (\ln DY \mid \ln TB_j, \ln FY_j, \ln RER_j)$, $F_{FY} = (\ln FY_j \mid \ln TB_j, \ln DY, \ln RER_j)$ and $F_{REER} = (\ln RER_j \mid \ln TB_j, \ln DY, \ln FY_j)$. The critical values are obtained from Table C1.III (with unrestricted intercept and no trend with three regressors) in the Pesaran et al. (2001)

According to Bahmani-Oskooee and Brooks (1999), we consider results from step one as preliminary as there is an alternative and relatively more efficient method of establishing cointegration that is ECM_{t-1}. A negative and significant coefficient obtained for ECM_{t-1} will be an indication for cointegration. In the second step we estimate equation 3 and 4 basing on AIC criterion to determine the optimal lag length.

Since we are using annual data we set the maximum number of lags equal to 2 .From table 3, the error correction terms ECM_{t-1} that measure the speed of adjustment to restore equilibrium in the dynamic model, all carry the expected negative sign and are statistically significant at the 5% level coefficients in all cases expect for Belgium and USA. This further supports cointegration results obtained by using F-statistic in the first step that the long-run equilibrium is attainable.

Table 3, Turkish trade balance in the short-run Estimates from the Error Correction Model based on AIC.

Regressors	Austria	Belgium	England	France	Germany
Constant	2.449	-12.176	4.446	-3.404	2.333
	(0.464)	(2.473)	(1.805)	(0.626)	(0.846)
Δ $lnRER_t$	0.008	-0.045	0.013	-0.022	0.008
	(0.478)	(1.723)	(1.063)	(0.705)	(0.492)
Δ $lnFY_t$	-0.238	-2.348	-1.684	-3.295	-1.851
	(0.311)	(1.608)	(1.210)	(1.919)	(2.320)
Δ $lnDY_t$	-0.108	0.513	2.046	0.570	1.456
	(0.146)	(0.570)	(2.177)	(0.661)	(1.990)
ECM_{t-1}	-0.509	-1.000	-0.385	-0.507	-0.213
	(3.409)		(2.951)	(3.463)	(1.803)
R^2	0.263	0.552	0.553	0.370	0.434
R^{2-}	0.176	0.499	0.434	0.275	0.328
RSS	2.676	3.107	1.148	3.642	0.865
DW	1.804	1.605	2.365	1.634	2.206

Notes: figures in parentheses are the absolute values of t-ratios.

Table 3. Turkish trade balance in the short-run Estimates from the Error Correction Model based on AIC.

Regressors	Holland	Italy	Switzerland	USA	Aggregate
Constant	-0.010	0.558	-6.833	-5.543	0.0281
	(0.002)	(0.095)	(1.550)	(1.816)	(0.027)
Δ lnRER_t	-0.013	0.003	-0.016	0.318	-0.522
	(0.485)	(0.112)	(0.730)	(1.841)	(3.397)
Δ lnFY_t	0.046	-4.322	1.151	-2.172	-2.262
	(0.034)	(2.960)	(1.296)	(2.745)	(2.614)
Δ lnDY_t	-0.762	3.055	0.187	2.036	1.591
	(0.826)	(2.441)	(0.303)	(1.735)	(2.330)
ECM_{t-1}	-0.573	-0.163	-0.486	-1.000	-0.517
	(3.778)	(1.170)	(3.465)		(3.841)
R^2	0.438	0.506	0.289	0.627	0.563
R^{2-}	0.332	0.395	0.205	0.557	0.464
RSS	2.043	2.483	3.849	1.816	0.684
DW	2.142	1.674	1.934	2.315	2.096

Notes: figures in parentheses are the absolute values of t-ratios.

In order to access the J-curve hypothesis and since our focus is on the dynamics of devaluation, we report in table 4 the coefficients of first differenced real bilateral exchange rates. Negative coefficients for some early lags of the exchange rate followed by positive ones for latter lags will give evidence for the J-curve hypothesis.

The short-run results reported in table 4 clearly show that there is no specific pattern in the response of the bilateral trade balance to change in real bilateral exchange rate. Hence there is no J-curve pattern in any of the cases. However if we follow Rose and Yellen (1989) and define the J-curve as a negative short-run effect combined with a positive long-run effect then we need to report estimates of δ_1- δ_4. To infer the long-run impact of real depreciation we report these results in table 5 after normalising the estimates of δ_2- δ_4 on $\delta_{1.}$

Table 4 Coefficient Estimates of $\Delta REER_{t-i}$ and Error Correction Terms based on AIC.

Regressors	Austria	Belgium	England	France	Germany
ΔRER_t	-0.044	0.133	-0.331	-0.024	-0.226
	(0.262)	(0.572)	(2.582)	(0.129)	(2.003)
ΔRER_{t-1}	-0.257	0.825	-0.006	0.077	0.078
	(1.319)	(0.308)	(0.037)	(0.368)	(0.587)
ΔRER_{t-2}	0.057	0.319	0.231	-0.017	0.156
	(0.276)	(1.177)	(1.555)	(0.077)	(1.175)
ΔRER_{t-3}	-0.113	-0.082	-0.025	-0.262	-0.072
	(0.552)	(0.294)	(0.160)	(1.217)	(0.540)
ΔRER_{t-4}	-0.090	-0.030	-0.283	0.002	-0.182
	(0.461)	(0.114)	(2.000)	(0.010)	(1.394)
EC_{t-1}	-0.552	-0.535	-0.445	-0.364	-0.302
	(2.918)	(3.178)	(2.689)	(2.668)	(2.416)
Diagnostics tests					
R^2	0.331	0.307	0.438	0.258	0.329
R^{2-}	0.133	0.133	0.271	0.073	0.161
RSS	2.104	4.488	0.271	2.873	0.977
DW	1.979	2.377	2.059	2.184	2.146

Note: figures in parentheses are the absolute values of t-ratios.

Table 4 Coefficient Estimates of $\Delta REER_{t-i}$ and Error Correction Terms based on AIC.

Regressors	Holland	Italy	Switzerland	USA	Aggregate
$\Delta REER_t$	0.153	-0.284	0.088	0.316	-0.346
	(0.868)	(1.601)	(0.426)	(1.733)	(1.484)
$\Delta REER_{t-1}$	-0.031	-0.004	0.283	0.164	-0.234
	(0.154)	(0.019)	(1.229)	(0.810)	(0.894)
$\Delta REER_{t-2}$	0.181	0.083	-0.234	0.175	-0.029
	(0.870)	(0.392)	(0.972)	(0.933)	(0.123)
$\Delta REER_{t-3}$	-0.249	-0.369	-0.263	-0.079	-0.246
	(1.177)	(1.759)	(1.119)	(0.421)	(1.036)
$\Delta REER_{t-4}$	0.035	-.0370	-0.161	0.234	0.141
	(0.172)	(0.166)	(0.685)	(1.254)	0.580
EC_{t-1}	-0.334	-0.509	-0.484	-1.146	-0.311
	(2.643)	(3.218)	(3.326)	(4.140)	(1.975)
Diagnostics					
R^2	0.295	0.385	0.377	0.515	0.353
R^{2-}	0.119	0.231	0.222	0.371	0.162
RSS	2.509	2.727	3.313	1.969	0.909
DW	2.382	2.156	1.949	2.088	2.207

Note: figures in parentheses are the absolute values of t-ratios.

From table 5, it is gathered that the bilateral real exchange rates carries a positive and highly significant coefficient only in results for England though its magnitude is very low. Although Austria, Germany and Italy coefficients carry the expected positive sign, there results are not statistically significant. Thus even with this criterion there is no strong evidence in support of the J-curve. Hence the significant coefficients estimates in table 4 and the lack of significant estimates for bilateral real exchange rate in table 5 suggest that while real depreciation of the Turkish lira has some short-run effects but it doesn't last in the long-run.

Table 5 Estimated Long-Run Coefficients of the Turkish Bilateral Trade Balance Model, ARDL Approach selected is based on AIC.

Trading Partner	Constant	DY	FY_j	RER_j
Austria	4.815	-0.213	-0.468	0.017
	(0.474)	(0.146)	(0.308)	(0.478)
Belgium	-12.176	0.513	1.571	-0.445
	(2.473)	(0.570)	(1.229)	(1.724)
England	11.562	-2.516	3.862	0.033
	(2.621)	(1.450)	(0.899)	(1.072)
France	-6.719	1.125	-1.104	-1.104
	(0.638)	(0.658)	(0.519)	(0.712)
Germany	10.941	-2.090	2.739	0.039
	(0.669)	(0.694)	(0.681)	(0.422)
Holland	-0.018	-1.330	3.332	-0.023
	(0.002)	(0.840)	(2.188)	(0.487)
Italy	3.429	0.383	-1.629	0.019
	(0.095)	(0.068)	(0.243)	(0.111)
Switzerland	-14.063	0.386	2.369	-0.032
	(1.856)	(0.312)	(1.212)	(0.756)
USA	5.543	1.421	-2.172	-.0344
	(1.817)	(2.626)	(2.746)	(2.395)
Aggregate	0.054	0.937	-0.841	-1.008
	(.0274)	(1.343)	(0.714)	(3.837)

Note: figures in parentheses are the absolute values of t-ratios.

4.2 Unit Root tests.

Initially we test time series properties of the model variables (TB_j, RER_j, DY, and FY_j) by using the suggested Dickey and Fuller (1981) modified Augmented Dickey Fuller (ADF) unit root tests. We examine presence of Unit roots by selecting ADF results for TB_j, RER_j, DY, and FY_j with an intercept and a linear trend.

Table 6 a) Unit root test results for Trade balance.

Variable	ADF (Test Statistic)	Lag Length
lnTBAustria	-2.6096	1
lnTBelgium	-2.4019	1
lnTBEngland	-2.9759	1
lnTBFrance	-2.8468	5
lnTBGermany	-2.5578	1
lnTBHolland	-2.3350	1
lnTBItaly	-2.6349	5
lnTBSwitzerland	-2.6492	1
lnTBUSA	-2.8312	1
lnTBAgge	-2.2217	5

b) Unit root results for Δ TB_j

Variable	ADF (Test Statistic)	Lag Length
lnΔTBAustria	-3.6058	2
lnΔTBelgium	-3.6007	5
lnΔTBEngland	-5.2995	1
lnΔTBFrance	-5.6580	1
lnΔTBGermany	-4.4152	1
lnΔTBHolland	-5.6776	1
lnΔTBItaly	-4.1406	2
lnΔTBSwitzerland	-3.6482	2
lnΔTBUSA	-4.2884	2
lnΔTBAggregate	-5.4447	1

Notes: The 95% critical value for the ADF statistic is -3.5426. The order of the lag length is selected using the Akaike Information Criterion (AIC).

c) Unit root results for FY_j

Variable	ADF (Test Statistic)	Lag length
lnRYAustria	-2.4930	1
lnRYBelgium	-2.5103	1
lnRYEngland	-3.9211	1
lnRYFrance	-2.7039	1
lnRYGermany	-2.7942	1
lnRYHolland	-2.4423	2
lnRYItaly	-4.4414	5
lnRYSwitzerland	-2.7332	3
lnRYUSA	-2.8884	1
lnRYTurkey	-3.2062	5
lnRYAggregate	-2.9174	1

d) Unit root results for Δ FY_j

Variable	ADF (Test Statistic)	Lag length
lnΔRYAustria	-3.6032	1
lnΔRYBelgium	-3.9806	1
lnΔRYFrance	-4.7404	0
lnΔRYGermany	-4.7148	1
lnΔRYHolland	-4.5809	0
lnΔRYSwitzerland	-4.1062	1
lnΔRYTurkey	-3.6537	3
lnΔRYUSA	-4.1644	2
lnΔRYAggregate	-5.1322	1

e) Unit root results for RER_j

Variable	ADF (Test statistic)	Lag Length
lnRERAustria	-2.1306	1
lnRERBelgium	-1.8923	1
lnREREngland	-1.5757	1
lnRERFrance	-1.6780	1
lnRERGermany	-2.1462	1
lnRERHolland	-2.1569	1
lnRERItaly	-1.2715	2
lnRERSwitzerland	-2.2505	1
lnRERUSA	-1.7199	3
lnRERAggregate	-2.7449	2

Notes: The 95% critical value for the ADF statistic is -3.5426. The order of the lag length is selected using the Akaike Information Criterion (AIC).

f) Unit root results for ΔRERj

Variable	ADF (Test statistic)	Lag Length
lnΔRERAustria	-3.5922	0
lnΔRERBelgium	-3.7291	0
lnΔRER(England	-3.8647	0
lnΔRERFrance	-3.9454	0
lnΔRERGermany	-3.6598	0
lnΔRERHolland	-3.6337	0
lnΔRERItaly	-4.0365	0
lnΔRERSwitzerland	-3.7767	0
lnΔRERUSA	-4.1008	0
lnΔRERAggregate	-4.1031	1

Notes: The 95% critical value for the ADF statistic is -3.5426. The order of the lag length is selected using the Akaike Information Criterion (AIC).

From table 6, variables have at least one unit root since their absolute test statistics values are less than the absolute critical value for the ADF statistic equal to (3.5426) at a 5% level of significance for ten cases except for the case of England and Italy's foreign incomes. However non stationary variables can be made stationary by taking first differences of the variables. Hence we take first differences for all the variables apart from England and Italy income.

From table 6 all the variables are stationary in their first differences. Since we have established the order of integration of the variables as I (1), we explore existence of any significant long-run relationships among the variables in our model. If TB_j are cointegrated with RER_j, FY_j and DY then this will provide statistical evidence for the existence of a long-run relationship. Engle and Granger (1987) proposed a two-step estimation procedure; first, running an OLS regression and then subjecting the residuals from that regression to unit root tests. However, DF and ADF residual-based cointegration tests are sensitive to the normalization rule, that is, the choice of the dependent variable (Dickey et al., 1991). Moreover, Juselius (1992) showed that a multivariate model yields substantially lower residual variance compared to a univariate model. Thus we apply the multivariate cointegration by Johansen (1995).

4.3 Johansen Procedure

Initially we determine the optimum number of lags. Table 7 reports the optimum lag selection based on AIC, SBC Adjusted LR tests. Results indicate that the optimum lag order is one. Hence we apply VAR order one for the Johansen cointegration

Table 7 Optimum lag selection based on the order of the VAR

Trading partner	AIC	SBC	Adjusted L R test	Decision
Austria	1	1	1	1
Belgium	1	1	1	1
England	2	1	1	1
France	1	1	1	1
Germany	1	1	1	1
Holland	1	1	1	1
Italy	2	1	1	1
Switzerland	2	1	1	1
USA	1	1	1	1
Aggregate	1	1	1	1

We determine the rank of the long-run matrix Π that involves finding the number of linearly independent columns of Π. This consequently gives us the number of cointegrating relationships that exists among the variables

As mentioned in chapter 3 Johansen (1995) developed two test statistics to determine the cointegration rank these are the maximum eigenvalue statistics and the trace statistics. We provide calculation for these statistics for the VAR model. We test for the null hypothesis that there are r cointegrating vectors against the alternative that r + 1 exists for the maximum eigenvalue statistic test. For the trace statistics we test the null hypothesis of r = k (k=1, 2,…, n-1) against the alternative of unrestricted r. We reject the null hypothesis if the calculated statistics are greater than the corresponding critical values at a given specific level of significance. We select the restricted intercept, no trend option.

Table 8 reports rank results basing on the Maximal Eigenvalue and Trace statistic. We reject the null hypothesis for no cointegration relationship (r =0) since both the calculated λ_{max} and λ_{trace} are greater than the critical values at both 5% and 10% for all variables. However in almost all cases we have more than one long-run relationship between the variables which makes the interpretation of individual vectors difficult. Since our priority is the existence of the J-curve rather than the meaning of the meaning of the individual vectors, we estimate all the vectors which are normalized by the trade balance and we only select one vector.

Table 8 a) Austria; Rank Determination based on Maximal Eigenvalue for Π (VAR=1)

Null	Alternative	Statistic	95% Critical Value	90% Critical Value
r = 0	r = 1	115.486	28.270	25.800
r<= 1	r = 2	25.162	22.040	19.860
r<= 2	r = 3	12.764	15.870	13.810
r<= 3	r = 4	5.045	9.160	7.530

Austria; Rank Determination based on Trace for Π

Null	Alternative	Statistic	95% Critical Value	90% Critical Value
r = 0	r>= 1	158.458	53.480	49.950
r<= 1	r>= 2	42.972	34.870	31.930
r<= 2	r>= 3	17.809	20.180	17.880
r<= 3	r = 4	5.045	9.160	7.530

b) Belgium; Rank Determination based on Maximal Eigenvalue for Π (VAR=1)

Null	Alternative	Statistic	95% Critical Value	90% Critical Value
r = 0	r = 1	107.627	28.270	25.8000
r<= 1	r = 2	32.766	22.040	19.860
r<= 2	r = 3	24.617	15.870	13.810
r<= 3	r = 4	11.472	9.160	7.530

Belgium; Rank Determination based on Trace for Π

Null	Alternative	Statistic	95% Critical Value	90% Critical Value
r = 0	r>= 1	176.484	53.480	49.950
r<= 1	r>= 2	68.856	34.870	31.930
r<= 2	r>= 3	36.090	20.180	17.880
r<= 3	r = 4	11.472	9.160	7.530

c) England; Rank Determination based on Maximal Eigenvalue for Π (VAR=1)

Null	Alternative	Statistic	95% Critical Value	90% Critical Value
r = 0	r = 1	99.688	28.270	25.800
r<= 1	r = 2	23.995	22.040	19.860
r<= 2	r = 3	12.711	15.870	13.810
r<= 3	r = 4	9.122	9.160	7.530

England; Rank Determination based on Trace for Π

Null	Alternative	Statistic	95% Critical Value	90% Critical Value
r = 0	r>= 1	145.518	53.480	49.950
r<= 1	r>= 2	45.830	34.870	31.930
r<= 2	r>= 3	21.834	20.180	17.880
r<= 3	r = 4	9.122	9.160	7.530

d) France; Rank Determination based on Maximal Eigenvalue for Π (VAR=1)

Null	Alternative	Statistic	95% Critical Value	90% Critical Value
r = 0	r = 1	108.231	28.270	25.800
r<= 1	r = 2	30.035	22.040	19.860
r<= 2	r = 3	14.862	15.870	13.810
r<= 3	r = 4	5.869	9.160	7.530

France; Rank Determination based on Trace for Π

Null	Alternative	Statistic	95% Critical Value	90% Critical Value
r = 0	r>= 1	158.999	53.480	49.950
r<= 1	r>= 2	50.767	34.870	31.930
r<= 2	r>= 3	20.731	20.180	17.880
r<= 3	r = 4	5.869	9.160	7.530

e) Germany; Rank Determination based on Maximal Eigenvalue for Π (VAR=1)

Null	Alternative	Statistic	95% Critical Value	90% Critical Value
r = 0	r = 1	115.463	28.270	25.800
r<= 1	r = 2	27.635	22.040	19.860
r<= 2	r = 3	14.724	15.870	13.810
r<= 3	r = 4	4.427	9.160	7.530

Germany; Rank Determination based on Trace for Π

Null	Alternative	Statistic	95% Critical Value	90% Critical Value
r = 0	r>= 1	162.250	53.480	49.950
r<= 1	r>= 2	46.787	34.870	31.930
r<= 2	r>= 3	19.151	20.180	17.880
r<= 3	r = 4	4.427	9.160	7.530

f) Holland; Rank Determination based on Maximal Eigenvalue for Π (VAR=1)

Null	Alternative	Statistic	95% Critical Value	90% Critical Value
r = 0	r = 1	108.598	28.270	25.800
r<= 1	r = 2	36.214	22.040	19.860
r<= 2	r = 3	19.086	15.870	13.810
r<= 3	r = 4	10.589	9.160	7.530

Holland Rank Determination based on Trace for Π Holland

Null	Alternative	Statistic	95% Critical Value	90% Critical Value
r = 0	r>= 1	174.488	53.480	49.950
r<= 1	r>= 2	65.890	34.870	31.930
r<= 2	r>= 3	29.676	20.180	17.880
r<= 3	r = 4	10.589	9.160	7.530

g) Italy; Rank Determination based on Maximal Eigenvalue for Π (VAR=1)

Null	Alternative	Statistic	95% Critical Value	90% Critical Value
r = 0	r = 1	94.399	28.270	25.800
r<= 1	r = 2	37.374	22.040	19.860
r<= 2	r = 3	14.278	15.870	13.810
r<= 3	r = 4	7.341	9.160	7.530

Italy; Rank Determination based on Trace for Π

Null	Alternative	Statistic	95% Critical Value	90% Critical Value
r = 0	r>= 1	153.393	53.480	49.950
r<= 1	r>= 2	58.994	34.870	31.930
r<= 2	r>= 3	21.619	20.180	17.880
r<= 3	r = 4	7.341	9.160	7.530

h) Switzerland Rank Determination based on Maximal Eigenvalue for Π (VAR=1)

Null	Alternative	Statistic	95% Critical Value	90% Critical Value
r = 0	r = 1	108.852	28.270	25.800
r<= 1	r = 2	37.73	22.040	19.860
r<= 2	r = 3	13.173	15.870	13.810
r<= 3	r = 4	7.874	9.160	7.530

Switzerland Rank Determination based on Trace for Π Switzerland

Null	Alternative	Statistic	95% Critical Value	90% Critical Value
r = 0	r>= 1	167.633	53.480	49.950
r<= 1	r>= 2	58.780	34.870	31.930
r<= 2	r>= 3	21.047	20.180	17.880
r<= 3	r = 4	7.874	9.160	7.530

i) USA Rank Determination based on Maximal Eigenvalue for Π (VAR=1)

Null	Alternative	Statistic		95% Critical Value	90% Critical Value
r = 0	r = 1	120.188		28.270	25.800
r<= 1	r = 2	35.804		22.040	19.860
r<= 2	r = 3	15.061	1	15.870	13.810
r<= 3	r = 4	5.130		9.160	7.530

USA Rank Determination based on Trace for Π

Null	Alternative	Statistic	95% Critical Value	90% Critical Value
r = 0	r>= 1	176.185	53.480	49.950
r<= 1	r>= 2	55.997	34.870	31.930
r<= 2	r>= 3	20.192	20.180	17.880
r<= 3	r = 4	5.130	9.160	7.530

j) Aggregate Rank Determination based on Maximal Eigenvalue for Π (VAR=1)

Null	Alternative	Statistic	95% Critical Value	90% Critical Value
r = 0	r = 1	54.301	28.270	25.800
r<= 1	r = 2	21.223	22.040	19.860
r<= 2	r = 3	9.955	15.870	13.810
r<= 3	r = 4	5.505	9.160	7.530

Aggregate Rank Determination based on Trace for Π

Null	Alternative	Statistic	95% Critical Value	90% Critical Value
r = 0	r>= 1	90.986	53.480	49.950
r<= 1	r>= 2	36.684	34.870	31.930
r<= 2	r>= 3	15.460	20.180	17.880
r<= 3	r = 4	5.505	9.160	7.530

Estimation of the of Johansen model

Table 9 reports the estimates of cointegrated vectors normalised by the trade balance. We select the appropriate cointergrating vector basing on the expected sign of the real exchange rate as our primary selection criteria. From table 9 we have evidence for the J-curve hypothesis for only the case of Aggregate data as the coefficient of real exchange rate is greater than one. Though we have positive long-run real exchange rate elasticites for Germany, Holland, Italy and the USA, their magnitude is very low.

Table 9 Estimated Cointegrated Vectors Normalised by the Trade Balance coefficient.

Country	lnTB	lnDY	$lnFY_j$	$lnRER_j$	Intercept
Austria	1.000	1.886	-1.596	-0.0230	-14.436
Belgium	1.000	1.343	-3.382	-0.0004	-0.315
England	1.000	-1.615	3.932	-0.0357	-2.596
France	1.000	2.310	-3.915	-0.0502	-8.690
Germany	1.000	-1.626	-3.404	0.0828	32.761
Holland	1.000	-8.157	6.450	0.2731	61.786
Italy	1.000	-7.996	4.998	0.0607	60.838
Switzerland	1.000	-1.498	-1.120	-0.0568	20.836
USA	1.000	-1.236	2.140	0.0154	3.439
Aggregate	1.000	-1.163	1.298	1.0544	0.094

4.4 Impulse Response Analysis Results

However as mentioned in chapter three, Lal and Lowinger (2002a) assert that the best way of deriving evidence of the J-curve is by using the impulse response functions. Hence we derive the generalised impulse response functions from the VECM of the selected cointegrating vectors. The response of the trade balance to permanent one standard-error depreciation in the exchange rate is traced in the selected vectors. For the existence of the J-curve hypothesis in the case for devaluation, we expect the trade balance to first deteriorate then followed by an improvement. We provide graphical representations of the generalised response functions

Figure 1. Austria

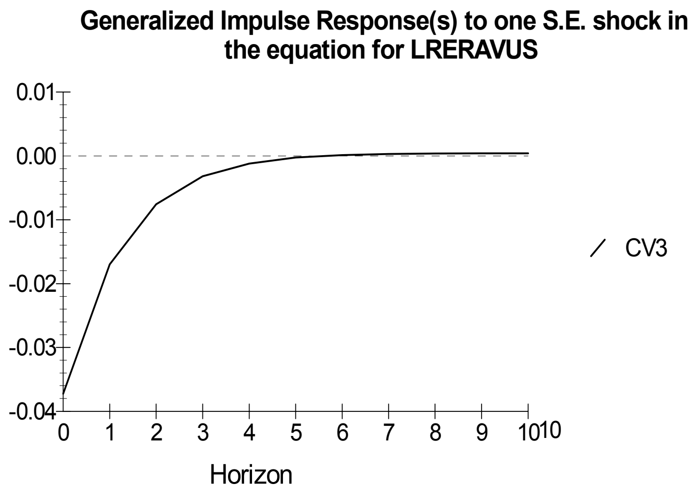


Figure 2. Belgium

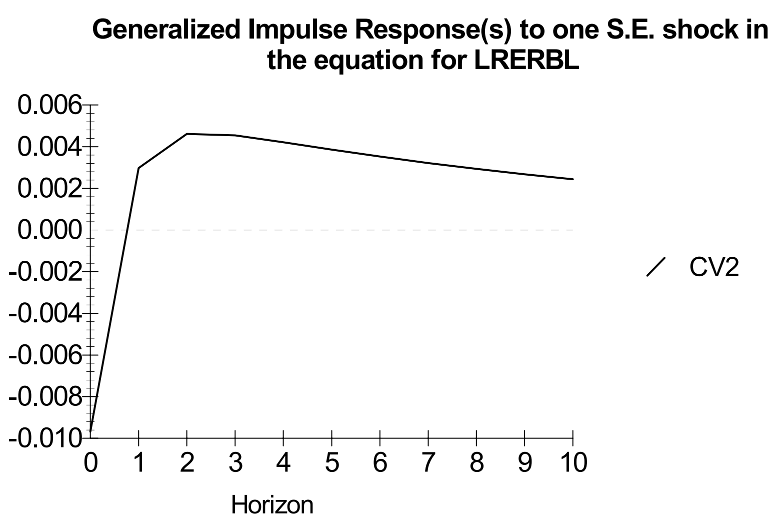


Figure3.England

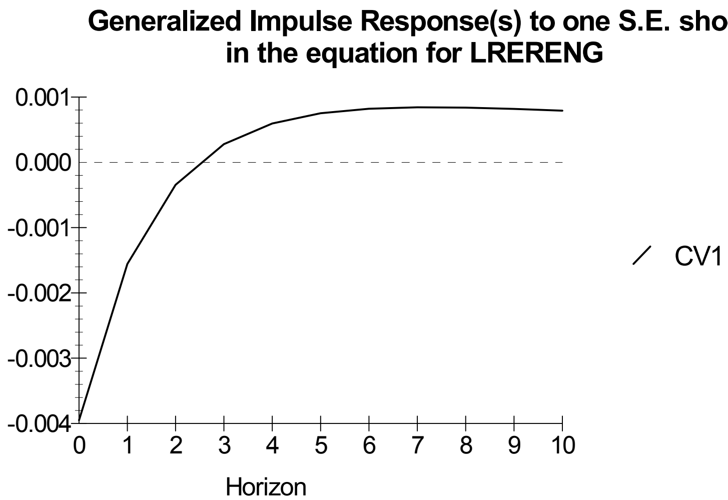


Figure 4. France

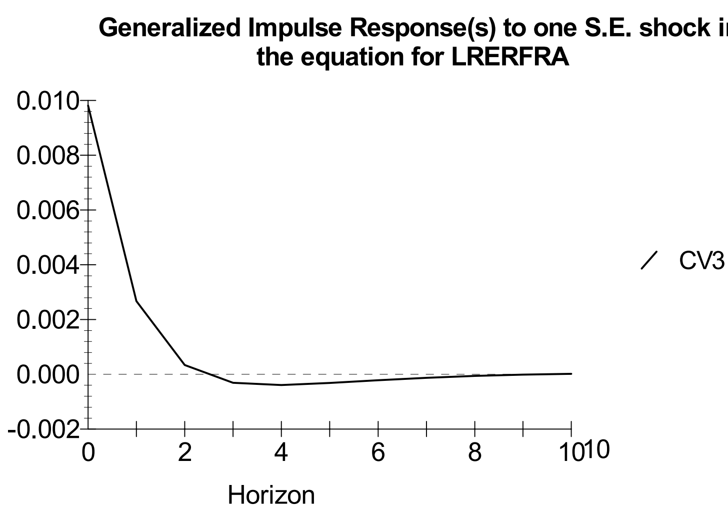


Figure 5. Germany

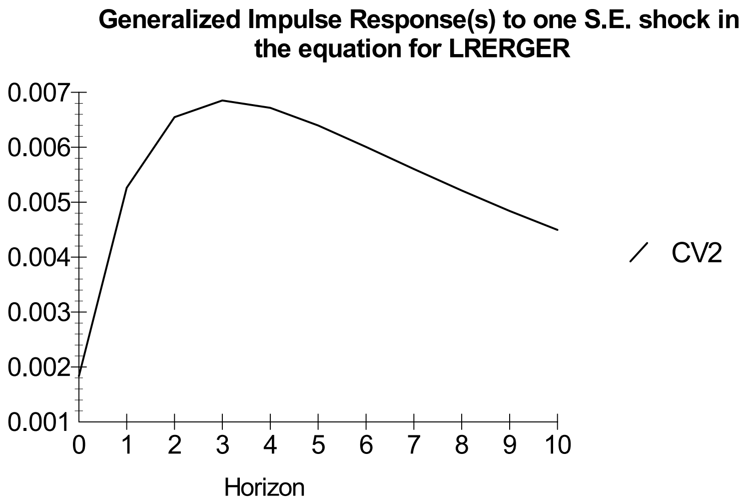


Figure 6. Holland

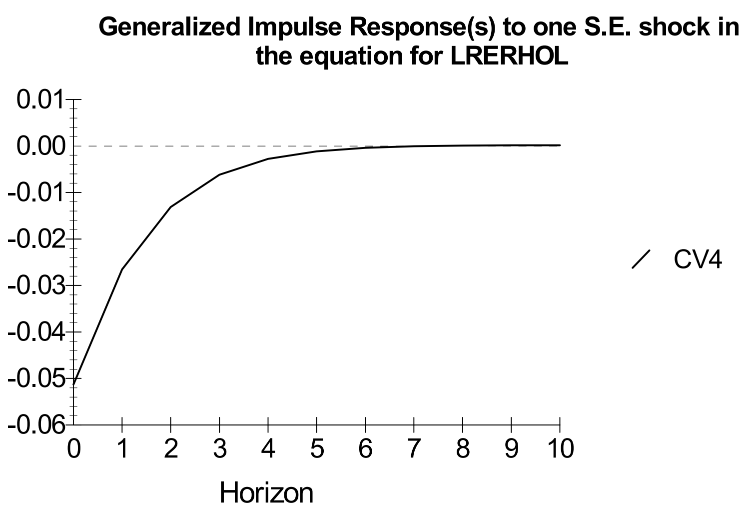


Figure7.Italy

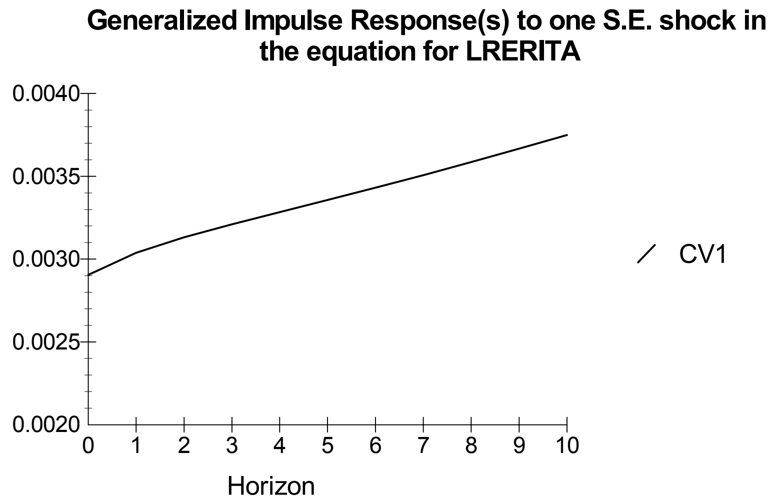


Figure 8. Switzerland

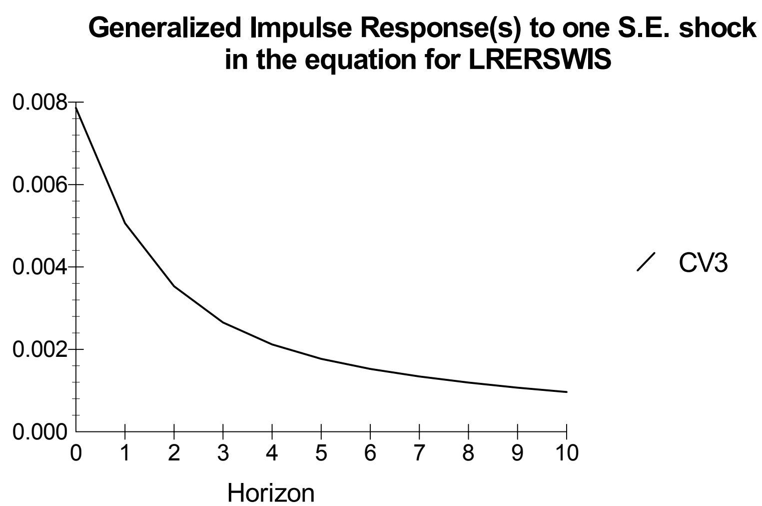


Figure 9. USA

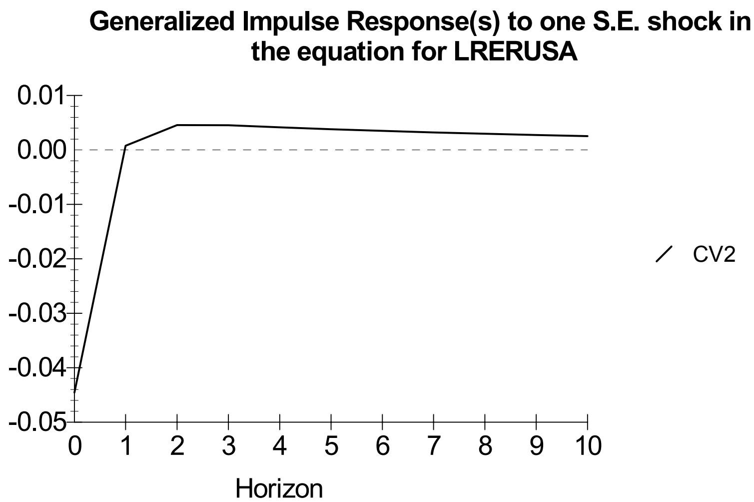
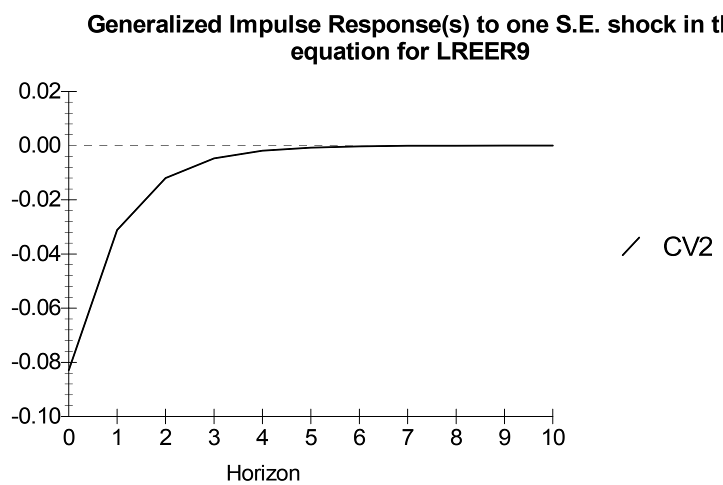


Figure 10. Aggregate



We neither have support for the J-curve effects for disaggregate levels nor aggregate level from the graphical representations. However in some cases such as Belgium and England, depreciation of the Turkish lira seems to improve the trade balance beyond the equilibrium level in the long-run. And in some cases such as France trade surplus become trade deficits. We report the summary findings of the different graphs in table 10

Table 10 Generalized impulse response functions results

Trading Partner	The impact of currency devaluation on the Trade balance
Austria	Devaluation eliminates the trade deficit in six years.
Belgium	Devaluation leads to a trade surplus in less than a year.
England	Devaluation leads to a trade surplus within two and half years.
France	Devaluation reduces the trade surplus and makes it a deficit in four years.
Germany	Devaluation has a positive impact.
Holland	Devaluation eliminates the trade deficit within six years.
Italy	Devaluation has a positive impact even after ten years
Switzerland	Devaluation doesn’t eliminate the trade deficit even after ten years.
USA	Devaluation leads to a trade surplus within a year.
World	Devaluation eliminates the trade deficit in four years.

4.5 CUSUM and CUSUMSQ tests results

The existence of cointegration doesn't necessary imply that the estimated coefficients are stable. We check for the stability of the long-run relation by applying the CUSUM and CUSUMSQ tests. For brevity we provide the figures for the tests result in the appendix and summarise the results for all countries in table 11.Using the CUSUM test there are indication of instability for Germany and Italy case. However if we rely on CUSUMQ statistic there are two indications of instability these are Austria and Germany.

Table 11 Stability test results based on CUSM and CUSUMQ tests

Trading Partner	CUSUM	CUSUMQ
Austria	Stable	Stable
Belgium	Stable	Unstable
England	Unstable	Unstable
France	Stable	Stable
Germany	Stable	Stable
Holland	Stable	Stable
Italy	Stable	Unstable
Switzerland	Stable	Stable
USA	Unstable	Stable
World	Stable	Stable

5 CONCLUSION

Since introduction of the J-Curve phenomenon into the literature, most studies have estimated a reduced form trade balance model to establish the empirical validity of the phenomenon. Recent studies, however, have emphasized the use of bilateral rather than aggregate data due to aggregation bias. As mentioned in chapter 1 almost all the present researches are concentrated on testing the J-curve hypothesis for large developing economies. The convectional wisdom regarding the validity of any theory is that it gains popularity and greater acceptance if it is empirically tested in countries of various sizes and structures. Hence we apply the bilateral J-curve hypothesis for the case of Turkey.

We investigate the short- and long-run impact of real depreciation of the Turkish lira on the Turkish trade balance between Turkey and each of its major trading partners, including Austria, Belgium, England, France, Germany, Holland, Italy, Switzerland, and the United States. In this study we use both aggregate and disaggregated annual data over the 1960-2000 period and modern econometric techniques.

The methodology was based on new bounds testing approach to cointegration technique (ARDL) developed by Pesaran and Shin (1995), Pesaran *et al* (1996) and Pesaran *et al* (2001), the Johansen Juselius (1992) multivariate cointegration technique, generalised impulse response functions and CUSUM and CUSUMQ tests.

Important results have emerged directly from our empirical analysis.

Results indicate there's evidence of cointegration amongst the four variables bilateral trade balance, bilateral real exchange rate and real domestic and foreign incomes, hence there's a long-run relationship amongst these variables.

Results indicate that we don't have any support for the bilateral J-Curve hypothesis for Turkish data. However the Marshal Lerner condition holds in the case of aggregate data. This result is consistent with the long-run result found by Brada *et al* (1997).

The generalised impulse response results don't indicate any support for J-Curve hypothesis as well. However for some cases such as England and Belgium, they do reveal that depreciation of the Turkish lira might improve the trade balance in the long-run.

Finally the CUSUM and CUSUMQ results indicate that some of the bilateral long-run relationships of the Turkish Trade balance equations are stable.

In conclusion basing on our empirical results we do recommend that currency devaluation policy for the Turkish lira shouldn't be applied even for the case of England, Belgium and Italy because their trade balances are not stable in the long-run.

Appendices

Appendix A : Data

Data definitions and sources

Sources of the data: For all countries annual data over 1960-2000 period come from the following sources;

a. The data for bilateral trade flow are taken from Direction of Trade Statistics of the I IMF, various Issues.
b. The data for industrial production index used as a proxy for real GDP,domestic and foreign CPI and nominal exchange rates are taken from the International Financial Statistics and the Central Bank of Turkey (CBT)

Variables

- TB_j = Turkish trade balance with her trading partner. It is defined as the ratio of Turkey's import to country j over her export from country j all data came from source a.
- RER_j = the bilateral real exchange rate between Turkish lira and a trading partner's currency. It is defined as (P_T*NEX / P_j), where P_j is the price level (measured by CPI) of the trading partner j, P_T is the Turkish price level and NEX is the bilateral nominal exchange rate defined as the number of j's currency per Turkish lira. Thus a decrease in RER represents a real deprecation of the Turkish lira source b.
- DY = measure of Turkey's real income. The industrial production index used as a proxy for real GDP of Turkey source b.
- FY_j = the industrial production index used as a proxy for real GDP of Turkey's trading partners source b.

Data

YEAR	AVUSP	BLP	ENGP	FRAP	GERP	HOLP
1960	23.0928	20.7434	8.3596	13.0518	31.2708	22.3595
1961	23.9108	20.9473	8.6588	13.3669	31.9828	22.6519
1962	24.9585	21.2416	9.0142	14.0683	32.9044	23.1697
1963	25.6346	21.6990	9.2012	14.7632	33.8868	23.9443
1964	26.6263	22.6051	9.4967	15.2400	34.6816	25.3309
1965	27.9392	23.5228	9.9530	15.6537	35.8019	26.7988
1966	28.5555	24.5046	10.3420	16.0561	37.0989	28.3523
1967	29.6906	25.2184	10.5926	16.5086	37.6950	29.3409
1968	30.5140	25.9001	11.0938	17.2601	38.3076	30.4193
1969	31.4539	26.8703	11.6997	18.3025	39.0250	32.6790
1970	32.8293	27.9220	12.4440	19.3724	40.3662	33.8815
1971	34.3737	29.1340	13.6148	20.4180	42.4799	36.4150
1972	36.5606	30.7210	14.5798	21.6560	44.8145	39.2524
1973	39.3115	32.8578	15.9225	23.2543	47.9493	42.3979
1974	43.0546	37.0235	18.4547	26.4284	51.2883	46.4721
1975	46.6907	41.7507	22.9273	29.5168	54.3348	51.2182
1976	50.1078	45.5745	26.7177	32.3579	56.6694	55.8572
1977	52.8512	48.8152	30.9610	35.4302	58.7611	59.4735
1978	54.7428	50.9976	33.5048	38.7077	60.3395	61.9000
1979	56.7722	53.2767	38.0164	42.8288	62.8231	64.5063
1980	60.3632	56.8201	44.8482	48.6274	66.2283	68.7260
1981	64.4721	61.1545	50.1761	55.1110	70.4173	73.3639
1982	67.9796	66.4908	54.4865	61.7125	74.1260	77.6646
1983	70.2470	71.5862	56.9967	67.5502	76.5544	79.8570
1984	74.2264	76.1301	59.8200	72.7339	78.3978	82.4712
1985	76.5940	79.8359	63.4483	76.9751	80.1087	84.3052
1986	77.8968	80.8702	65.6231	78.9291	80.0085	84.3896
1987	78.9873	82.1273	68.3457	81.5250	80.2021	83.7923
1988	80.5128	83.0817	71.7001	83.7269	81.2236	84.4177
1989	82.5771	85.6617	77.2908	86.6559	83.4802	85.3312
1990	85.2710	88.6195	84.6145	89.5849	85.7312	87.4253
1991	88.1142	91.4629	89.5678	92.4668	87.1823	90.1647
1992	91.6650	93.6853	92.9111	94.6543	91.5993	93.0351
1993	94.9886	96.2654	94.3646	96.6478	95.6663	95.4393
1994	97.7994	98.5544	96.7015	98.2529	98.3082	98.1131
1995	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000
1996	101.8440	102.0590	102.4490	102.0080	101.4170	102.0170
1997	103.1930	103.7200	105.6580	103.2330	103.3420	104.2170
1998	104.1270	104.7090	109.2690	103.9270	104.3000	106.2830
1999	104.7120	105.8810	110.9690	104.4810	104.9090	108.6330
2000	107.1730	108.5770	114.2170	106.2570	106.9510	111.3750

Year	ITAP	SWISP	TURP	USAP	WORLDP
1960	5.7918	27.1782	.0058048	19.4213	25.3460
1961	5.9483	27.6798	.0058347	19.6301	25.8064
1962	6.1832	28.8743	.0060063	19.8492	26.3768
1963	6.6528	29.8675	.0061928	20.0902	26.9885
1964	7.0441	30.7878	.0062973	20.3531	27.5174
1965	7.3572	31.8391	.0066704	20.6927	28.2473
1966	7.5920	33.3598	.0069613	21.3116	29.2052
1967	7.8268	34.7013	.0074314	21.9032	29.7991
1968	7.9833	35.5385	.0074612	22.8270	30.5673
1969	8.1398	36.4230	.0080482	24.0630	31.5440
1970	8.5312	37.7401	.0086059	25.4816	32.9239
1971	9.0008	40.2207	.0099608	26.5660	34.5230
1972	9.4704	42.8995	.011123	27.4442	36.1294
1973	10.4879	46.6554	.012840	29.1513	38.5503
1974	12.5228	51.2121	.014871	32.3682	41.8282
1975	14.6361	54.6415	.017726	35.3240	44.8294
1976	17.0624	55.5791	.020804	37.3506	47.0100
1977	20.0365	56.2934	.026438	39.7733	49.2672
1978	22.4628	56.8878	.038410	42.8149	51.5772
1979	25.7501	58.9628	.060953	47.6385	55.2308
1980	31.2288	61.3343	.12811	54.0742	60.1513
1981	36.7858	65.3150	.17496	59.6522	65.0348
1982	42.8124	69.0088	.22892	63.3271	68.7266
1983	49.0738	71.0567	.30081	65.3615	70.9580
1984	54.3960	73.1253	.44633	68.1833	73.2905
1985	59.4052	75.6335	.64701	70.6114	75.3601
1986	62.8489	76.1938	.87100	71.9239	75.9662
1987	65.8231	77.2970	1.2093	74.6145	77.4083
1988	69.1886	78.7537	2.1002	77.6058	79.4147
1989	73.4933	80.9860	3.4291	81.3519	82.4160
1990	78.2677	85.6232	5.4973	85.7432	85.7372
1991	83.1985	90.6482	9.1238	89.3744	88.2783
1992	87.4250	94.3113	15.5171	92.0814	91.8404
1993	91.3384	97.3970	25.7735	94.7993	95.2328
1994	95.0170	98.2331	53.1610	97.2711	97.7896
1995	100.0000	100.0000	100.0000	100.0000	100.0000
1996	103.9650	100.8190	180.3470	102.9310	102.1740
1997	106.0890	101.3450	334.9640	105.3370	104.3395
1998	108.1660	101.4480	618.4820	106.9730	105.6365
1999	109.9630	102.1980	1019.7	109.3130	107.1110
2000	112.7530	103.8100	1579.6	113.0040	109.9775

Year	AVUSE	BLE	ENGE	FRAE	GERE	HOLE
1960	4.8480	9.9600	5.9710	16.3240	47.5400	30.9860
1961	4.8950	13.5780	5.8080	23.8570	51.0860	29.7430
1962	3.4160	13.9410	7.2750	14.0420	67.4150	35.8060
1963	2.5760	10.9240	7.5590	16.1050	61.8590	47.1040
1964	3.9630	14.7440	7.1550	24.9400	62.0820	44.5760
1965	5.9010	23.0470	11.2150	19.9740	72.1620	41.3020
1966	4.6750	26.4990	12.0980	24.5860	76.4530	46.7680
1967	4.7840	16.1160	11.1890	28.9210	84.2190	34.2410
1968	6.2020	16.4630	15.3170	21.8090	86.4080	33.9390
1969	7.2400	15.4790	16.3660	27.6750	112.4400	30.2860
1970	8.5110	22.0030	21.2680	39.4660	117.3760	33.7400
1971	8.7580	22.8230	24.4400	48.8700	131.0120	32.1830
1972	11.6610	28.9190	27.4370	50.8290	186.5670	45.6590
1973	13.4530	42.9930	41.0450	72.7170	221.2610	100.5500
1974	18.8850	67.5650	52.4380	66.6010	342.9880	81.6040
1975	24.6170	30.2760	50.8310	61.9360	304.9340	70.0780
1976	27.3450	85.9120	63.7420	108.3510	376.7200	137.6000
1977	35.1590	56.2430	57.4840	94.1180	388.8100	94.3030
1978	34.7720	76.6200	76.8710	127.3830	506.6720	113.7340
1979	46.0670	60.5750	75.3780	137.2940	495.0700	103.0350
1980	53.8520	55.5040	84.3800	163.8970	603.9690	104.5330
1981	95.6940	93.7470	95.9630	215.7210	643.2450	147.9610
1982	98.3360	88.3530	104.7500	194.8260	707.4490	189.0290
1983	88.7780	106.9160	140.8500	180.4500	837.7660	247.0390
1984	126.8330	190.1840	181.1020	200.6100	1279.700	261.0450
1985	122.5010	161.8260	213.3170	215.2810	1391.000	538.7240
1986	111.2170	195.1170	222.3800	298.6800	1444.000	334.2130
1987	188.5220	318.5230	280.2400	499.6030	2183.600	541.4070
1988	179.6550	264.5460	351.0540	498.5710	2149.000	576.1420
1989	131.2970	261.4270	406.8670	594.7950	2175.400	615.9230
1990	178.4700	311.7440	435.3550	736.7990	3063.600	744.7860
1991	212.9980	287.5210	474.8660	688.6570	3412.900	676.0450
1992	229.0380	289.9200	499.7850	808.8810	3660.400	796.3110
1993	226.6060	293.8930	517.0220	771.2050	3654.200	835.0750
1994	248.9730	371.0030	621.0370	851.1870	3934.300	888.8900
1995	275.2930	451.7770	736.7700	1033.100	5036.200	1135.700
1996	290.5240	492.7810	769.7350	1053.200	5189.500	1260.700
1997	300.1690	563.5570	779.1690	1162.800	5253.500	1511.300
1998	304.0120	668.3980	888.6010	1304.700	5459.300	1739.600
1999	358.1420	758.4500	978.3690	1504.900	6145.400	1987.300
2000	375.4700	800.1400	1150.3	1658.500	6582.600	2015.600

Year	ITAE	SWISE	USAE
1960	27.6630	9.5000	58.5440
1961	34.1900	15.4590	65.2050
1962	51.5100	18.7070	74.8970
1963	43.4090	21.1030	49.7830
1964	28.7450	23.5070	72.9870
1965	30.4540	14.1690	82.3290
1966	31.7840	19.6510	80.2400
1967	36.2340	27.0880	92.9320
1968	24.1940	26.7680	72.5330
1969	42.8970	28.4650	59.8850
1970	38.9680	44.1540	56.2350
1971	39.4120	64.8190	68.8460
1972	53.2660	76.0240	103.5060
1973	115.4480	115.8290	130.8100
1974	90.3320	94.2260	144.1960
1975	82.1200	95.7900	147.1200
1976	171.5110	179.6130	191.4110
1977	163.2860	108.7690	121.8230
1978	175.2400	113.4300	153.1500
1979	212.9700	113.7430	104.4990
1980	218.4480	125.3850	127.3900
1981	246.0960	263.7310	267.9310
1982	327.4930	323.8580	251.5980
1983	422.6880	286.4720	231.7200
1984	501.1600	358.2480	368.1690
1985	502.2160	128.3740	505.9920
1986	579.8410	162.2780	549.3330
1987	850.6140	355.8340	714.0870
1988	954.7480	264.8430	760.6610
1989	978.0780	173.1580	970.9610
1990	1106.300	292.7880	967.6220
1991	971.5810	246.3270	912.8700
1992	942.7130	222.7710	865.0260
1993	750.2980	215.8910	986.1380
1994	1033.600	238.9000	1520.100
1995	1457.000	237.9790	1513.800
1996	1446.700	275.7170	1639.300
1997	1387.200	318.2180	2027.100
1998	1557.500	244.2000	2233.300
1999	1758.400	275.8000	2547.100
2000	1978.500	302.8000	2674.100

Year	AVUSM	BLM	ENGM	FRAM	GERM	HOLM
1960	9.7830	10.1910	52.8820	16.3540	98.1320	12.1160
1961	7.8910	7.9660	66.7520	17.6190	84.7090	12.0400
1962	10.5490	7.4730	69.7960	28.6770	105.9020	11.9580
1963	8.1630	9.8060	76.7360	34.1070	103.9800	13.3230
1964	9.8800	8.5790	55.7490	20.6670	80.2130	13.0280
1965	10.7190	7.6650	55.3520	21.3590	83.8440	13.3760
1966	10.7800	10.8080	78.7410	43.3270	112.6950	15.8310
1967	9.9780	11.9000	87.9860	27.1100	133.6560	15.2290
1968	11.7810	13.4480	98.4570	26.9990	155.6590	18.6840
1969	10.4680	14.9890	94.7100	26.6240	147.6090	19.7410
1970	10.1160	17.6030	90.9820	32.4600	176.2770	24.8270
1971	15.5300	23.4320	111.5020	75.4300	209.8650	26.2050
1972	17.6360	34.9340	170.2310	104.6860	301.4230	45.6270
1973	26.7170	70.0210	223.9590	133.5810	437.3080	99.8300
1974	55.3020	106.6480	266.8920	244.8700	680.9300	116.2000
1975	60.1550	129.2450	344.2650	278.6400	1057.7	138.8770
1976	60.9870	103.2730	409.8740	308.6950	945.5890	168.0250
1977	75.4070	159.6740	402.8380	327.6610	944.8700	154.1850
1978	79.2620	97.1980	201.2100	361.2850	820.8540	101.3360
1979	116.9520	94.0040	239.5900	324.6750	663.1030	86.3400
1980	122.5110	152.4980	321.8650	380.1520	845.7350	206.4350
1981	79.8740	152.9070	433.6550	400.0390	958.1260	166.3220
1982	118.3730	146.5360	433.7980	263.2220	1009.1	158.4620
1983	130.6150	148.1040	440.6800	218.3410	1052.8	181.6590
1984	116.0480	198.7700	444.9640	242.5140	1172.5	212.3690
1985	152.5530	235.0280	468.4290	513.9360	1368.8	218.2540
1986	138.8820	310.0370	518.9240	545.3170	1771.9	264.0670
1987	191.9610	402.7040	697.0350	607.8330	2108.8	366.7540
1988	211.7160	477.7810	739.1110	828.8140	2054.4	384.8960
1989	154.8260	443.2640	727.7200	744.9050	2204.0	445.2490
1990	250.8480	522.7320	1013.7	1340.4	3496.8	572.9390
1991	322.1620	557.2230	1165.6	1226.6	3232.0	641.6500
1992	282.4630	551.2140	1187.3	1350.9	3754.5	698.0940
1993	318.8510	682.9760	1545.7	1952.4	4532.9	869.7990
1994	210.7300	531.6950	1169.8	1458.2	3645.6	740.0020
1995	294.0150	911.8950	1829.8	1995.8	5547.6	1084.3
1996	545.4850	1128.6	2510.4	2771.5	7813.5	1448.6
1997	502.6040	1216.7	2763.1	2967.2	8021.2	1484.9
1998	608.2840	1202.6	2683.3	3034.1	7316.3	1446.4
1999	578.1700	1118.9	2458.1	2847.2	7000.3	1320.5
2000	614.1000	1251.4	2644.1	3015.5	7445.1	1360.6

Year	ITAM	SWISM	USAM
1960	30.0690	6.5290	120.6090
1961	42.6910	7.4480	139.4730
1962	33.2390	7.0790	180.4360
1963	34.8620	8.4940	210.6890
1964	31.9420	9.3060	154.5560
1965	36.8780	12.3770	160.6390
1966	53.8080	18.5550	172.5970
1967	50.0200	19.2990	122.7320
1968	67.1020	22.9680	120.6180
1969	75.4990	35.1700	154.5260
1970	74.1350	44.9110	206.0450
1971	120.7280	57.6700	171.9740
1972	165.8500	73.4670	191.8190
1973	170.2060	125.3340	185.4430
1974	270.7020	206.3210	350.3630
1975	357.9400	281.3270	425.7480
1976	386.1200	280.4300	437.8790
1977	454.4070	335.4890	502.7800
1978	290.8850	268.3820	285.3320
1979	459.0760	254.0250	374.0870
1980	284.4320	331.6400	432.3570
1981	372.0450	532.9480	589.3590
1982	414.9710	330.4390	813.5210
1983	510.2740	265.8080	695.1160
1984	630.3430	230.3970	1073.5
1985	658.1730	186.5650	1150.1
1986	865.9810	285.3680	1177.0
1987	1076.0	365.1840	1366.9
1988	1005.7	343.5660	1519.7
1989	1071.0	411.5000	2094.4
1990	1727.1	536.6470	2281.6
1991	1845.4	489.0220	2255.3
1992	1918.6	687.9470	2600.5
1993	2557.8	650.4420	3350.6
1994	2008.5	472.6320	2429.5
1995	3193.1	816.2760	3724.0
1996	4285.8	1014.7	3516.0
1997	4463.1	1104.0	4329.6
1998	4221.7	1017.7	4053.8
1999	3874.1	920.7850	3658.1
2000	3987.1	960.2580	3750.2

Year	AVUSEX	BLEX	ENGEX	FRAEX	GEREX	HOLEX
1960	.30000	.18000	25.2000	1.8200	2.1400	2.3700
1961	.34000	.18000	25.2000	1.8200	2.2500	2.4900
1962	.34000	.18000	25.2000	1.8200	2.2500	2.4900
1963	.34000	.18000	25.2000	1.8200	2.2500	2.4900
1964	.34000	.18000	25.2000	1.8200	2.2500	2.4900
1965	.34000	.18000	25.2000	1.8200	2.2500	2.4900
1966	.34000	.18000	25.2000	1.8200	2.2500	2.4900
1967	.34000	.18000	21.6000	1.8200	2.2500	2.4900
1968	.34000	.18000	21.6000	1.8200	2.2500	2.4900
1969	.34000	.18000	21.6000	1.6200	2.4600	2.4900
1970	.57000	.30000	35.9400	2.6900	4.0900	4.1300
1971	.60000	.31000	36.4800	2.7400	4.3400	4.3200
1972	.60000	.31000	32.9000	2.7400	4.3400	4.3200
1973	.72000	.35000	32.3000	3.0400	5.2500	5.0300
1974	.79000	.37000	31.8200	2.9800	5.6500	5.4000
1975	.84000	.40000	31.0500	3.4800	5.9500	5.7700
1976	.97000	.44000	26.4000	3.3300	6.8500	6.5000
1977	1.1700	.54000	34.7000	3.9000	8.6000	7.8100
1978	1.8900	.88000	50.1000	5.9700	13.8700	12.6600
1979	2.8200	1.2400	79.0200	8.6000	20.2200	18.3300
1980	6.3600	2.8100	210.1200	19.5400	45.1500	41.6500
1981	8.3200	3.4600	250.2500	23.0700	58.3500	53.0300
1982	11.1200	3.9700	300.5500	27.6000	78.2500	70.6300
1983	14.4300	4.9900	401.3800	33.2500	101.7500	90.5000
1984	20.0900	7.0300	516.1800	46.0900	141.2000	124.9100
1985	33.1000	11.4200	826.5600	76.0800	233.1500	207.0000
1986	55.1800	18.6500	1109.3	117.1500	387.9500	343.2000
1987	90.8400	30.4400	1892.6	188.3000	638.6500	567.7700
1988	145.0400	49.0000	3276.1	299.9200	1022.9	905.6100
1989	194.3100	65.0000	3730.5	399.0600	1364.5	1208.9
1990	277.1900	94.2700	5612.8	573.1000	1947.5	1728.5
1991	474.6800	162.1400	9482.3	978.2800	3339.8	2963.2
1992	753.4900	258.3300	12957.8	1556.5	5302.7	4721.3
1993	1189.0	401.2800	21370.4	2458.6	8347.6	7463.4
1994	3511.0	1202.0	59663.0	7143.0	24683.0	22055.0
1995	5900.0	2021.0	92381.0	12144.0	41527.0	37103.0
1996	9819.0	3354.0	181533.0	20481.0	69073.0	61555.0
1997	16252.0	5530.0	338870.0	34120.0	114240.0	101250.0
1998	26662.0	9071.0	522790.0	55843.0	187340.0	166130.0
1999	37773.0	12947.0	824372.0	79620.0	265753.0	236998.0
2000	43212.0	14740.0	976819.0	90648.0	304019.0	271123.0

Year	ITAEX	SWISEX	USAEX	TUREX
1960	1.4000	2.0600	9.0000	5.5700
1961	1.4000	2.0600	9.0000	5.6250
1962	1.4000	2.0600	9.0000	5.6250
1963	1.4000	2.0600	9.0000	5.6250
1964	1.4000	2.0600	9.0000	5.6250
1965	1.4000	2.0600	9.0000	5.6250
1966	1.4000	2.0600	9.0000	5.6250
1967	1.4000	2.0600	9.0000	5.6250
1968	1.4000	2.0600	9.0000	5.6250
1969	1.4000	2.0600	9.0000	5.7300
1970	2.4000	3.4600	14.8500	9.4700
1971	2.4000	3.6500	14.0000	9.1700
1972	2.4000	3.6500	14.0000	9.1700
1973	2.3000	4.3400	14.0000	9.6250
1974	2.0000	5.2200	13.8500	9.7500
1975	2.2000	5.6000	15.0000	10.4750
1976	1.9000	6.8000	16.5000	11.6750
1977	2.2000	8.8500	19.2500	13.9250
1978	3.1000	16.6700	25.0000	19.4350
1979	4.3000	21.8500	35.0000	27.6100
1980	9.5000	50.2000	89.2500	67.2000
1981	10.9000	73.3800	132.3000	95.3250
1982	13.6000	93.0500	184.9000	131.5750
1983	16.8000	127.9700	280.0000	190.8750
1984	23.0000	171.5100	442.5000	291.8500
1985	34.2000	276.7600	574.0000	403.5750
1986	55.7000	464.6000	755.9000	571.9250
1987	86.5000	788.5000	1018.4	828.5000
1988	139.0000	1207.9	1813.0	1417.9
1989	182.0000	1498.0	2311.4	1837.9
1990	258.9000	2283.3	2927.1	2437.3
1991	441.1000	3748.0	5074.8	4207.3
1992	582.6000	5862.2	8555.9	6929.3
1993	846.7000	9789.4	14458.0	11402.8
1994	2357.0	29193.0	38418.0	31550.5
1995	3757.0	51722.0	59501.0	50514.0
1996	7034.0	79503.0	107505.0	88289.0
1997	11570.0	140610.0	204750.0	159495.0
1998	18811.0	228350.0	312720.0	250030.0
1999	26763.0	326505.0	514571.0	390162.0
2000	30709.0	392846.0	681032.0	492525.5

Year	AVUSY	BLY	ENGY	FRAY	GERY	HOLY
1960	27.7576	40.2891	51.8836	39.4432	43.6207	30.5417
1961	28.6522	42.6513	52.0587	41.9856	46.1610	31.5949
1962	29.5390	45.0791	52.5338	43.6926	48.1932	33.1746
1963	30.9090	48.4913	54.3341	46.4529	49.7748	34.7543
1964	33.3442	51.8377	58.7848	53.0891	53.9702	41.8632
1965	34.8145	52.8220	60.4351	51.0982	56.8258	43.4429
1966	36.4440	53.9375	61.3602	53.7527	57.4848	45.0227
1967	36.7361	54.7905	61.8103	55.0799	55.7495	46.6024
1968	39.3884	57.8089	66.5528	57.0707	60.8675	50.5518
1969	43.8502	63.3864	68.8031	63.0432	68.6654	52.9214
1970	47.7098	65.6174	69.1615	66.3613	72.9049	57.6606
1971	50.6419	67.3234	68.8115	70.3430	73.9592	61.6100
1972	54.5944	71.4573	70.0200	74.3247	76.6610	63.9796
1973	57.4844	75.9193	76.3211	79.6336	80.9224	69.5087
1974	60.1748	78.7409	74.7958	81.6244	79.0773	72.6682
1975	56.4273	71.1949	70.7201	76.3155	73.7396	71.8783
1976	60.0170	77.4285	73.0622	82.2880	79.0553	76.6175
1977	62.4213	77.3510	76.8211	83.6153	80.9663	76.6175
1978	63.9887	78.9507	79.0048	85.6061	82.5040	76.6175
1979	68.6813	82.6153	82.0720	88.9242	86.6116	79.7770
1980	70.5889	81.5935	76.6961	89.5878	86.7873	78.9871
1981	69.7927	79.4299	74.2707	88.7086	84.7225	77.3242
1982	69.2146	79.6057	75.7126	88.0932	81.9768	73.9985
1983	69.3063	81.0567	78.4547	87.4778	82.4161	76.7422
1984	73.4190	83.2353	78.4797	87.6536	84.7445	79.8186
1985	76.6327	84.5604	82.8138	87.9173	88.1492	83.1444
1986	77.6209	85.3565	84.8225	88.7086	89.9504	83.1444
1987	77.9339	87.5069	88.2480	90.3790	90.1481	83.9758
1988	81.4647	92.6859	92.4987	94.6870	93.3478	86.4701
1989	86.5107	95.9065	94.4241	98.5553	97.7996	89.7959
1990	93.0277	99.3667	94.1490	100.4020	103.1670	91.4588
1991	94.3701	97.3908	90.9902	99.1968	104.3920	93.9531
1992	93.2957	97.2918	91.2985	97.9920	103.0510	93.7685
1993	91.4269	92.5296	93.2905	94.2771	95.9160	92.6610
1994	95.0148	94.1302	98.3247	97.9920	99.5249	97.1833
1995	100.0000	100.0050	100.0000	100.0000	100.0000	100.0000
1996	100.9290	100.8480	101.3420	100.3010	99.8166	103.8420
1997	107.8970	105.0800	102.3920	104.2170	102.6920	106.5580
1998	118.2860	101.3750	103.4090	109.6910	106.2260	107.6500
1999	123.9850	110.6750	104.2010	111.7820	107.7850	107.6500
2000	132.8580	115.5300	105.9340	115.7630	113.4520	110.4920

Year	ITAY	SWISY	USAY	TURY	WORLDY
1960	28.9144	41.3000	33.2187	19930.0	38.4197
1961	32.0094	42.5000	33.4396	20328.0	39.8003
1962	35.0268	45.2000	36.2263	21585.0	42.2097
1963	38.0792	47.6000	38.4466	23675.0	44.1107
1964	38.4959	50.2000	41.0350	24640.0	47.5026
1965	40.2884	53.8669	45.1125	25413.0	50.9691
1966	45.6974	55.7430	49.1039	28460.0	53.2944
1967	49.4557	57.7457	50.1640	29657.0	52.9567
1968	52.6315	60.3690	52.9505	31635.0	56.9090
1969	54.6464	65.8734	55.4085	33003.0	62.0370
1970	58.1372	71.6250	53.5815	34469.0	63.2432
1971	58.0630	72.7282	54.3140	36897.0	64.1366
1972	60.6080	74.4535	59.5763	40279.0	68.1187
1973	66.4795	78.5504	64.3550	42255.0	72.6387
1974	69.4528	79.4206	64.0190	43633.0	71.5481
1975	63.0729	69.4375	58.2136	46275.0	65.9766
1976	70.9119	69.7239	62.6563	50438.0	70.8558
1977	71.6861	73.7537	67.3605	51944.0	74.1634
1978	73.0511	74.0204	71.0192	52582.0	76.7616
1979	77.9093	75.2782	73.1006	52324.0	79.8561
1980	82.2317	79.5239	71.1032	50870.0	78.9453
1981	80.9484	79.0494	71.9713	53317.0	78.3469
1982	78.4501	76.0666	68.2472	54963.0	75.1120
1983	75.9243	75.5661	70.0205	57279.0	76.2183
1984	78.4651	77.5291	76.2740	61350.0	80.5093
1985	79.3676	81.9959	77.0861	63989.0	82.6176
1986	82.2400	84.9660	77.8327	68315.0	83.8915
1987	85.4325	85.9785	81.5662	75019.0	85.8571
1988	90.5424	92.9721	85.4769	76108.0	89.4124
1989	93.3611	94.4835	86.2050	77347.0	92.0023
1990	93.4694	96.9612	86.8490	84592.0	95.0080
1991	92.6057	96.9467	85.4489	84887.0	94.9204
1992	92.4013	95.9257	87.7170	90323.0	95.3840
1993	90.2028	93.9413	90.5731	97677.0	93.2446
1994	94.8876	97.9804	95.3892	91733.0	97.4571
1995	100.0000	100.0280	100.0000	99028.0	100.0000
1996	99.0984	100.0550	104.3680	106080.0	102.0923
1997	102.3940	104.6760	112.0220	114874.0	107.3570
1998	104.3210	108.4810	118.2940	119303.0	112.2600
1999	104.1130	112.2700	123.3340	112044.0	115.5595
2000	108.1810	121.7490	129.0740	119144.0	121.2630

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Appendix C : ARDL Microfit Results

F-TEST AUSTRIA

```
                       Variable Addition Test (OLS case)
*******************************************************************************
 Dependent variable is DLTBAVUS
 List of the variables added to the regression:
 LTBAVUS         LRYTUR          LRYAVUS         LRERAVUS
 40 observations used for estimation from 1961 to 2000
*******************************************************************************
 Regressor              Coefficient       Standard Error         T-Ratio[Prob]
 INPT                       .24364             6.3352             .038459[.970]
 DLRYTUR                    2.4090             1.6040              1.5019[.143]
 DLRYAVUS                 .2887E-3             1.3788            .2094E-3[1.00]
 DLRERAVUS                  .14019             .19985              .70149[.488]
 LTBAVUS                    .53226             .14929              3.5652[.001]
 LRYTUR                    -.17657             .91518             -.19294[.848]
 LRYAVUS                    .29555             .92547              .31935[.752]
 LRERAVUS                 .0043853            .017952              .24429[.809]
*******************************************************************************
 Lagrange Multiplier Statistic     CHSQ( 4)=  11.4993[.021]
 Likelihood Ratio Statistic        CHSQ( 4)=  13.5581[.009]
 F Statistic                    F(  4,  32)=   3.2278[.025]
*******************************************************************************
                      Variable Addition Test (OLS case)
*******************************************************************************
 Dependent variable is DLRYTUR
 List of the variables added to the regression:
 LTBAVUS         LRYTUR          LRYAVUS         LRERAVUS
 40 observations used for estimation from 1961 to 2000
*******************************************************************************
 Regressor              Coefficient       Standard Error         T-Ratio[Prob]
 INPT                      -2.0161             .57307             -3.5180[.001]
 DLTBAVUS                  .027335            .018200              1.5019[.143]
 DLRYAVUS                  .098046             .14584              .67228[.506]
 DLRERAVUS                -.068266            .017735             -3.8492[.001]
 LTBAVUS                  -.025102            .018267             -1.3742[.179]
 LRYTUR                     .30328            .081488              3.7218[.001]
 LRYAVUS                   -.28867            .084530             -3.4150[.002]
 LRERAVUS                -.0031678           .0018303             -1.7308[.093]
*******************************************************************************

 F Statistic                    F(  4,  32)=   5.0075[.003]
```

F-TEST AUSTRIA

Variable Addition Test (OLS case)

****

Dependent variable is DLRYAVUS

List of the variables added to the regression:

LTBAVUS LRYTUR LRYAVUS LRERAVUS

40 observations used for estimation from 1961 to 2000

****

Regressor	Coefficient	Standard Error	T-Ratio[Prob]
INPT	1.4946	.76812	1.9458[.061]
DLTBAVUS	.4746E-5	.022665	.2094E-3[1.00]
DLRYTUR	.14205	.21129	.67228[.506]
DLRERAVUS	.9922E-3	.025820	.038430[.970]
LTBAVUS	.0057432	.022603	.25408[.801]
LRYTUR	-.20768	.11152	-1.8623[.072]
LRYAVUS	.19333	.11383	1.6984[.099]
LRERAVUS	.0036603	.0022111	1.6554[.108]

****

Joint test of zero restrictions on the coefficients of additional variables:

Lagrange Multiplier Statistic CHSQ(4)= 4.4053[.354]

Likelihood Ratio Statistic CHSQ(4)= 4.6673[.323]

F Statistic F(4, 32)= .99011[.427]

****

Variable Addition Test (OLS case)

****

Dependent variable is DLRERAVUS

List of the variables added to the regression:

LTBAVUS LRYTUR LRYAVUS LRERAVUS

40 observations used for estimation from 1961 to 2000

****

Regressor	Coefficient	Standard Error	T-Ratio[Prob]
INPT	-11.8512	5.1516	-2.3005[.028]
DLTBAVUS	.10803	.15400	.70149[.488]
DLRYTUR	-4.6359	1.2044	-3.8492[.001]
DLRYAVUS	.046510	1.2103	.038430[.970]
LTBAVUS	-.21966	.14996	-1.4648[.153]
LRYTUR	1.5939	.75283	2.1172[.042]
LRYAVUS	-1.1152	.78944	-1.4126[.167]
LRERAVUS	-.0077897	.015713	-.49576[.623]

****

Joint test of zero restrictions on the coefficients of additional variables:

Lagrange Multiplier Statistic CHSQ(4)= 28.6888[.000]

Likelihood Ratio Statistic CHSQ(4)= 50.5235[.000]

F Statistic F(4, 32)= 20.2906[.000]

****

F-TEST BELGIUM

```
                       Variable Addition Test (OLS case)
*******************************************************************************
 Dependent variable is DLTBL
 List of the variables added to the regression:
 LTBL            LRYTUR          LRYBL           LRERBL
 40 observations used for estimation from 1961 to 2000
*******************************************************************************
 Regressor              Coefficient       Standard Error         T-Ratio[Prob]
 INPT                      17.3261            7.2971              2.3744[.024]
 DLRYTUR                    2.6716            1.9710              1.3555[.185]
 DLRYBL                    -1.7011            1.9810             -.85870[.397]
 DLRERBL                   .061565            .24589              .25037[.804]
 LTBL                       .79830            .20291              3.9343[.000]
 LRYTUR                    -2.1808            1.2579             -1.7337[.093]
 LRYBL                      1.4519            1.6979              .85509[.399]
 LRERBL                    .066057           .034773              1.8997[.067]
*******************************************************************************
 Joint test of zero restrictions on the coefficients of additional variables:
 Lagrange Multiplier Statistic     CHSQ( 4)=  13.9655[.007]
 Likelihood Ratio Statistic        CHSQ( 4)=  17.1783[.002]
 F Statistic                    F(  4,  32)=   4.2914[.007]
*******************************************************************************

                       Variable Addition Test (OLS case)
*******************************************************************************
 Dependent variable is DLRYTUR
 List of the variables added to the regression:
 LTBL            LRYTUR          LRYBL           LRERBL
 40 observations used for estimation from 1961 to 2000
*******************************************************************************
 Regressor              Coefficient       Standard Error         T-Ratio[Prob]
 INPT                      -2.0040            .59240             -3.3828[.002]
 DLTBL                     .020324           .014994              1.3555[.185]
 DLRYBL                     .12641            .17333              .72930[.471]
 DLRERBL                  -.064282           .018214             -3.5294[.001]
 LTBL                     -.026217           .021053             -1.2453[.222]
 LRYTUR                     .34297           .097427              3.5203[.001]
 LRYBL                     -.38472            .13345             -2.8829[.007]
 LRERBL                  -.0077213          .0028936             -2.6684[.012]
*******************************************************************************
 Joint test of zero restrictions on the coefficients of additional variables:
 Lagrange Multiplier Statistic     CHSQ( 4)=  13.2291[.010]
 Likelihood Ratio Statistic        CHSQ( 4)=  16.0625[.003]
 F Statistic                    F(  4,  32)=   3.9533[.010]
*******************************************************************************
```

F-TEST BELGIUM

```
                       Variable Addition Test (OLS case)
*******************************************************************************
 Dependent variable is DLRYBL
 List of the variables added to the regression:
 LTBL            LRYTUR          LRYBL           LRERBL
 40 observations used for estimation from 1961 to 2000
*******************************************************************************
 Regressor              Coefficient       Standard Error         T-Ratio[Prob]
 INPT                      1.3566             .65573              2.0688[.047]
 DLTBL                   -.013241            .015420             -.85870[.397]
 DLRYTUR                   .12934             .17735              .72930[.471]
 DLRERBL                -.0022015            .021712             -.10139[.920]
 LTBL                    -.026715            .021288             -1.2549[.219]
 LRYTUR                   -.28430             .10463             -2.7171[.011]
 LRYBL                     .41209             .13284              3.1021[.004]
 LRERBL                  .0068318           .0030025              2.2754[.030]
*******************************************************************************
 Joint test of zero restrictions on the coefficients of additional variables:
 Lagrange Multiplier Statistic     CHSQ( 4)=  12.8435[.012]
 Likelihood Ratio Statistic        CHSQ( 4)=  15.4905[.004]
 F Statistic                    F(  4,  32)=   3.7835[.013]
*******************************************************************************
```

```
                       Variable Addition Test (OLS case)
*******************************************************************************
 Dependent variable is DLRERBL
 List of the variables added to the regression:
 LTBL            LRYTUR          LRYBL           LRERBL
 40 observations used for estimation from 1961 to 2000
*******************************************************************************
 Regressor              Coefficient       Standard Error         T-Ratio[Prob]
 INPT                    -11.7009             5.2941             -2.2102[.034]
 DLTBL                    .031757             .12684              .25037[.804]
 DLRYTUR                  -4.3588             1.2350             -3.5294[.001]
 DLRYBL                   -.14589             1.4388             -.10139[.920]
 LTBL                    -.044791             .17734             -.25258[.802]
 LRYTUR                    1.8145             .88881              2.0415[.050]
 LRYBL                    -1.6961             1.1963             -1.4178[.166]
 LRERBL                  -.021820            .026061             -.83725[.409]
*******************************************************************************
 Joint test of zero restrictions on the coefficients of additional variables:
 Lagrange Multiplier Statistic     CHSQ( 4)=  26.8545[.000]
 Likelihood Ratio Statistic        CHSQ( 4)=  44.5121[.000]
 F Statistic                    F(  4,  32)=  16.3430[.000]
*******************************************************************************
```

F-TEST ENGLAND

```
                      Variable Addition Test (OLS case)
*******************************************************************************
 Dependent variable is DLTBENG
 List of the variables added to the regression:
 LTBENG          LRYTUR          LRYENG          LRERENG
 40 observations used for estimation from 1961 to 2000
*******************************************************************************
 Regressor              Coefficient       Standard Error         T-Ratio[Prob]
 INPT                       -4.6050             2.3537            -1.9565[.059]
 DLRYTUR                     3.0908             1.0518             2.9385[.006]
 DLRYENG                    -3.1615             1.1697            -2.7029[.011]
 DLRERENG                    .16218             .13011             1.2465[.222]
 LTBENG                      .43310             .14144             3.0621[.004]
 LRYTUR                     -.22307             .48759            -.45750[.650]
 LRYENG                      1.4335             1.2171             1.1778[.248]
 LRERENG                  -.0038365            .012092            -.31727[.753]
*******************************************************************************
 Joint test of zero restrictions on the coefficients of additional variables:
 Lagrange Multiplier Statistic     CHSQ( 4)=   9.2408[.055]
 Likelihood Ratio Statistic        CHSQ( 4)=  10.5076[.033]
 F Statistic                  F(  4,  32)=   2.4034[.070]
*******************************************************************************

                      Variable Addition Test (OLS case)
*******************************************************************************
 Dependent variable is DLRYTUR
 List of the variables added to the regression:
 LTBENG          LRYTUR          LRYENG          LRERENG
 40 observations used for estimation from 1961 to 2000
*******************************************************************************
 Regressor              Coefficient       Standard Error         T-Ratio[Prob]
 INPT                        .11685             .37087             .31507[.755]
 DLTBENG                    .068750            .023397             2.9385[.006]
 DLRYENG                     .35420             .18292             1.9364[.062]
 DLRERENG                  -.050984            .017709            -2.8791[.007]
 LTBENG                    -.027950            .023472            -1.1907[.243]
 LRYTUR                      .15362            .067716             2.2685[.030]
 LRYENG                     -.38655             .17236            -2.2427[.032]
 LRERENG                  -.2169E-3           .0018059            -.12011[.905]
*******************************************************************************
 Joint test of zero restrictions on the coefficients of additional variables:
 Lagrange Multiplier Statistic     CHSQ( 4)=   8.2488[.083]
 Likelihood Ratio Statistic        CHSQ( 4)=   9.2380[.055]
 F Statistic                  F(  4,  32)=   2.0784[.107]
*******************************************************************************
```

F-TEST ENGLAND

Variable Addition Test (OLS case)

Dependent variable is DLRYENG

List of the variables added to the regression:

LTBENG LRYTUR LRYENG LRERENG

40 observations used for estimation from 1961 to 2000

Regressor	Coefficient	Standard Error	T-Ratio[Prob]
INPT	-.17218	.33825	-.50902[.614]
DLTBENG	-.058789	.021751	-2.7029[.011]
DLRYTUR	.29611	.15292	1.9364[.062]
DLRERENG	.0017633	.018165	.097072[.923]
LTBENG	.021092	.021613	.97590[.336]
LRYTUR	-.15408	.060894	-2.5303[.017]
LRYENG	.41799	.15258	2.7395[.010]
LRERENG	.8750E-3	.0016443	.53214[.598]

Joint test of zero restrictions on the coefficients of additional variables:

Lagrange Multiplier Statistic	CHSQ(4)=	7.7626[.101]
Likelihood Ratio Statistic	CHSQ(4)=	8.6301[.071]
F Statistic	F(4, 32)=	1.9264[.130]

Variable Addition Test (OLS case)

Dependent variable is DLRERENG

List of the variables added to the regression:

LTBENG LRYTUR LRYENG LRERENG

40 observations used for estimation from 1961 to 2000

Regressor	Coefficient	Standard Error	T-Ratio[Prob]
INPT	.79775	3.3015	.24163[.811]
DLTBENG	.28551	.22906	1.2465[.222]
DLRYTUR	-4.0353	1.4016	-2.8791[.007]
DLRYENG	.16694	1.7198	.097072[.923]
LTBENG	-.45711	.19751	-2.3144[.027]
LRYTUR	.49611	.64312	.77141[.446]
LRYENG	-1.1281	1.6374	-.68896[.496]
LRERENG	.022281	.015580	1.4301[.162]

Joint test of zero restrictions on the coefficients of additional variables:

Lagrange Multiplier Statistic	CHSQ(4)=	27.8187[.000]
Likelihood Ratio Statistic	CHSQ(4)=	47.5592[.000]
F Statistic	F(4, 32)=	18.2699[.000]

F-TEST FRANCE

Variable Addition Test (OLS case)

****

Dependent variable is DLTBFRA

List of the variables added to the regression:

LTBFRA LRYTUR LRYFRA LRERFRA

40 observations used for estimation from 1961 to 2000

****

Regressor	Coefficient	Standard Error	T-Ratio[Prob]
INPT	8.8598	6.6968	1.3230[.195]
DLRYFRA	-2.9225	1.6581	-1.7625[.088]
DLRYTUR	3.2063	1.9506	1.6438[.110]
DLRERFRA	.12946	.22730	.56958[.573]
LTBFRA	.47872	.14996	3.1924[.003]
LRYTUR	-1.0266	1.0984	-.93459[.357]
LRYFRA	.44970	1.2857	.34977[.729]
LRERFRA	.039796	.035668	1.1158[.273]

****

Joint test of zero restrictions on the coefficients of additional variables:

Lagrange Multiplier Statistic	CHSQ(4)=	10.4993[.033]
Likelihood Ratio Statistic	CHSQ(4)=	12.1786[.016]
F Statistic	F(4, 32)=	2.8472[.040]

****

Variable Addition Test (OLS case)

****

Dependent variable is DLRYTUR

List of the variables added to the regression:

LTBFRA LRYTUR LRYFRA LRERFRA

40 observations used for estimation from 1961 to 2000

****

Regressor	Coefficient	Standard Error	T-Ratio[Prob]
INPT	-1.9913	.48409	-4.1134[.000]
DLRYFRA	.18443	.14759	1.2496[.221]
DLTBFRA	.024285	.014774	1.6438[.110]
DLRERFRA	-.060688	.016739	-3.6256[.001]
LTBFRA	-.0070957	.014933	-.47517[.638]
LRYTUR	.33554	.076614	4.3796[.000]
LRYFRA	-.36481	.091699	-3.9784[.000]
LRERFRA	-.0090977	.0027247	-3.3390[.002]

****

Joint test of zero restrictions on the coefficients of additional variables:

Lagrange Multiplier Statistic	CHSQ(4)=	16.3729[.003]
Likelihood Ratio Statistic	CHSQ(4)=	21.0594[.000]
F Statistic	F(4, 32)=	5.5438[.002]

****

F-TEST FRANCE

Variable Addition Test (OLS case)

Dependent variable is DLRYFRA

List of the variables added to the regression:

LTBFRA LRYTUR LRYFRA LRERFRA

40 observations used for estimation from 1961 to 2000

Regressor	Coefficient	Standard Error	T-Ratio[Prob]
INPT	1.4803	.64927	2.2800[.029]
DLRYTUR	.25228	.20188	1.2496[.221]
DLTBFRA	-.030278	.017179	-1.7625[.088]
DLRERFRA	.0034044	.023245	.14646[.884]
LTBFRA	-.0018460	.017523	-.10535[.917]
LRYTUR	-.21608	.10669	-2.0254[.051]
LRYFRA	.20457	.12603	1.6232[.114]
LRERFRA	.0072325	.0034725	2.0828[.045]

Joint test of zero restrictions on the coefficients of additional variables:

Lagrange Multiplier Statistic	CHSQ(4)=	6.4469[.168]
Likelihood Ratio Statistic	CHSQ(4)=	7.0300[.134]
F Statistic	F(4, 32)=	1.5371[.215]

Variable Addition Test (OLS case)

Dependent variable is DLRERFRA

List of the variables added to the regression:

LTBFRA LRYTUR LRYFRA LRERFRA

40 observations used for estimation from 1961 to 2000

Regressor	Coefficient	Standard Error	T-Ratio[Prob]
INPT	-13.4993	4.7569	-2.8379[.008]
DLRYTUR	-4.7978	1.3233	-3.6256[.001]
DLTBFRA	.077521	.13610	.56958[.573]
DLRYFRA	.19676	1.3435	.14646[.884]
LTBFRA	-.061682	.13280	-.46449[.645]
LRYTUR	2.0069	.78506	2.5563[.016]
LRYFRA	-1.7418	.94803	-1.8372[.075]
LRERFRA	-.033933	.027485	-1.2346[.226]

Joint test of zero restrictions on the coefficients of additional variables:

Lagrange Multiplier Statistic	CHSQ(4)=	27.4181[.000]
Likelihood Ratio Statistic	CHSQ(4)=	46.2649[.000]
F Statistic	F(4, 32)=	17.4334[.000]

F-TEST GERMANY

```
                       Variable Addition Test (OLS case)
*******************************************************************************
 Dependent variable is DLTBGER
 List of the variables added to the regression:
 LTBGER          LRYTUR          LRYGER          LRERGER
 40 observations used for estimation from 1961 to 2000
*******************************************************************************
 Regressor              Coefficient       Standard Error         T-Ratio[Prob]
 INPT                       6.2527            2.6942              2.3209[.027]
 DLRYTUR                    2.6594            .84165              3.1598[.003]
 DLRYGER                   -2.5339            .75580             -3.3525[.002]
 DLRERGER                   .10475            .11799              .88784[.381]
 LTBGER                     .29266            .11825              2.4748[.019]
 LRYTUR                    -1.1725            .47392             -2.4741[.019]
 LRYGER                     1.4375            .62841              2.2875[.029]
 LRERGER                   .038098           .015117              2.5203[.017]
*******************************************************************************
 Joint test of zero restrictions on the coefficients of additional variables:
 Lagrange Multiplier Statistic     CHSQ( 4)=   9.1742[.057]
 Likelihood Ratio Statistic        CHSQ( 4)=  10.4211[.034]
 F Statistic                    F(  4,  32)=   2.3809[.072]
*******************************************************************************
```

```
                       Variable Addition Test (OLS case)
*******************************************************************************
 Dependent variable is DLRYTUR
 List of the variables added to the regression:
 LTBGER          LRYTUR          LRYGER          LRERGER
 40 observations used for estimation from 1961 to 2000
*******************************************************************************
 Regressor              Coefficient       Standard Error         T-Ratio[Prob]
 INPT                      -1.5978            .45317             -3.5258[.001]
 DLTBGER                   .089421           .028300              3.1598[.003]
 DLRYGER                    .26133            .15434              1.6933[.100]
 DLRERGER                 -.063749           .018778             -3.3949[.002]
 LTBGER                   -.041531           .022501             -1.8457[.074]
 LRYTUR                     .29221           .079553              3.6731[.001]
 LRYGER                    -.34162            .10864             -3.1445[.004]
 LRERGER                 -.0081010          .0026755             -3.0279[.005]
*******************************************************************************
 Joint test of zero restrictions on the coefficients of additional variables:
 Lagrange Multiplier Statistic     CHSQ( 4)=  13.6855[.008]
 Likelihood Ratio Statistic        CHSQ( 4)=  16.7504[.002]
 F Statistic                    F(  4,  32)=   4.1606[.008]
*******************************************************************************
```

F-TEST GERMANY

```
                      Variable Addition Test (OLS case)
*******************************************************************************
 Dependent variable is DLRYGER
 List of the variables added to the regression:
 LTBGER          LRYTUR          LRYGER          LRERGER
 40 observations used for estimation from 1961 to 2000
*******************************************************************************
 Regressor              Coefficient       Standard Error         T-Ratio[Prob]
 INPT                       1.5891            .51422              3.0903[.004]
 DLTBGER                   -.10259           .030599             -3.3525[.002]
 DLRYTUR                    .31466            .18583              1.6933[.100]
 DLRERGER                 .0052911           .024012              .22035[.827]
 LTBGER                    .011898           .025886              .45963[.649]
 LRYTUR                    -.28570           .091006             -3.1393[.004]
 LRYGER                     .34835            .12170              2.8625[.007]
 LRERGER                  .0082731          .0029915              2.7655[.009]
*******************************************************************************
 Joint test of zero restrictions on the coefficients of additional variables:
 Lagrange Multiplier Statistic     CHSQ( 4)=  10.2354[.037]
 Likelihood Ratio Statistic        CHSQ( 4)=  11.8223[.019]
 F Statistic                    F(  4,  32)=   2.7510[.045]
*******************************************************************************
```

```
                      Variable Addition Test (OLS case)
*******************************************************************************
 Dependent variable is DLRERGER
 List of the variables added to the regression:
 LTBGER          LRYTUR          LRYGER          LRERGER
 40 observations used for estimation from 1961 to 2000
*******************************************************************************
 Regressor              Coefficient       Standard Error         T-Ratio[Prob]
 INPT                     -10.4147            3.8974             -2.6722[.012]
 DLTBGER                    .22950            .25849              .88784[.381]
 DLRYTUR                   -4.1537            1.2235             -3.3949[.002]
 DLRYGER                    .28633            1.2994              .22035[.827]
 LTBGER                    -.42473            .17568             -2.4176[.021]
 LRYTUR                     1.4187            .72340              1.9612[.059]
 LRYGER                    -.94697            .98926             -.95725[.346]
 LRERGER                  -.030906           .023879             -1.2943[.205]
*******************************************************************************
 Joint test of zero restrictions on the coefficients of additional variables:
 Lagrange Multiplier Statistic     CHSQ( 4)=  28.9668[.000]
 Likelihood Ratio Statistic        CHSQ( 4)=  51.5187[.000]
 F Statistic                    F(  4,  32)=  21.0033[.000]
*******************************************************************************
```

F-TEST HOLLAND

```
                      Variable Addition Test (OLS case)
*******************************************************************************
 Dependent variable is DLTBHOL
 List of the variables added to the regression:
 LTBHOL          LRYTUR          LRYHOL          LRERHOL
 40 observations used for estimation from 1961 to 2000
*******************************************************************************
 Regressor              Coefficient       Standard Error         T-Ratio[Prob]
 INPT                       7.6453            8.5164              .89771[.376]
 DLRYTUR                    .83157            1.6828              .49416[.625]
 DLRYHOL                    .96871            1.6257              .59586[.555]
 DLRERHOL                   .11240            .19825              .56694[.575]
 LTBHOL                     .50849            .17726              2.8686[.007]
 LRYTUR                    -.57206            1.2590             -.45436[.653]
 LRYHOL                    -.32262            1.3025             -.24768[.806]
 LRERHOL                   .033310           .035166              .94722[.351]
*******************************************************************************
 Joint test of zero restrictions on the coefficients of additional variables:
 Lagrange Multiplier Statistic     CHSQ( 4)=  10.0021[.040]
 Likelihood Ratio Statistic        CHSQ( 4)=  11.5101[.021]
 F Statistic                    F(  4,  32)=   2.6674[.050]
*******************************************************************************
```

```
                      Variable Addition Test (OLS case)
*******************************************************************************
 Dependent variable is DLRYTUR
 List of the variables added to the regression:
 LTBHOL          LRYTUR          LRYHOL          LRERHOL
 40 observations used for estimation from 1961 to 2000
*******************************************************************************
 Regressor              Coefficient       Standard Error         T-Ratio[Prob]
 INPT                      -2.9522            .73619             -4.0101[.000]
 DLTBHOL                  .0091072           .018430              .49416[.625]
 DLRYHOL                    .21435            .16683              1.2848[.208]
 DLRERHOL                 -.062603           .017672             -3.5426[.001]
 LTBHOL                   .0086439           .020743              .41670[.680]
 LRYTUR                     .43557            .10744              4.0539[.000]
 LRYHOL                    -.40339            .11633             -3.4677[.002]
 LRERHOL                  -.010628          .0032239             -3.2967[.002]
*******************************************************************************
 Joint test of zero restrictions on the coefficients of additional variables:
 Lagrange Multiplier Statistic     CHSQ( 4)=  15.3933[.004]
 Likelihood Ratio Statistic        CHSQ( 4)=  19.4345[.001]
 F Statistic                    F(  4,  32)=   5.0046[.003]
*******************************************************************************
```

F-TEST HOLLAND

```
                       Variable Addition Test (OLS case)
*******************************************************************************
 Dependent variable is DLRYHOL
 List of the variables added to the regression:
 LTBHOL          LRYTUR          LRYHOL          LRERHOL
 40 observations used for estimation from 1961 to 2000
*******************************************************************************
 Regressor              Coefficient       Standard Error         T-Ratio[Prob]
 INPT                       2.1560              .85102             2.5334[.016]
 DLTBHOL                   .011328             .019011             .59586[.555]
 DLRYTUR                    .22887              .17813             1.2848[.208]
 DLRERHOL                 .0064027             .021516             .29758[.768]
 LTBHOL                   -.047992             .019747            -2.4303[.021]
 LRYTUR                    -.34112              .12256            -2.7833[.009]
 LRYHOL                     .36734              .12515             2.9353[.006]
 LRERHOL                  .0072485            .0036366             1.9932[.055]
*******************************************************************************
 Joint test of zero restrictions on the coefficients of additional variables:
 Lagrange Multiplier Statistic     CHSQ( 4)=  13.0519[.011]
 Likelihood Ratio Statistic        CHSQ( 4)=  15.7987[.003]
 F Statistic                    F(  4,  32)=   3.8747[.011]
*******************************************************************************
```

```
                       Variable Addition Test (OLS case)
*******************************************************************************
 Dependent variable is DLRERHOL
 List of the variables added to the regression:
 LTBHOL          LRYTUR          LRYHOL          LRERHOL
 40 observations used for estimation from 1961 to 2000
*******************************************************************************
 Regressor              Coefficient       Standard Error         T-Ratio[Prob]
 INPT                     -15.3288              7.1547            -2.1425[.040]
 DLTBHOL                   .088478              .15606             .56694[.575]
 DLRYTUR                   -4.4998              1.2702            -3.5426[.001]
 DLRYHOL                    .43101              1.4484             .29758[.768]
 LTBHOL                    .044271              .17617             .25130[.803]
 LRYTUR                     2.0465              1.0607             1.9295[.063]
 LRYHOL                    -1.4572              1.1277            -1.2921[.206]
 LRERHOL                  -.032826             .031098            -1.0556[.299]
*******************************************************************************
 Joint test of zero restrictions on the coefficients of additional variables:
 Lagrange Multiplier Statistic     CHSQ( 4)=  26.1616[.000]
 Likelihood Ratio Statistic        CHSQ( 4)=  42.4573[.000]
 F Statistic                    F(  4,  32)=  15.1241[.000]
*******************************************************************************
```

F-TEST ITALY

Variable Addition Test (OLS case)

```
*******************************************************************************
 Dependent variable is DLTBITA
 List of the variables added to the regression:
 LTBITA          LRYTUR          LRYITA          LRERITA
 40 observations used for estimation from 1961 to 2000
*******************************************************************************
 Regressor              Coefficient       Standard Error         T-Ratio[Prob]
 INPT                        6.5386               6.3536            1.0291[.311]
 DLRYTUR                     3.1743               1.6091            1.9727[.057]
 DLRYITA                    -3.1710               1.3573           -2.3363[.026]
 DLRERITA                   .093015               .20629            .45088[.655]
 LTBITA                      .33520               .13656            2.4547[.020]
 LRYTUR                     -.72591               .95577           -.75950[.453]
 LRYITA                      .26718               1.0237            .26099[.796]
 LRERITA                    .025574              .030935            .82670[.415]
*******************************************************************************
 Joint test of zero restrictions on the coefficients of additional variables:
 Lagrange Multiplier Statistic     CHSQ( 4)=   7.3821[.117]
 Likelihood Ratio Statistic        CHSQ( 4)=   8.1608[.086]
 F Statistic                    F(  4,  32)=   1.8106[.151]
*******************************************************************************
```

Variable Addition Test (OLS case)

```
*******************************************************************************
 Dependent variable is DLRYTUR
 List of the variables added to the regression:
 LTBITA          LRYTUR          LRYITA          LRERITA
 40 observations used for estimation from 1961 to 2000
*******************************************************************************
 Regressor              Coefficient       Standard Error         T-Ratio[Prob]
 INPT                       -1.6899               .59959           -2.8185[.008]
 DLTBITA                    .034157              .017315            1.9727[.057]
 DLRYITA                     .27917               .14412            1.9371[.062]
 DLRERITA                  -.050646              .019511           -2.5958[.014]
 LTBITA                   -.0077759              .015380           -.50558[.617]
 LRYTUR                      .25052              .089697            2.7929[.009]
 LRYITA                     -.23064              .098176           -2.3492[.025]
 LRERITA                  -.0061915             .0030528           -2.0281[.051]
*******************************************************************************
 Joint test of zero restrictions on the coefficients of additional variables:
 Lagrange Multiplier Statistic     CHSQ( 4)=  10.0808[.039]
 Likelihood Ratio Statistic        CHSQ( 4)=  11.6151[.020]
 F Statistic                    F(  4,  32)=   2.6955[.048]
*******************************************************************************
```

F-TEST ITALY

```
                    Variable Addition Test (OLS case)
*******************************************************************************
 Dependent variable is DLRYITA
 List of the variables added to the regression:
 LTBITA          LRYTUR          LRYITA          LRERITA
 40 observations used for estimation from 1961 to 2000
*******************************************************************************
 Regressor              Coefficient       Standard Error         T-Ratio[Prob]
 INPT                      1.8005              .70924              2.5387[.016]
 DLTBITA                 -.045951             .019669             -2.3363[.026]
 DLRYTUR                   .37595              .19408              1.9371[.062]
 DLRERITA                 .021093             .024631              .85636[.398]
 LTBITA                  .4224E-3             .017919             .023572[.981]
 LRYTUR                   -.22880              .10881             -2.1027[.043]
 LRYITA                    .16578              .11983              1.3834[.176]
 LRERITA                 .0069351            .0035582              1.9490[.060]
*******************************************************************************
 Joint test of zero restrictions on the coefficients of additional variables:
 Lagrange Multiplier Statistic     CHSQ( 4)=  10.6419[.031]
 Likelihood Ratio Statistic        CHSQ( 4)=  12.3725[.015]
 F Statistic                    F(  4,  32)=   2.8999[.037]
*******************************************************************************

                    Variable Addition Test (OLS case)
*******************************************************************************
 Dependent variable is DLRERITA
 List of the variables added to the regression:
 LTBITA          LRYTUR          LRYITA          LRERITA
 40 observations used for estimation from 1961 to 2000
*******************************************************************************
 Regressor              Coefficient       Standard Error         T-Ratio[Prob]
 INPT                     -7.0743              5.3728             -1.3167[.197]
 DLTBITA                  .067870              .15053              .45088[.655]
 DLRYTUR                  -3.4344              1.3231             -2.5958[.014]
 DLRYITA                   1.0621              1.2403              .85636[.398]
 LTBITA                   -.16299              .12385             -1.3160[.198]
 LRYTUR                    .75851              .81277              .93324[.358]
 LRYITA                   -.11391              .87517             -.13015[.897]
 LRERITA                 .0080170             .026668              .30062[.766]
*******************************************************************************
 Joint test of zero restrictions on the coefficients of additional variables:
 Lagrange Multiplier Statistic     CHSQ( 4)=  26.7633[.000]
 Likelihood Ratio Statistic        CHSQ( 4)=  44.2356[.000]
 F Statistic                    F(  4,  32)=  16.1753[.000]
*******************************************************************************
```

F-TEST SWITZERLAND

Variable Addition Test (OLS case)

Dependent variable is DLTBSWIS

List of the variables added to the regression:

LTBSWIS LRYTUR LRYSWIS LRERSWIS

40 observations used for estimation from 1961 to 2000

Regressor	Coefficient	Standard Error	T-Ratio[Prob]
INPT	2.3271	5.5197	.42161[.676]
DLRYTUR	.47946	1.7597	.27248[.787]
DLRYSWIS	3.3306	1.8076	1.8425[.075]
DLRERSWIS	-.23722	.24855	-.95443[.347]
LTBSWIS	.52150	.15439	3.3777[.002]
LRYTUR	-.19299	.83693	-.23059[.819]
LRYSWIS	-.085059	1.0832	-.078525[.938]
LRERSWIS	-.0059145	.024279	-.24360[.809]

Joint test of zero restrictions on the coefficients of additional variables:

Lagrange Multiplier Statistic CHSQ(4)= 12.2000[.016]

Likelihood Ratio Statistic CHSQ(4)= 14.5538[.006]

F Statistic F(4, 32)= 3.5108[.017]

Variable Addition Test (OLS case)

Dependent variable is DLRYTUR

List of the variables added to the regression:

LTBSWIS LRYTUR LRYSWIS LRERSWIS

40 observations used for estimation from 1961 to 2000

Regressor	Coefficient	Standard Error	T-Ratio[Prob]
INPT	-1.2292	.51113	-2.4050[.022]
DLTBSWIS	.0048277	.017718	.27248[.787]
DLRYSWIS	.077319	.19027	.40636[.687]
DLRERSWIS	-.072104	.021846	-3.3005[.002]
LTBSWIS	-.014873	.017852	-.83317[.411]
LRYTUR	.19130	.076948	2.4861[.018]
LRYSWIS	-.17626	.10414	-1.6924[.100]
LRERSWIS	-.0035035	.0023586	-1.4854[.147]

Joint test of zero restrictions on the coefficients of additional variables:

Lagrange Multiplier Statistic CHSQ(4)= 8.6326[.071]

Likelihood Ratio Statistic CHSQ(4)= 9.7245[.045]

F Statistic F(4, 32)= 2.2017[.091]

F-TEST SWITZERLAND

```
                       Variable Addition Test (OLS case)
*******************************************************************************
 Dependent variable is DLRYSWIS
 List of the variables added to the regression:
 LTBSWIS         LRYTUR          LRYSWIS         LRERSWIS
 40 observations used for estimation from 1961 to 2000
*******************************************************************************
 Regressor              Coefficient       Standard Error         T-Ratio[Prob]
 INPT                       1.2575             .46420              2.7091[.011]
 DLTBSWIS                  .028798            .015630              1.8425[.075]
 DLRYTUR                   .066396             .16339              .40636[.687]
 DLRERSWIS                 .044553            .022076              2.0182[.052]
 LTBSWIS                  -.033432            .015642             -2.1373[.040]
 LRYTUR                    -.22381            .067092             -3.3358[.002]
 LRYSWIS                    .27460            .088266              3.1111[.004]
 LRERSWIS                 .0059396           .0020010              2.9683[.006]
*******************************************************************************
 Joint test of zero restrictions on the coefficients of additional variables:
 Lagrange Multiplier Statistic     CHSQ( 4)=  17.5129[.002]
 Likelihood Ratio Statistic        CHSQ( 4)=  23.0376[.000]
 F Statistic                    F(  4,  32)=   6.2304[.001]
*******************************************************************************

                       Variable Addition Test (OLS case)
*******************************************************************************
 Dependent variable is DLRERSWIS
 List of the variables added to the regression:
 LTBSWIS         LRYTUR          LRYSWIS         LRERSWIS
 40 observations used for estimation from 1961 to 2000
*******************************************************************************
 Regressor              Coefficient       Standard Error         T-Ratio[Prob]
 INPT                     -11.3094             3.3274             -3.3989[.002]
 DLTBSWIS                  -.11668             .12225             -.95443[.347]
 DLRYTUR                   -3.5222             1.0672             -3.3005[.002]
 DLRYSWIS                   2.5344             1.2558              2.0182[.052]
 LTBSWIS                    .10082             .12485              .80756[.425]
 LRYTUR                     1.7170             .50296              3.4138[.002]
 LRYSWIS                   -1.5585             .70804             -2.2011[.035]
 LRERSWIS                 -.025019            .016460             -1.5200[.138]
*******************************************************************************
 Joint test of zero restrictions on the coefficients of additional variables:
 Lagrange Multiplier Statistic     CHSQ( 4)=  29.7085[.000]
 Likelihood Ratio Statistic        CHSQ( 4)=  54.3025[.000]
 F Statistic                    F(  4,  32)=  23.0937[.000]
*******************************************************************************
```

F-TEST USA

```
                       Variable Addition Test (OLS case)
*******************************************************************************
 Dependent variable is DLTBUSA
 List of the variables added to the regression:
 LTBUSA          LRYTUR          LRYUSA          LRERUSA
 40 observations used for estimation from 1961 to 2000
*******************************************************************************
 Regressor              Coefficient       Standard Error         T-Ratio[Prob]
 INPT                       4.0290             3.4538              1.1666[.252]
 DLRYTUR                   .072021             1.4301             .050361[.960]
 DLRYUSA                   -.77637             1.1366             -.68307[.499]
 DLRERUSA                  -.49784             .19531             -2.5489[.016]
 LTBUSA                     1.1090             .18028              6.1515[.000]
 LRYTUR                    -1.0592             .59099             -1.7923[.083]
 LRYUSA                     1.6128             .79389              2.0315[.051]
 LRERUSA                   .035282            .015659              2.2531[.031]
*******************************************************************************
 Joint test of zero restrictions on the coefficients of additional variables:
 Lagrange Multiplier Statistic     CHSQ( 4)=  21.7115[.000]
 Likelihood Ratio Statistic        CHSQ( 4)=  31.3043[.000]
 F Statistic                    F(  4,  32)=   9.4973[.000]
*******************************************************************************

                       Variable Addition Test (OLS case)
*******************************************************************************
 Dependent variable is DLRYTUR
 List of the variables added to the regression:
 LTBUSA          LRYTUR          LRYUSA          LRERUSA
 40 observations used for estimation from 1961 to 2000
*******************************************************************************
 Regressor              Coefficient       Standard Error         T-Ratio[Prob]
 INPT                      -.99925             .39850             -2.5075[.017]
 DLTBUSA                  .0011004            .021850             .050361[.960]
 DLRYUSA                    .28816             .13203              2.1826[.037]
 DLRERUSA                 -.080328            .022351             -3.5940[.001]
 LTBUSA                    .032394            .032420              .99921[.325]
 LRYTUR                     .17133            .070390              2.4340[.021]
 LRYUSA                    -.19244            .098561             -1.9525[.060]
 LRERUSA                  .2806E-3           .0020829              .13473[.894]
*******************************************************************************
 Joint test of zero restrictions on the coefficients of additional variables:
 Lagrange Multiplier Statistic     CHSQ( 4)=  12.8688[.012]
 Likelihood Ratio Statistic        CHSQ( 4)=  15.5278[.004]
 F Statistic                    F(  4,  32)=   3.7945[.012]
*******************************************************************************
```

F-TEST USA

```
                      Variable Addition Test (OLS case)
*******************************************************************************
 Dependent variable is DLRYUSA
 List of the variables added to the regression:
 LTBUSA          LRYTUR          LRYUSA          LRERUSA
 40 observations used for estimation from 1961 to 2000
*******************************************************************************
 Regressor              Coefficient       Standard Error         T-Ratio[Prob]
 INPT                       1.1305              .50653             2.2319[.033]
 DLTBUSA                  -.018511            .027099            -.68307[.499]
 DLRYTUR                    .44967              .20603             2.1826[.037]
 DLRERUSA                  .016794            .032945             .50975[.614]
 LTBUSA                   -.017841            .041005            -.43509[.666]
 LRYTUR                    -.17852            .090374            -1.9754[.057]
 LRYUSA                     .19613              .12555             1.5622[.128]
 LRERUSA                  .0029924           .0025484             1.1743[.249]
*******************************************************************************
 Joint test of zero restrictions on the coefficients of additional variables:
 Lagrange Multiplier Statistic     CHSQ( 4)=   7.2102[.125]
 Likelihood Ratio Statistic        CHSQ( 4)=   7.9505[.093]
 F Statistic                    F(  4,  32)=   1.7591[.161]
*******************************************************************************
```

```
                      Variable Addition Test (OLS case)
*******************************************************************************
 Dependent variable is DLRERUSA
 List of the variables added to the regression:
 LTBUSA          LRYTUR          LRYUSA          LRERUSA
 40 observations used for estimation from 1961 to 2000
*******************************************************************************
 Regressor              Coefficient       Standard Error         T-Ratio[Prob]
 INPT                      -3.9722              2.8240            -1.4066[.169]
 DLTBUSA                   -.33899              .13300            -2.5489[.016]
 DLRYTUR                   -3.5800              .99610            -3.5940[.001]
 DLRYUSA                    .47962              .94090             .50975[.614]
 LTBUSA                     .68551              .18335             3.7388[.001]
 LRYTUR                     .36092              .50757             .71107[.482]
 LRYUSA                    .030505              .69605            .043826[.965]
 LRERUSA                   .028870            .012939             2.2313[.033]
*******************************************************************************
 Joint test of zero restrictions on the coefficients of additional variables:
 Lagrange Multiplier Statistic     CHSQ( 4)=  32.5087[.000]
 Likelihood Ratio Statistic        CHSQ( 4)=  67.0053[.000]
 F Statistic                    F(  4,  32)=  34.7160[.000]
*******************************************************************************
```

F-Test Aggregate

```
                       Variable Addition Test (OLS case)
*******************************************************************************
 Dependent variable is DLTBTUR
 List of the variables added to the regression:
 LTBTUR(-1)      LRYTUR(-1)      LRYWORLD(-1)    LREER9(-1)
 39 observations used for estimation from 1962 to 2000
*******************************************************************************
 Regressor              Coefficient       Standard Error         T-Ratio[Prob]
 INPT                      1.6635             1.1695              1.4224[.165]
 DLTBTUR(-1)              -.030501            .19344             -.15768[.876]
 DLRYTUR(-1)              -.98406             .91806             -1.0719[.292]
 DLWORLD(-1)               .24270             1.0118              .23987[.812]
 DLREER9(-1)              -.22183             .30872             -.71855[.478]
 LTBTUR(-1)               -.49757             .22888             -2.1739[.038]
 LRYTUR(-1)               -.15168             .48598             -.31212[.757]
 LRYWORLD(-1)              .49060             .75449              .65024[.520]
 LREER9(-1)               -.29817             .27473             -1.0853[.286]
*******************************************************************************
 Joint test of zero restrictions on the coefficients of additional variables:
 Lagrange Multiplier Statistic     CHSQ( 4)=   7.5198[.111]
 Likelihood Ratio Statistic        CHSQ( 4)=   8.3539[.079]
 F Statistic                    F(  4,  30)=   1.7916[.157]
*******************************************************************************
                       Variable Addition Test (OLS case)
*******************************************************************************
 Dependent variable is DLRYTUR
 List of the variables added to the regression:
 LTBTUR(-1)      LRYTUR(-1)      LRYWORLD(-1)    LREER9(-1)
 39 observations used for estimation from 1962 to 2000
*******************************************************************************
 Regressor              Coefficient       Standard Error         T-Ratio[Prob]
 INPT                      .46002             .23536              1.9545[.060]
 DLRYTUR(-1)              -.14781             .18476             -.79997[.430]
 DLTBTUR(-1)               .020872            .038930             .53614[.596]
 DLWORLD(-1)              -.26918             .20363             -1.3219[.196]
 DLREER9(-1)              -.062405            .062131            -1.0044[.323]
 LTBTUR(-1)                .0027725           .046063            .060188[.952]
 LRYTUR(-1)               -.15389             .097806            -1.5734[.126]
 LRYWORLD(-1)              .15982             .15185              1.0525[.301]
 LREER9(-1)                .095709            .055291             1.7310[.094]
*******************************************************************************
 Joint test of zero restrictions on the coefficients of additional variables:
 Lagrange Multiplier Statistic     CHSQ( 4)=  10.7370[.030]
 Likelihood Ratio Statistic        CHSQ( 4)=  12.5582[.014]
 F Statistic                    F(  4,  30)=   2.8492[.041]
*******************************************************************************
```

F-test Aggregate

```
                      Variable Addition Test (OLS case)
*******************************************************************************
 Dependent variable is DLWORLD
 List of the variables added to the regression:
 LTBTUR(-1)      LRYTUR(-1)      LRYWORLD(-1)    LREER9(-1)
 39 observations used for estimation from 1962 to 2000
*******************************************************************************
 Regressor              Coefficient       Standard Error         T-Ratio[Prob]
 INPT                      -.37538            .19776            -1.8981[.067]
 DLRYTUR(-1)              -.062362            .15525            -.40169[.691]
 DLTBTUR(-1)              -.023195           .032711            -.70908[.484]
 DLWORLD(-1)                .20687            .17110             1.2090[.236]
 DLREER9(-1)              -.023640           .052206            -.45282[.654]
 LTBTUR(-1)                .011874           .038705             .30679[.761]
 LRYTUR(-1)                 .17543           .082182             2.1347[.041]
 LRYWORLD(-1)              -.35739            .12759            -2.8011[.009]
 LREER9(-1)               .0041741           .046458            .089846[.929]
*******************************************************************************
 Joint test of zero restrictions on the coefficients of additional variables:
 Lagrange Multiplier Statistic     CHSQ( 4)=  11.8054[.019]
 Likelihood Ratio Statistic        CHSQ( 4)=  14.0611[.007]
 F Statistic                    F(  4,  30)=   3.2558[.025]
*******************************************************************************
                     Variable Addition Test (OLS case)
*******************************************************************************
 Dependent variable is DLREER9
 List of the variables added to the regression:
 LTBTUR(-1)      LRYTUR(-1)      LRYWORLD(-1)    LREER9(-1)
 39 observations used for estimation from 1962 to 2000
*******************************************************************************
 Regressor              Coefficient       Standard Error         T-Ratio[Prob]
 INPT                      -.67969            .85842            -.79179[.435]
 DLRYTUR(-1)               .087859            .67388             .13038[.897]
 DLTBTUR(-1)                .10233            .14199             .72073[.477]
 DLWORLD(-1)              -.012714            .74268           -.017119[.986]
 DLREER9(-1)                .21315            .22661             .94063[.354]
 LTBTUR(-1)                -.14865            .16800            -.88479[.383]
 LRYTUR(-1)                 .49518            .35672             1.3881[.175]
 LRYWORLD(-1)              -.51747            .55382            -.93438[.358]
 LREER9(-1)                -.39104            .20166            -1.9391[.062]
*******************************************************************************
 Joint test of zero restrictions on the coefficients of additional variables:
 Lagrange Multiplier Statistic     CHSQ( 4)=   6.2203[.183]
 Likelihood Ratio Statistic        CHSQ( 4)=   6.7763[.148]
 F Statistic                    F(  4,  30)=   1.4232[.250]
******************************************************************************
```

Austria's ARDL

```
   Error Correction Representation for the Selected ARDL Model
         ARDL(1,0,0,0) selected based on Akaike Information Criterion
*******************************************************************************
 Dependent variable is dLTBAVUS
 39 observations used for estimation from 1962 to 2000
*******************************************************************************
 Regressor              Coefficient       Standard Error         T-Ratio[Prob]
 dLRYTUR                   -.10821            .74357            -.14553[.885]
 dLRYAVUS                  -.23812            .76596            -.31087[.758]
 dLRERAVUS                .0084486           .017658             .47846[.635]
 dINPT                      2.4494            5.2740             .46442[.645]
 ecm(-1)                   -.50871            .14921            -3.4094[.002]
*******************************************************************************
 List of additional temporary variables created:
 dLTBAVUS = LTBAVUS-LTBAVUS(-1)
 dLRYTUR = LRYTUR-LRYTUR(-1)
 dLRYAVUS = LRYAVUS-LRYAVUS(-1)
 dLRERAVUS = LRERAVUS-LRERAVUS(-1)
 dINPT = INPT-INPT(-1)
 ecm = LTBAVUS +   .21271*LRYTUR +   .46807*LRYAVUS  -.016608*LRERAVUS   -4.81
48*INPT
*******************************************************************************
 R-Squared                     .26300   R-Bar-Squared                   .17630
 S.E. of Regression            .28052   F-stat.    F(  4,  34)    3.0333[.031]
 Mean of Dependent Variable  .3710E-3   S.D. of Dependent Variable      .30909
 Residual Sum of Squares       2.6756   Equation Log-likelihood        -3.0903
 Akaike Info. Criterion       -8.0903   Schwarz Bayesian Criterion    -12.2492
 DW-statistic                  1.8035
*******************************************************************************
 R-Squared and R-Bar-Squared measures refer to the dependent variable
 dLTBAVUS and in cases where the error correction model is highly
 restricted, these measures could become negative.

           Estimated Long Run Coefficients using the ARDL Approach
         ARDL(1,0,0,0) selected based on Akaike Information Criterion
*******************************************************************************
 Dependent variable is LTBAVUS
 39 observations used for estimation from 1962 to 2000
*******************************************************************************
 Regressor              Coefficient       Standard Error         T-Ratio[Prob]
 LRYTUR                    -.21271            1.4534            -.14636[.885]
 LRYAVUS                   -.46807            1.5216            -.30762[.760]
 LRERAVUS                  .016608           .034702             .47858[.635]
 INPT                       4.8148           10.1679             .47353[.639]
*******************************************************************************
```

Austria's ARDL

```
       Error Correction Representation for the Selected ARDL Model
                          ARDL(2,5)[2] selected
*******************************************************************************
 Dependent variable is dLTBAVUS
 36 observations used for estimation from 1965 to 2000
*******************************************************************************
 Regressor              Coefficient       Standard Error         T-Ratio[Prob]
 dLTBAVUS1                 .014947             .18502            .080788[.936]
 dLRERAVUS               -.044132             .16830            -.26223[.795]
 dLRERAVUS1               -.25683             .19468            -1.3192[.198]
 dLRERAVUS2               .056503             .20451             .27628[.784]
 dLRERAVUS3               -.11251             .20400            -.55150[.586]
 dLRERAVUS4              -.090367             .19621            -.46057[.649]
 dINPT                     .53994             .25929             2.0823[.047]
 ecm(-1)                  -.55244             .18932            -2.9180[.007]
*******************************************************************************
 List of additional temporary variables created:
 dLTBAVUS = LTBAVUS-LTBAVUS(-1)
 dLTBAVUS1 = LTBAVUS(-1)-LTBAVUS(-2)
 dLRERAVUS = LRERAVUS-LRERAVUS(-1)
 dLRERAVUS1 = LRERAVUS(-1)-LRERAVUS(-2)
 dLRERAVUS2 = LRERAVUS(-2)-LRERAVUS(-3)
 dLRERAVUS3 = LRERAVUS(-3)-LRERAVUS(-4)
 dLRERAVUS4 = LRERAVUS(-4)-LRERAVUS(-5)
 dINPT = INPT-INPT(-1)
 ecm = LTBAVUS  -.028978*LRERAVUS   -.97738*INPT
*******************************************************************************
 R-Squared                      .33091   R-Bar-Squared                   .13266
 S.E. of Regression             .27916   F-stat.    F(  7,  28)    1.9076[.106]
 Mean of Dependent Variable  -.011709   S.D. of Dependent Variable      .29975
 Residual Sum of Squares        2.1040   Equation Log-likelihood        .032027
 Akaike Info. Criterion        -8.9680   Schwarz Bayesian Criterion    -16.0938
 DW-statistic                   1.9791
*******************************************************************************
 R-Squared and R-Bar-Squared measures refer to the dependent variable
 dLTBAVUS and in cases where the error correction model is highly
 restricted, these measures could become negative.
```

[2] We choose (2, 5) lags for LTBAVUS and LRERAVUS respectively because they produce the best significant ecm

Belgium's ARDL

```
   Error Correction Representation for the Selected ARDL Model
         ARDL(0,0,1,0) selected based on Akaike Information Criterion
*******************************************************************************
 Dependent variable is dLTBL
 39 observations used for estimation from 1962 to 2000
*******************************************************************************
 Regressor              Coefficient       Standard Error         T-Ratio[Prob]
 dLRYTUR                    .51298             .89986              .57007[.572]
 dLRYBL                    -2.3482             1.4604             -1.6080[.117]
 dLRERBL                  -.044500            .025813             -1.7239[.094]
 dINPT                    -12.1760             4.9242             -2.4727[.019]
 ecm(-1)                   -1.0000               0.00              *NONE*
*******************************************************************************
 List of additional temporary variables created:
 dLTBL = LTBL-LTBL(-1)
 dLRYTUR = LRYTUR-LRYTUR(-1)
 dLRYBL = LRYBL-LRYBL(-1)
 dLRERBL = LRERBL-LRERBL(-1)
 dINPT = INPT-INPT(-1)
 ecm = LTBL   -.51298*LRYTUR   -1.5712*LRYBL +  .044500*LRERBL +  12.1760*INPT
*******************************************************************************
 R-Squared                      .55238   R-Bar-Squared                   .49971
 S.E. of Regression             .30229   F-stat.    F(  4,  34)   10.4892[.000]
 Mean of Dependent Variable   .025140   S.D. of Dependent Variable      .42738
 Residual Sum of Squares        3.1069   Equation Log-likelihood        -6.0049
 Akaike Info. Criterion       -11.0049   Schwarz Bayesian Criterion    -15.1638
 DW-statistic                   1.6050
*******************************************************************************
 R-Squared and R-Bar-Squared measures refer to the dependent variable
 dLTBL and in cases where the error correction model is highly
 restricted, these measures could become negative.

           Estimated Long Run Coefficients using the ARDL Approach
         ARDL(0,0,1,0) selected based on Akaike Information Criterion
*******************************************************************************
 Dependent variable is LTBL
 39 observations used for estimation from 1962 to 2000
*******************************************************************************
 Regressor              Coefficient       Standard Error         T-Ratio[Prob]
 LRYTUR                     .51298             .89986              .57007[.572]
 LRYBL                      1.5712             1.2775              1.2299[.227]
 LRERBL                   -.044500            .025813             -1.7239[.094]
 INPT                     -12.1760             4.9242             -2.4727[.019]
*******************************************************************************
```

Belgium's ARDL

```
         Error Correction Representation for the Selected ARDL Model
                           ARDL(1,5)[3] selected
*******************************************************************************
 Dependent variable is dLTBL
 36 observations used for estimation from 1965 to 2000
*******************************************************************************
 Regressor              Coefficient       Standard Error         T-Ratio[Prob]
 dLRERBL                    .13307             .23275              .57173[.572]
 dLRERBL1                  .082487             .26801              .30778[.760]
 dLRERBL2                   .31963             .27161              1.1768[.249]
 dLRERBL3                 -.081959             .27887            -.29389[.771]
 dLRERBL4                 -.030453             .26806            -.11360[.910]
 dINPT                    -.073475             .32588            -.22546[.823]
 ecm(-1)                   -.53464             .16824            -3.1778[.004]
*******************************************************************************
 List of additional temporary variables created:
 dLTBL = LTBL-LTBL(-1)
 dLRERBL = LRERBL-LRERBL(-1)
 dLRERBL1 = LRERBL(-1)-LRERBL(-2)
 dLRERBL2 = LRERBL(-2)-LRERBL(-3)
 dLRERBL3 = LRERBL(-3)-LRERBL(-4)
 dLRERBL4 = LRERBL(-4)-LRERBL(-5)
 dINPT = INPT-INPT(-1)
 ecm = LTBL +  .016807*LRERBL +   .13743*INPT
*******************************************************************************
 R-Squared                     .30703   R-Bar-Squared                    .13379
 S.E. of Regression            .40036   F-stat.    F(  6,  29)    2.0676[.088]
 Mean of Dependent Variable   .027464   S.D. of Dependent Variable      .43017
 Residual Sum of Squares       4.4880   Equation Log-likelihood       -13.6038
 Akaike Info. Criterion      -21.6038   Schwarz Bayesian Criterion    -27.9379
 DW-statistic                  2.3766
*******************************************************************************
 R-Squared and R-Bar-Squared measures refer to the dependent variable
 dLTBL and in cases where the error correction model is highly
 restricted, these measures could become negative.
```

[3] We choose (1, 5) lags for LTBL and LRERBL respectively because they produce the best significant ecm

England's ARDL

```
         Error Correction Representation for the Selected ARDL Model
        ARDL(1,2,2,0) selected based on Akaike Information Criterion
*******************************************************************************
 Dependent variable is dLTBENG
 39 observations used for estimation from 1962 to 2000
*******************************************************************************
 Regressor              Coefficient       Standard Error         T-Ratio[Prob]
 dLRYTUR                    2.0460              .93971             2.1773[.037]
 dLRYTUR1                   1.5212              .92467             1.6451[.110]
 dLRYENG                   -1.6841              1.3922            -1.2097[.235]
 dLRYENG1                  -2.6358              1.3046            -2.0204[.052]
 dLRERENG                  .012674             .011917             1.0636[.295]
 dINPT                      4.4460              2.4632             1.8050[.080]
 ecm(-1)                   -.38453              .13031            -2.9510[.006]
*******************************************************************************
 List of additional temporary variables created:
 dLTBENG = LTBENG-LTBENG(-1)
 dLRYTUR = LRYTUR-LRYTUR(-1)
 dLRYTUR1 = LRYTUR(-1)-LRYTUR(-2)
 dLRYENG = LRYENG-LRYENG(-1)
 dLRYENG1 = LRYENG(-1)-LRYENG(-2)
 dLRERENG = LRERENG-LRERENG(-1)
 dINPT = INPT-INPT(-1)
 ecm = LTBENG +   2.5164*LRYTUR   -3.8623*LRYENG  -.032961*LRERENG  -11.5621*I
NPT
*******************************************************************************
 R-Squared                      .55302   R-Bar-Squared                   .43382
 S.E. of Regression             .19564   F-stat.    F(  6,  32)    6.1861[.000]
 Mean of Dependent Variable  -.041266   S.D. of Dependent Variable      .26000
 Residual Sum of Squares        1.1482   Equation Log-likelihood        13.4061
 Akaike Info. Criterion         4.4061   Schwarz Bayesian Criterion     -3.0800
 DW-statistic                   2.3646
*******************************************************************************
 R-Squared and R-Bar-Squared measures refer to the dependent variable
 dLTBENG and in cases where the error correction model is highly
 restricted, these measures could become negative.
```

England's ARDL

```
           Estimated Long Run Coefficients using the ARDL Approach
        ARDL(1,2,2,0) selected based on Akaike Information Criterion
*******************************************************************************
 Dependent variable is LTBENG
 39 observations used for estimation from 1962 to 2000
*******************************************************************************
 Regressor              Coefficient       Standard Error         T-Ratio[Prob]
 LRYTUR                     -2.5164               1.7348           -1.4505[.157]
 LRYENG                      3.8623               4.2946            .89935[.376]
 LRERENG                    .032961              .030760            1.0716[.292]
 INPT                       11.5621               4.4113            2.6210[.014]
*******************************************************************************
         Error Correction Representation for the Selected ARDL Model
                             ARDL(2,5) selected
*******************************************************************************
 Dependent variable is dLTBENG
 36 observations used for estimation from 1965 to 2000
*******************************************************************************
 Regressor              Coefficient       Standard Error         T-Ratio[Prob]
 dLTBENG1                   .055748               .17922            .31106[.758]
 dLRERENG                   -.33071               .12811           -2.5815[.015]
 dLRERENG1                -.0055184               .14851         -.037158[.971]
 dLRERENG2                   .23129               .14876            1.5547[.131]
 dLRERENG3                 -.024537               .15265           -.16074[.873]
 dLRERENG4                  -.28362               .14180           -2.0002[.055]
 dINPT                       .75497               .31224            2.4179[.022]
 ecm(-1)                    -.44462               .16530           -2.6898[.012]
*******************************************************************************
 List of additional temporary variables created:
 dLTBENG = LTBENG-LTBENG(-1)
 dLTBENG1 = LTBENG(-1)-LTBENG(-2)
 dLRERENG = LRERENG-LRERENG(-1)
 dLRERENG1 = LRERENG(-1)-LRERENG(-2)
 dLRERENG2 = LRERENG(-2)-LRERENG(-3)
 dLRERENG3 = LRERENG(-3)-LRERENG(-4)
 dLRERENG4 = LRERENG(-4)-LRERENG(-5)
 dINPT = INPT-INPT(-1)
 ecm = LTBENG -.0093993*LRERENG   -1.6980*INPT
*******************************************************************************
 R-Squared                     .43775   R-Bar-Squared                    .27116
 S.E. of Regression            .22762   F-stat.    F(  7,  28)    3.0031[.018]
 Mean of Dependent Variable  -.033908   S.D. of Dependent Variable       .26662
 Residual Sum of Squares       1.3989   Equation Log-likelihood          7.3797
 Akaike Info. Criterion       -1.6203   Schwarz Bayesian Criterion      -8.7461
 DW-statistic                  2.0596
*******************************************************************************
```

```
R-Squared and R-Bar-Squared measures refer to the dependent variable
```

France's ARDL

```
         Error Correction Representation for the Selected ARDL Model
        ARDL(1,0,1,0) selected based on Akaike Information Criterion
*******************************************************************************
 Dependent variable is dLTBFRA
 39 observations used for estimation from 1962 to 2000
*******************************************************************************
 Regressor              Coefficient       Standard Error         T-Ratio[Prob]
 dLRYTUR                    .57045            .86229              .66155[.513]
 dLRYFRA                   -3.2945            1.7171             -1.9187[.063]
 dLRERFRA                 -.021808           .030951             -.70461[.486]
 dINPT                     -3.4047            5.4401             -.62586[.536]
 ecm(-1)                   -.50669            .14631             -3.4631[.001]
*******************************************************************************
 List of additional temporary variables created:
 dLTBFRA = LTBFRA-LTBFRA(-1)
 dLRYTUR = LRYTUR-LRYTUR(-1)
 dLRYFRA = LRYFRA-LRYFRA(-1)
 dLRERFRA = LRERFRA-LRERFRA(-1)
 dINPT = INPT-INPT(-1)
 ecm = LTBFRA   -1.1258*LRYTUR +   1.1046*LRYFRA +  .043040*LRERFRA +   6.7195
*INPT
*******************************************************************************
 R-Squared                     .37057   R-Bar-Squared                   .27520
 S.E. of Regression            .33221   F-stat.    F(  4,  34)    4.8571[.003]
 Mean of Dependent Variable   .023102   S.D. of Dependent Variable      .39021
 Residual Sum of Squares       3.6420   Equation Log-likelihood        -9.1035
 Akaike Info. Criterion      -15.1035   Schwarz Bayesian Criterion    -20.0942
 DW-statistic                  1.6348
*******************************************************************************
 R-Squared and R-Bar-Squared measures refer to the dependent variable
 dLTBFRA and in cases where the error correction model is highly
 restricted, these measures could become negative.

           Estimated Long Run Coefficients using the ARDL Approach
        ARDL(1,0,1,0) selected based on Akaike Information Criterion
*******************************************************************************
 Dependent variable is LTBFRA
 39 observations used for estimation from 1962 to 2000
*******************************************************************************
 Regressor              Coefficient       Standard Error         T-Ratio[Prob]
 LRYTUR                     1.1258            1.7109              .65804[.515]
 LRYFRA                    -1.1046            2.1280             -.51906[.607]
 LRERFRA                  -.043040           .060420             -.71235[.481]
 INPT                      -6.7195           10.5335             -.63792[.528]
*******************************************************************************
```

France's ARDL

```
         Error Correction Representation for the Selected ARDL Model
                              ARDL(1,5) selected
*******************************************************************************
 Dependent variable is dLTBFRA
 36 observations used for estimation from 1965 to 2000
*******************************************************************************
 Regressor              Coefficient       Standard Error         T-Ratio[Prob]
 dLRERFRA                 -.023602            .18225            -.12950[.898]
 dLRERFRA1                 .077220            .20967             .36830[.715]
 dLRERFRA2                -.016593            .21514           -.077124[.939]
 dLRERFRA3                 -.26226            .21545            -1.2173[.233]
 dLRERFRA4                .0022346            .21690            .010303[.992]
 dINPT                      .35632            .22304             1.5975[.121]
 ecm(-1)                   -.36464            .13669            -2.6676[.012]
*******************************************************************************
 List of additional temporary variables created:
 dLTBFRA = LTBFRA-LTBFRA(-1)
 dLRERFRA = LRERFRA-LRERFRA(-1)
 dLRERFRA1 = LRERFRA(-1)-LRERFRA(-2)
 dLRERFRA2 = LRERFRA(-2)-LRERFRA(-3)
 dLRERFRA3 = LRERFRA(-3)-LRERFRA(-4)
 dLRERFRA4 = LRERFRA(-4)-LRERFRA(-5)
 dINPT = INPT-INPT(-1)
 ecm = LTBFRA  -.039093*LRERFRA   -.97720*INPT
*******************************************************************************
 R-Squared                     .25841   R-Bar-Squared                  .073007
 S.E. of Regression            .32030   F-stat.    F(  6,  29)    1.6261[.176]
 Mean of Dependent Variable   .021828   S.D. of Dependent Variable      .33267
 Residual Sum of Squares       2.8726   Equation Log-likelihood        -5.5722
 Akaike Info. Criterion      -13.5722   Schwarz Bayesian Criterion    -19.9063
 DW-statistic                  2.1836
*******************************************************************************
 R-Squared and R-Bar-Squared measures refer to the dependent variable
 dLTBFRA and in cases where the error correction model is highly
 restricted, these measures could become negative.
```

Germany's ARDL

```
         Error Correction Representation for the Selected ARDL Model
        ARDL(1,1,1,0) selected based on Akaike Information Criterion
*******************************************************************************
 Dependent variable is dLTBGER
 39 observations used for estimation from 1962 to 2000
*******************************************************************************
 Regressor              Coefficient       Standard Error         T-Ratio[Prob]
 dLRYTUR                    1.4564            .73185              1.9900[.055]
 dLRYGER                   -1.8513            .79795             -2.3200[.026]
 dLRERGER                 .0083258           .016916              .49217[.626]
 dINPT                      2.3330            2.7587              .84571[.404]
 ecm(-1)                   -.21323            .11826             -1.8031[.080]
*******************************************************************************
 List of additional temporary variables created:
 dLTBGER = LTBGER-LTBGER(-1)
 dLRYTUR = LRYTUR-LRYTUR(-1)
 dLRYGER = LRYGER-LRYGER(-1)
 dLRERGER = LRERGER-LRERGER(-1)
 dINPT = INPT-INPT(-1)
 ecm = LTBGER +   2.0908*LRYTUR   -2.7378*LRYGER  -.039047*LRERGER  -10.9415*I
NPT
*******************************************************************************
 R-Squared                     .43435   R-Bar-Squared                   .32829
 S.E. of Regression            .16442   F-stat.    F(  4,  34)    6.1430[.001]
 Mean of Dependent Variable -.0098097   S.D. of Dependent Variable      .20061
 Residual Sum of Squares       .86506   Equation Log-likelihood        18.9275
 Akaike Info. Criterion       11.9275   Schwarz Bayesian Criterion      6.1051
 DW-statistic                  2.2062
*******************************************************************************
 R-Squared and R-Bar-Squared measures refer to the dependent variable
 dLTBGER and in cases where the error correction model is highly
 restricted, these measures could become negative.

           Estimated Long Run Coefficients using the ARDL Approach
        ARDL(1,1,1,0) selected based on Akaike Information Criterion
*******************************************************************************
 Dependent variable is LTBGER
 39 observations used for estimation from 1962 to 2000
*******************************************************************************
 Regressor              Coefficient       Standard Error         T-Ratio[Prob]
 LRYTUR                    -2.0908            3.0127             -.69399[.493]
 LRYGER                     2.7378            4.0232              .68050[.501]
 LRERGER                   .039047           .092450              .42235[.676]
 INPT                      10.9415           16.3355              .66980[.508]
*******************************************************************************
```

Germany's ARDL

```
         Error Correction Representation for the Selected ARDL Model
                             ARDL(1,5) selected
*******************************************************************************
 Dependent variable is dLTBGER
 36 observations used for estimation from 1965 to 2000
*******************************************************************************
 Regressor              Coefficient       Standard Error         T-Ratio[Prob]
 dLRERGER                  -.22579             .11269            -2.0036[.055]
 dLRERGER1                 .077975             .13270             .58763[.561]
 dLRERGER2                  .15611             .13288             1.1748[.250]
 dLRERGER3                -.072155             .13352            -.54041[.593]
 dLRERGER4                 -.18213             .13061            -1.3944[.174]
 dINPT                      .23639             .13446             1.7581[.089]
 ecm(-1)                   -.30214             .12508            -2.4156[.022]
*******************************************************************************
 List of additional temporary variables created:
 dLTBGER = LTBGER-LTBGER(-1)
 dLRERGER = LRERGER-LRERGER(-1)
 dLRERGER1 = LRERGER(-1)-LRERGER(-2)
 dLRERGER2 = LRERGER(-2)-LRERGER(-3)
 dLRERGER3 = LRERGER(-3)-LRERGER(-4)
 dLRERGER4 = LRERGER(-4)-LRERGER(-5)
 dINPT = INPT-INPT(-1)
 ecm = LTBGER  -.014500*LRERGER   -.78239*INPT
*******************************************************************************
 R-Squared                    .32890   R-Bar-Squared                    .16113
 S.E. of Regression           .18680   F-stat.    F(  6,  29)    2.2871[.063]
 Mean of Dependent Variable -.0036971   S.D. of Dependent Variable      .20395
 Residual Sum of Squares      .97701   Equation Log-likelihood        13.8403
 Akaike Info. Criterion       5.8403   Schwarz Bayesian Criterion     -.49382
 DW-statistic                 2.1458
*******************************************************************************
 R-Squared and R-Bar-Squared measures refer to the dependent variable
 dLTBGER and in cases where the error correction model is highly
 restricted, these measures could become negative.
```

Holland's ARDL

```
         Error Correction Representation for the Selected ARDL Model
        ARDL(1,0,2,0) selected based on Akaike Information Criterion
*******************************************************************************
 Dependent variable is dLTBHOL
 39 observations used for estimation from 1962 to 2000
*******************************************************************************
 Regressor             Coefficient       Standard Error         T-Ratio[Prob]
 dLRYTUR                  -.76235             .92259            -.82631[.415]
 dLRYHOL                  .046418             1.3639            .034033[.973]
 dLRYHOL1                  1.8407             1.3379             1.3758[.178]
 dLRERHOL                -.013381            .027603            -.48477[.631]
 dINPT                   -.010474             6.4435          -.0016255[.999]
 ecm(-1)                  -.57294             .15165            -3.7781[.001]
*******************************************************************************
 List of additional temporary variables created:
 dLTBHOL = LTBHOL-LTBHOL(-1)
 dLRYTUR = LRYTUR-LRYTUR(-1)
 dLRYHOL = LRYHOL-LRYHOL(-1)
 dLRYHOL1 = LRYHOL(-1)-LRYHOL(-2)
 dLRERHOL = LRERHOL-LRERHOL(-1)
 dINPT = INPT-INPT(-1)
 ecm = LTBHOL +   1.3306*LRYTUR   -3.3325*LRYHOL +  .023355*LRERHOL +  .018281
*INPT
*******************************************************************************
 R-Squared                     .43802   R-Bar-Squared                   .33265
 S.E. of Regression            .25272   F-stat.    F(  5,  33)    4.9884[.002]
 Mean of Dependent Variable   .013112   S.D. of Dependent Variable      .30936
 Residual Sum of Squares       2.0437   Equation Log-likelihood         2.1629
 Akaike Info. Criterion       -4.8371   Schwarz Bayesian Criterion    -10.6595
 DW-statistic                  2.1423
*******************************************************************************
 R-Squared and R-Bar-Squared measures refer to the dependent variable
 dLTBHOL and in cases where the error correction model is highly
 restricted, these measures could become negative.
           Estimated Long Run Coefficients using the ARDL Approach
        ARDL(1,0,2,0) selected based on Akaike Information Criterion
*******************************************************************************
 Dependent variable is LTBHOL
 39 observations used for estimation from 1962 to 2000
*******************************************************************************
 Regressor             Coefficient       Standard Error         T-Ratio[Prob]
 LRYTUR                   -1.3306             1.5831            -.84049[.407]
 LRYHOL                    3.3325             1.5228             2.1884[.036]
 LRERHOL                 -.023355            .047962            -.48695[.630]
 INPT                    -.018281            11.2465          -.0016255[.999]
*******************************************************************************
```

Holland's ARDL

```
         Error Correction Representation for the Selected ARDL Model
                           ARDL(1,5) selected
*******************************************************************************
 Dependent variable is dLTBHOL
 36 observations used for estimation from 1965 to 2000
*******************************************************************************
 Regressor              Coefficient       Standard Error         T-Ratio[Prob]
 dLRERHOL                   .15340            .17663              .86846[.392]
 dLRERHOL1               -.031665             .20621             -.15356[.879]
 dLRERHOL2                  .18194            .20910              .87014[.391]
 dLRERHOL3                 -.24925            .21166             -1.1776[.249]
 dLRERHOL4                 .035183            .20424              .17226[.864]
 dINPT                     -.11167            .20539             -.54369[.591]
 ecm(-1)                   -.33488            .12670             -2.6432[.013]
*******************************************************************************
 List of additional temporary variables created:
 dLTBHOL = LTBHOL-LTBHOL(-1)
 dLRERHOL = LRERHOL-LRERHOL(-1)
 dLRERHOL1 = LRERHOL(-1)-LRERHOL(-2)
 dLRERHOL2 = LRERHOL(-2)-LRERHOL(-3)
 dLRERHOL3 = LRERHOL(-3)-LRERHOL(-4)
 dLRERHOL4 = LRERHOL(-4)-LRERHOL(-5)
 dINPT = INPT-INPT(-1)
 ecm = LTBHOL +  .021080*LRERHOL +   .33345*INPT
*******************************************************************************
 R-Squared                     .29490   R-Bar-Squared                   .11863
 S.E. of Regression            .29934   F-stat.    F(  6,  29)    1.9518[.106]
 Mean of Dependent Variable   .023253   S.D. of Dependent Variable      .31885
 Residual Sum of Squares       2.5089   Equation Log-likelihood        -3.1355
 Akaike Info. Criterion      -11.1355   Schwarz Bayesian Criterion    -17.4696
 DW-statistic                  2.3815
*******************************************************************************
 R-Squared and R-Bar-Squared measures refer to the dependent variable
 dLTBHOL and in cases where the error correction model is highly
 restricted, these measures could become negative.
```

Italy's ARDL

```
         Error Correction Representation for the Selected ARDL Model
        ARDL(2,1,1,0) selected based on Akaike Information Criterion
*******************************************************************************
 Dependent variable is dLTBITA
 39 observations used for estimation from 1962 to 2000
*******************************************************************************
 Regressor              Coefficient       Standard Error         T-Ratio[Prob]
 dLTBITA1                  -.37929            .15664              -2.4214[.021]
 dLRYTUR                    3.0553            1.2514               2.4416[.020]
 dLRYITA                   -4.3227            1.4599              -2.9609[.006]
 dLRERITA                 .0032370           .028672               .11290[.911]
 dINPT                      .55822            5.8310              .095733[.924]
 ecm(-1)                   -.16280            .13911              -1.1703[.250]
*******************************************************************************
 List of additional temporary variables created:
 dLTBITA = LTBITA-LTBITA(-1)
 dLTBITA1 = LTBITA(-1)-LTBITA(-2)
 dLRYTUR = LRYTUR-LRYTUR(-1)
 dLRYITA = LRYITA-LRYITA(-1)
 dLRERITA = LRERITA-LRERITA(-1)
 dINPT = INPT-INPT(-1)
 ecm = LTBITA   -.38346*LRYTUR +   1.6298*LRYITA  -.019884*LRERITA   -3.4290*I
NPT
*******************************************************************************
 R-Squared                     .50616   R-Bar-Squared                    .39464
 S.E. of Regression            .28299   F-stat.    F(  5,  33)    6.3545[.000]
 Mean of Dependent Variable   .012274   S.D. of Dependent Variable      .36371
 Residual Sum of Squares       2.4825   Equation Log-likelihood        -1.6299
 Akaike Info. Criterion       -9.6299   Schwarz Bayesian Criterion    -16.2842
 DW-statistic                  1.6738
*******************************************************************************
 R-Squared and R-Bar-Squared measures refer to the dependent variable
 dLTBITA and in cases where the error correction model is highly
 restricted, these measures could become negative.
           Estimated Long Run Coefficients using the ARDL Approach
        ARDL(2,1,1,0) selected based on Akaike Information Criterion
*******************************************************************************
 Dependent variable is LTBITA
 39 observations used for estimation from 1962 to 2000
*******************************************************************************
 Regressor              Coefficient       Standard Error         T-Ratio[Prob]
 LRYTUR                     .38346            5.6101              .068352[.946]
 LRYITA                    -1.6298            6.7012              -.24322[.809]
 LRERITA                   .019884            .17815               .11161[.912]
 INPT                       3.4290           36.1899              .094749[.925]
*******************************************************************************
```

Italy's ARDL

```
         Error Correction Representation for the Selected ARDL Model
                           ARDL(1,5) selected
******************************************************************************
 Dependent variable is dLTBITA
 36 observations used for estimation from 1965 to 2000
******************************************************************************
 Regressor              Coefficient       Standard Error         T-Ratio[Prob]
 dLRERITA                 -.28433             .17760             -1.6010[.120]
 dLRERITA1              -.0042455             .21273            -.019957[.984]
 dLRERITA2                .083197             .21239              .39171[.698]
 dLRERITA3                -.36866             .20951             -1.7597[.089]
 dLRERITA4               -.037031             .22325             -.16587[.869]
 dINPT                     .67875             .28428              2.3876[.024]
 ecm(-1)                  -.50942             .15832             -3.2175[.003]
******************************************************************************
 List of additional temporary variables created:
 dLTBITA = LTBITA-LTBITA(-1)
 dLRERITA = LRERITA-LRERITA(-1)
 dLRERITA1 = LRERITA(-1)-LRERITA(-2)
 dLRERITA2 = LRERITA(-2)-LRERITA(-3)
 dLRERITA3 = LRERITA(-3)-LRERITA(-4)
 dLRERITA4 = LRERITA(-4)-LRERITA(-5)
 dINPT = INPT-INPT(-1)
 ecm = LTBITA  -.081034*LRERITA   -1.3324*INPT
******************************************************************************
 R-Squared                    .38489   R-Bar-Squared                   .23112
 S.E. of Regression           .31210   F-stat.    F(  6,  29)    2.9201[.024]
 Mean of Dependent Variable  .016536   S.D. of Dependent Variable      .35592
 Residual Sum of Squares      2.7273   Equation Log-likelihood        -4.6381
 Akaike Info. Criterion     -12.6381   Schwarz Bayesian Criterion    -18.9722
 DW-statistic                 2.1559
******************************************************************************
 R-Squared and R-Bar-Squared measures refer to the dependent variable
 dLTBITA and in cases where the error correction model is highly
 restricted, these measures could become negative.
```

Switzerland's ARDL

```
         Error Correction Representation for the Selected ARDL Model
        ARDL(1,0,0,0) selected based on Akaike Information Criterion
*******************************************************************************
 Dependent variable is dLTBSWIS
 39 observations used for estimation from 1962 to 2000
*******************************************************************************
 Regressor              Coefficient       Standard Error         T-Ratio[Prob]
 dLRYTUR                    .18760            .61868              .30322[.764]
 dLRYSWIS                   1.1512            .88849              1.2956[.204]
 dLRERSWIS                -.015564           .021303            -.73060[.470]
 dINPT                     -6.8328            4.4083            -1.5500[.130]
 ecm(-1)                   -.48585            .14023            -3.4647[.001]
*******************************************************************************
 List of additional temporary variables created:
 dLTBSWIS = LTBSWIS-LTBSWIS(-1)
 dLRYTUR = LRYTUR-LRYTUR(-1)
 dLRYSWIS = LRYSWIS-LRYSWIS(-1)
 dLRERSWIS = LRERSWIS-LRERSWIS(-1)
 dINPT = INPT-INPT(-1)
 ecm = LTBSWIS   -.38612*LRYTUR   -2.3694*LRYSWIS +  .032034*LRERSWIS +  14.06
35*INPT
*******************************************************************************
 R-Squared                     .28873   R-Bar-Squared                   .20506
 S.E. of Regression            .33649   F-stat.    F(  4,  34)    3.4505[.018]
 Mean of Dependent Variable   .048317   S.D. of Dependent Variable      .37741
 Residual Sum of Squares       3.8498   Equation Log-likelihood       -10.1854
 Akaike Info. Criterion      -15.1854   Schwarz Bayesian Criterion    -19.3443
 DW-statistic                  1.9341
*******************************************************************************
 R-Squared and R-Bar-Squared measures refer to the dependent variable
 dLTBSWIS and in cases where the error correction model is highly
 restricted, these measures could become negative.

           Estimated Long Run Coefficients using the ARDL Approach
        ARDL(1,0,0,0) selected based on Akaike Information Criterion
*******************************************************************************
 Dependent variable is LTBSWIS
 39 observations used for estimation from 1962 to 2000
*******************************************************************************
 Regressor              Coefficient       Standard Error         T-Ratio[Prob]
 LRYTUR                     .38612            1.2358              .31243[.757]
 LRYSWIS                    2.3694            1.9540              1.2126[.234]
 LRERSWIS                 -.032034           .042396            -.75559[.455]
 INPT                     -14.0635            7.5792            -1.8555[.072]
*******************************************************************************
```

Switzerland's ARDL

```
         Error Correction Representation for the Selected ARDL Model
                           ARDL(1,5) selected
*******************************************************************************
 Dependent variable is dLTBSWIS
 36 observations used for estimation from 1965 to 2000
*******************************************************************************
 Regressor              Coefficient       Standard Error         T-Ratio[Prob]
 dLRERSWIS                 .088722              .20815             .42624[.673]
 dLRERSWIS1                 .28373              .23086             1.2290[.229]
 dLRERSWIS2                -.23416              .24087            -.97214[.339]
 dLRERSWIS3                -.26345              .23526            -1.1198[.272]
 dLRERSWIS4                -.16101              .23478            -.68579[.498]
 dINPT                      .43856              .21074             2.0810[.046]
 ecm(-1)                   -.48458              .14569            -3.3262[.002]
*******************************************************************************
 List of additional temporary variables created:
 dLTBSWIS = LTBSWIS-LTBSWIS(-1)
 dLRERSWIS = LRERSWIS-LRERSWIS(-1)
 dLRERSWIS1 = LRERSWIS(-1)-LRERSWIS(-2)
 dLRERSWIS2 = LRERSWIS(-2)-LRERSWIS(-3)
 dLRERSWIS3 = LRERSWIS(-3)-LRERSWIS(-4)
 dLRERSWIS4 = LRERSWIS(-4)-LRERSWIS(-5)
 dINPT = INPT-INPT(-1)
 ecm = LTBSWIS  -.080805*LRERSWIS   -.90502*INPT
*******************************************************************************
 R-Squared                      .37738   R-Bar-Squared                    .22173
 S.E. of Regression             .34397   F-stat.    F(  6,  29)    2.8286[.027]
 Mean of Dependent Variable   .057799   S.D. of Dependent Variable      .38991
 Residual Sum of Squares       3.3129   Equation Log-likelihood        -8.1393
 Akaike Info. Criterion      -16.1393   Schwarz Bayesian Criterion    -22.4734
 DW-statistic                  1.9491
*******************************************************************************
 R-Squared and R-Bar-Squared measures refer to the dependent variable
 dLTBSWIS and in cases where the error correction model is highly
 restricted, these measures could become negative.
```

USA's ARDL

```
          Error Correction Representation for the Selected ARDL Model
         ARDL(0,2,0,1) selected based on Akaike Information Criterion
*******************************************************************************
 Dependent variable is dLTBUSA
 39 observations used for estimation from 1962 to 2000
*******************************************************************************
 Regressor              Coefficient       Standard Error         T-Ratio[Prob]
 dLRYTUR                    2.0368            1.1739              1.7350[.092]
 dLRYTUR1                  -1.8663            1.0547             -1.7696[.086]
 dLRYUSA                   -2.1722            .79116             -2.7456[.010]
 dLRERUSA                   .31857            .17300              1.8414[.075]
 dINPT                     -5.5431            3.0514             -1.8166[.078]
 ecm(-1)                   -1.0000              0.00              *NONE*
*******************************************************************************
 List of additional temporary variables created:
 dLTBUSA = LTBUSA-LTBUSA(-1)
 dLRYTUR = LRYTUR-LRYTUR(-1)
 dLRYTUR1 = LRYTUR(-1)-LRYTUR(-2)
 dLRYUSA = LRYUSA-LRYUSA(-1)
 dLRERUSA = LRERUSA-LRERUSA(-1)
 dINPT = INPT-INPT(-1)
 ecm = LTBUSA   -1.4217*LRYTUR +   2.1722*LRYUSA +  .034428*LRERUSA +   5.5431
*INPT
*******************************************************************************
 R-Squared                     .62720   R-Bar-Squared                   .55730
 S.E. of Regression            .23823   F-stat.    F(  5,  33)   10.7673[.000]
 Mean of Dependent Variable  -.010825   S.D. of Dependent Variable      .35805
 Residual Sum of Squares       1.8161   Equation Log-likelihood         4.4652
 Akaike Info. Criterion       -2.5348   Schwarz Bayesian Criterion     -8.3573
 DW-statistic                  2.3150
*******************************************************************************
 R-Squared and R-Bar-Squared measures refer to the dependent variable
 dLTBUSA and in cases where the error correction model is highly
 restricted, these measures could become negative.
            Estimated Long Run Coefficients using the ARDL Approach
         ARDL(0,2,0,1) selected based on Akaike Information Criterion
*******************************************************************************
 Dependent variable is LTBUSA
 39 observations used for estimation from 1962 to 2000
*******************************************************************************
 Regressor              Coefficient       Standard Error         T-Ratio[Prob]
 LRYTUR                     1.4217            .54138              2.6261[.013]
 LRYUSA                    -2.1722            .79116             -2.7456[.010]
 LRERUSA                  -.034428           .014374             -2.3952[.023]
 INPT                      -5.5431            3.0514             -1.8166[.079]
*******************************************************************************
```

USA's ARDL

```
         Error Correction Representation for the Selected ARDL Model
                            ARDL(2,5) selected
*******************************************************************************
 Dependent variable is dLTBUSA
 36 observations used for estimation from 1965 to 2000
*******************************************************************************
 Regressor              Coefficient       Standard Error         T-Ratio[Prob]
 dLTBUSA1                   .12238             .18442            .66360[.512]
 dLRERUSA                   .31690             .18284            1.7332[.094]
 dLRERUSA1                  .16471             .20317            .81066[.424]
 dLRERUSA2                  .17525             .18767            .93386[.358]
 dLRERUSA3                -.079898             .18975           -.42106[.677]
 dLRERUSA4                  .23419             .18667            1.2546[.220]
 dINPT                      .54273             .20368            2.6646[.013]
 ecm(-1)                   -1.1462             .27681           -4.1409[.000]
*******************************************************************************
 List of additional temporary variables created:
 dLTBUSA = LTBUSA-LTBUSA(-1)
 dLTBUSA1 = LTBUSA(-1)-LTBUSA(-2)
 dLRERUSA = LRERUSA-LRERUSA(-1)
 dLRERUSA1 = LRERUSA(-1)-LRERUSA(-2)
 dLRERUSA2 = LRERUSA(-2)-LRERUSA(-3)
 dLRERUSA3 = LRERUSA(-3)-LRERUSA(-4)
 dLRERUSA4 = LRERUSA(-4)-LRERUSA(-5)
 dINPT = INPT-INPT(-1)
 ecm = LTBUSA +  .048111*LRERUSA   -.47348*INPT
*******************************************************************************
 R-Squared                     .51493   R-Bar-Squared                   .37121
 S.E. of Regression            .27008   F-stat.    F(  7,  28)    4.0946[.003]
 Mean of Dependent Variable  -.011447   S.D. of Dependent Variable      .34060
 Residual Sum of Squares       1.9695   Equation Log-likelihood         1.2213
 Akaike Info. Criterion       -7.7787   Schwarz Bayesian Criterion    -14.9046
 DW-statistic                  2.0883
*******************************************************************************
 R-Squared and R-Bar-Squared measures refer to the dependent variable
 dLTBUSA and in cases where the error correction model is highly
 restricted, these measures could become negative.
```

ARDL for Aggregate

```
         Error Correction Representation for the Selected ARDL Model
        ARDL(1,1,2,0) selected based on Akaike Information Criterion
*******************************************************************************
 Dependent variable is dLTBTUR
 39 observations used for estimation from 1962 to 2000
*******************************************************************************
 Regressor              Coefficient       Standard Error         T-Ratio[Prob]
 dLRYTUR                    1.5911             .68276              2.3303[.026]
 dLRYWORLD                 -2.2626             .86556             -2.6141[.013]
 dLRYWORLD1                 1.1168             .84304              1.3247[.194]
 dLREER9                   -.52243             .15378             -3.3973[.002]
 dINPT                     .028189             1.0271             .027447[.978]
 ecm(-1)                   -.51790             .13481             -3.8416[.001]
*******************************************************************************
 List of additional temporary variables created:
 dLTBTUR = LTBTUR-LTBTUR(-1)
 dLRYTUR = LRYTUR-LRYTUR(-1)
 dLRYWORLD = LRYWORLD-LRYWORLD(-1)
 dLRYWORLD1 = LRYWORLD(-1)-LRYWORLD(-2)
 dLREER9 = LREER9-LREER9(-1)
 dINPT = INPT-INPT(-1)
 ecm = LTBTUR   -.93794*LRYTUR +   .84101*LRYWORLD +   1.0088*LREER9  -.054430
*INPT
*******************************************************************************
 R-Squared                     .56314   R-Bar-Squared                    .46449
 S.E. of Regression            .14851   F-stat.    F(  5,  33)    7.9921[.000]
 Mean of Dependent Variable -.0015603   S.D. of Dependent Variable      .20294
 Residual Sum of Squares       .68368   Equation Log-likelihood        23.5159
 Akaike Info. Criterion       15.5159   Schwarz Bayesian Criterion      8.8617
 DW-statistic                  2.0958
*******************************************************************************
 R-Squared and R-Bar-Squared measures refer to the dependent variable
 dLTBTUR and in cases where the error correction model is highly
 restricted, these measures could become negative.
          Estimated Long Run Coefficients using the ARDL Approach
        ARDL(1,1,2,0) selected based on Akaike Information Criterion
*******************************************************************************
 Dependent variable is LTBTUR
 39 observations used for estimation from 1962 to 2000
*******************************************************************************
 Regressor              Coefficient       Standard Error         T-Ratio[Prob]
 LRYTUR                     .93794             .69814              1.3435[.189]
 LRYWORLD                  -.84101             1.1774             -.71431[.480]
 LREER9                    -1.0088             .26288             -3.8373[.001]
 INPT                      .054430             1.9811             .027475[.978]
*******************************************************************************
```

```
Error Correction Representation for the Selected ARDL Model
                              ARDL(2,5) selected
*******************************************************************************
 Dependent variable is dLTBTUR
 36 observations used for estimation from 1965 to 2000
*******************************************************************************
 Regressor              Coefficient       Standard Error         T-Ratio[Prob]
 dLTBTUR1                  -.11586             .17900            -.64726[.523]
 dLREER9                   -.34622             .23319            -1.4847[.149]
 dLREER91                  -.23441             .26194            -.89490[.378]
 dLREER92                 -.029977             .24283            -.12345[.903]
 dLREER93                  -.24636             .23778            -1.0361[.309]
 dLREER94                   .14104             .24289             .58070[.566]
 dINPT                      1.0027             .79129             1.2672[.216]
 ecm(-1)                   -.31166             .15776            -1.9756[.058]
*******************************************************************************
 List of additional temporary variables created:
 dLTBTUR = LTBTUR-LTBTUR(-1)
 dLTBTUR1 = LTBTUR(-1)-LTBTUR(-2)
 dLREER9 = LREER9-LREER9(-1)
 dLREER91 = LREER9(-1)-LREER9(-2)
 dLREER92 = LREER9(-2)-LREER9(-3)
 dLREER93 = LREER9(-3)-LREER9(-4)
 dLREER94 = LREER9(-4)-LREER9(-5)
 dINPT = INPT-INPT(-1)
 ecm = LTBTUR +   .43087*LREER9   -3.2174*INPT
*******************************************************************************
 R-Squared                     .35373   R-Bar-Squared                   .16224
 S.E. of Regression            .18354   F-stat.    F(  7,  28)    2.1111[.076]
 Mean of Dependent Variable  .0014194   S.D. of Dependent Variable      .20053
 Residual Sum of Squares       .90957   Equation Log-likelihood        15.1277
 Akaike Info. Criterion        6.1277   Schwarz Bayesian Criterion     -.99818
 DW-statistic                  2.2069
*******************************************************************************
 R-Squared and R-Bar-Squared measures refer to the dependent variable
 dLTBTUR and in cases where the error correction model is highly
 restricted, these measures could become negative.
```

Appendix D :Johansen Microfit Results

Austria Unit root tests

```
                     Unit root tests for variable LTBAVUS
      The Dickey-Fuller regressions include an intercept but not a trend
*******************************************************************************
 35 observations used in the estimation of all ADF regressions.
 Sample period from 1966 to 2000
*******************************************************************************
        Test Statistic      LL           AIC           SBC           HQC
 DF         -2.9571       -2.8401       -4.8401       -6.3955       -5.3771
 ADF(1)     -2.4366       -2.7232       -5.7232       -8.0562       -6.5285
 ADF(2)     -1.9343       -1.9583       -5.9583       -9.0690       -7.0321
 ADF(3)     -2.1172       -1.2960       -6.2960      -10.1844       -7.6383
 ADF(4)     -1.7265       -.92214       -6.9221      -11.5882       -8.5329
 ADF(5)     -1.9816      -.025891       -7.0259      -12.4696       -8.9051
*******************************************************************************
 95% critical value for the augmented Dickey-Fuller statistic =  -2.9472
 LL  = Maximized log-likelihood      AIC = Akaike Information Criterion
 SBC = Schwarz Bayesian Criterion    HQC = Hannan-Quinn Criterion
```

```
                     Unit root tests for variable LTBAVUS
     The Dickey-Fuller regressions include an intercept and a linear trend
*******************************************************************************
 35 observations used in the estimation of all ADF regressions.
 Sample period from 1966 to 2000
*******************************************************************************
        Test Statistic      LL           AIC           SBC           HQC
 DF         -3.1600       -2.1825       -5.1825       -7.5156       -5.9879
 ADF(1)     -2.6096       -2.1730       -6.1730       -9.2837       -7.2468
 ADF(2)     -1.8762       -1.7732       -6.7732      -10.6615       -8.1154
 ADF(3)     -2.3250       -.57774       -6.5777      -11.2438       -8.1885
 ADF(4)     -1.7601       -.51035       -7.5104      -12.9541       -9.3895
 ADF(5)     -2.3094        1.0985       -6.9015      -13.1229       -9.0492
*******************************************************************************
 95% critical value for the augmented Dickey-Fuller statistic =  -3.5426
 LL  = Maximized log-likelihood      AIC = Akaike Information Criterion
 SBC = Schwarz Bayesian Criterion    HQC = Hannan-Quinn Criterion
```

Belgium Unit root tests

```
                       Unit root tests for variable LTBL
      The Dickey-Fuller regressions include an intercept but not a trend
*******************************************************************************
 35 observations used in the estimation of all ADF regressions.
 Sample period from 1966 to 2000
*******************************************************************************
        Test Statistic      LL           AIC           SBC           HQC
 DF          -4.0555      -12.0761      -14.0761      -15.6315      -14.6130
 ADF(1)      -3.0120       -7.2543      -10.2543      -12.5873      -11.0596
 ADF(2)      -2.8916       -7.2542      -11.2542      -14.3649      -12.3280
 ADF(3)      -2.8454       -7.2245      -12.2245      -16.1129      -13.5668
 ADF(4)      -2.6609       -6.2707      -12.2707      -16.9367      -13.8814
 ADF(5)      -2.6716       -6.1200      -13.1200      -18.5638      -14.9992
*******************************************************************************
 95% critical value for the augmented Dickey-Fuller statistic =  -2.9472
 LL  = Maximized log-likelihood      AIC = Akaike Information Criterion
 SBC = Schwarz Bayesian Criterion    HQC = Hannan-Quinn Criterion
```

```
                       Unit root tests for variable LTBL
     The Dickey-Fuller regressions include an intercept and a linear trend
*******************************************************************************
 35 observations used in the estimation of all ADF regressions.
 Sample period from 1966 to 2000
*******************************************************************************
        Test Statistic      LL           AIC           SBC           HQC
 DF          -4.2329      -10.8709      -13.8709      -16.2039      -14.6763
 ADF(1)      -2.4019       -7.1936      -11.1936      -14.3043      -12.2675
 ADF(2)      -2.2303       -7.1843      -12.1843      -16.0727      -13.5266
 ADF(3)      -2.1861       -7.1130      -13.1130      -17.7791      -14.7238
 ADF(4)      -1.7247       -6.2673      -13.2673      -18.7111      -15.1465
 ADF(5)      -1.7789       -6.0943      -14.0943      -20.3157      -16.2419
*******************************************************************************
 95% critical value for the augmented Dickey-Fuller statistic =  -3.5426
 LL  = Maximized log-likelihood      AIC = Akaike Information Criterion
 SBC = Schwarz Bayesian Criterion    HQC = Hannan-Quinn Criterion
```

England Unit root tests

Unit root tests for variable LTBENG

The Dickey-Fuller regressions include an intercept but not a trend

35 observations used in the estimation of all ADF regressions.

Sample period from 1966 to 2000

	Test Statistic	LL	AIC	SBC	HQC
DF	-1.7199	-.54994	-2.5499	-4.1053	-3.0868
ADF(1)	-1.5051	-.39292	-3.3929	-5.7259	-4.1983
ADF(2)	-1.2826	.63037	-3.3696	-6.4803	-4.4434
ADF(3)	-1.2002	2.9500	-2.0500	-5.9384	-3.3923
ADF(4)	-1.3307	4.2979	-1.7021	-6.3682	-3.3129
ADF(5)	-1.2588	4.4718	-2.5282	-7.9719	-4.4074

95% critical value for the augmented Dickey-Fuller statistic = -2.9472

LL = Maximized log-likelihood AIC = Akaike Information Criterion

SBC = Schwarz Bayesian Criterion HQC = Hannan-Quinn Criterion

Unit root tests for variable LTBENG

The Dickey-Fuller regressions include an intercept and a linear trend

35 observations used in the estimation of all ADF regressions.

Sample period from 1966 to 2000

	Test Statistic	LL	AIC	SBC	HQC
DF	-3.1258	2.6204	-.37964	-2.7127	-1.1850
ADF(1)	-2.9759	2.8104	-1.1896	-4.3003	-2.2635
ADF(2)	-2.4109	2.8393	-2.1607	-6.0491	-3.5030
ADF(3)	-1.5032	3.6556	-2.3444	-7.0105	-3.9551
ADF(4)	-.84849	4.3854	-2.6146	-8.0583	-4.4937
ADF(5)	-1.1076	4.8030	-3.1970	-9.4183	-5.3446

95% critical value for the augmented Dickey-Fuller statistic = -3.5426

LL = Maximized log-likelihood AIC = Akaike Information Criterion

SBC = Schwarz Bayesian Criterion HQC = Hannan-Quinn Criterion

France Unit root tests

Unit root tests for variable LTBFRA

The Dickey-Fuller regressions include an intercept but not a trend

****

35 observations used in the estimation of all ADF regressions.

Sample period from 1966 to 2000

****

	Test Statistic	LL	AIC	SBC	HQC
DF	-2.8989	-6.9176	-8.9176	-10.4729	-9.4545
ADF(1)	-2.4720	-6.7265	-9.7265	-12.0595	-10.5319
ADF(2)	-1.9091	-6.1241	-10.1241	-13.2347	-11.1979
ADF(3)	-2.8961	-1.8940	-6.8940	-10.7824	-8.2363
ADF(4)	-2.6101	-1.8938	-7.8938	-12.5599	-9.5045
ADF(5)	-2.9731	-.60519	-7.6052	-13.0489	-9.4844

****

95% critical value for the augmented Dickey-Fuller statistic = -2.9472

LL = Maximized log-likelihood AIC = Akaike Information Criterion

SBC = Schwarz Bayesian Criterion HQC = Hannan-Quinn Criterion

Unit root tests for variable LTBFRA

The Dickey-Fuller regressions include an intercept and a linear trend

****

35 observations used in the estimation of all ADF regressions.

Sample period from 1966 to 2000

****

	Test Statistic	LL	AIC	SBC	HQC
DF	-2.8128	-6.9003	-9.9003	-12.2334	-10.7057
ADF(1)	-2.3329	-6.7251	-10.7251	-13.8358	-11.7989
ADF(2)	-1.7674	-6.1229	-11.1229	-15.0112	-12.4651
ADF(3)	-2.7242	-1.8916	-7.8916	-12.5576	-9.5023
ADF(4)	-2.4388	-1.8915	-8.8915	-14.3352	-10.7707
ADF(5)	-2.8468	-.52294	-8.5229	-14.7443	-10.6706

****

95% critical value for the augmented Dickey-Fuller statistic = -3.5426

LL = Maximized log-likelihood AIC = Akaike Information Criterion

SBC = Schwarz Bayesian Criterion HQC = Hannan-Quinn Criterion

Germany Unit root tests

```
                      Unit root tests for variable LTBGER
      The Dickey-Fuller regressions include an intercept but not a trend
*******************************************************************************
 35 observations used in the estimation of all ADF regressions.
 Sample period from 1966 to 2000
*******************************************************************************
        Test Statistic      LL           AIC           SBC           HQC
 DF          -2.0303       8.1732        6.1732        4.6178        5.6363
 ADF(1)      -1.8129       8.1926        5.1926        2.8596        4.3872
 ADF(2)      -1.6837       8.1932        4.1932        1.0825        3.1194
 ADF(3)      -1.4280       8.3756        3.3756       -.51277        2.0333
 ADF(4)      -1.3346       8.3806        2.3806       -2.2854        .76989
 ADF(5)      -1.3890       8.5108        1.5108       -3.9329       -.36836
*******************************************************************************
 95% critical value for the augmented Dickey-Fuller statistic =  -2.9472
 LL  = Maximized log-likelihood      AIC = Akaike Information Criterion
 SBC = Schwarz Bayesian Criterion    HQC = Hannan-Quinn Criterion
```

```
                      Unit root tests for variable LTBGER
     The Dickey-Fuller regressions include an intercept and a linear trend
*******************************************************************************
 35 observations used in the estimation of all ADF regressions.
 Sample period from 1966 to 2000
*******************************************************************************
        Test Statistic      LL           AIC           SBC           HQC
 DF          -2.7669      10.0141        7.0141        4.6811        6.2087
 ADF(1)      -2.5578      10.0155        6.0155        2.9048        4.9417
 ADF(2)      -2.4829      10.1074        5.1074        1.2190        3.7651
 ADF(3)      -2.2165      10.1140        4.1140       -.55201        2.5033
 ADF(4)      -2.1754      10.2065        3.2065       -2.2372        1.3273
 ADF(5)      -2.3886      10.8393        2.8393       -3.3821        .69163
*******************************************************************************
 95% critical value for the augmented Dickey-Fuller statistic =  -3.5426
 LL  = Maximized log-likelihood      AIC = Akaike Information Criterion
 SBC = Schwarz Bayesian Criterion    HQC = Hannan-Quinn Criterion
```

Holland Unit root tests

Unit root tests for variable LTBHOL

The Dickey-Fuller regressions include an intercept but not a trend

****

35 observations used in the estimation of all ADF regressions.

Sample period from 1966 to 2000

****

	Test Statistic	LL	AIC	SBC	HQC
DF	-3.1933	-4.9121	-6.9121	-8.4674	-7.4490
ADF(1)	-2.7253	-3.9029	-6.9029	-9.2359	-7.7083
ADF(2)	-2.6207	-3.7369	-7.7369	-10.8476	-8.8107
ADF(3)	-2.7363	-2.8702	-7.8702	-11.7585	-9.2124
ADF(4)	-2.8080	-2.5550	-8.5550	-13.2211	-10.1657
ADF(5)	-2.7584	-2.4823	-9.4823	-14.9260	-11.3614

****

95% critical value for the augmented Dickey-Fuller statistic = -2.9472

LL = Maximized log-likelihood AIC = Akaike Information Criterion

SBC = Schwarz Bayesian Criterion HQC = Hannan-Quinn Criterion

Unit root tests for variable LTBHOL

The Dickey-Fuller regressions include an intercept and a linear trend

****

35 observations used in the estimation of all ADF regressions.

Sample period from 1966 to 2000

****

	Test Statistic	LL	AIC	SBC	HQC
DF	-2.9701	-4.7685	-7.7685	-10.1015	-8.5739
ADF(1)	-2.3350	-3.4171	-7.4171	-10.5278	-8.4910
ADF(2)	-2.1196	-3.0030	-8.0030	-11.8914	-9.3453
ADF(3)	-2.2492	-2.4426	-8.4426	-13.1086	-10.0533
ADF(4)	-2.3014	-2.2246	-9.2246	-14.6683	-11.1038
ADF(5)	-2.2201	-2.1942	-10.1942	-16.4156	-12.3419

****

95% critical value for the augmented Dickey-Fuller statistic = -3.5426

LL = Maximized log-likelihood AIC = Akaike Information Criterion

SBC = Schwarz Bayesian Criterion HQC = Hannan-Quinn Criterion

Italy Unit root tests

Unit root tests for variable LTBITA

The Dickey-Fuller regressions include an intercept but not a trend

****

35 observations used in the estimation of all ADF regressions.

Sample period from 1966 to 2000

****

	Test Statistic	LL	AIC	SBC	HQC
DF	-3.3019	-8.4914	-10.4914	-12.0468	-11.0283
ADF(1)	-2.4027	-7.6056	-10.6056	-12.9387	-11.4110
ADF(2)	-2.0889	-7.2699	-11.2699	-14.3806	-12.3437
ADF(3)	-2.1053	-7.1566	-12.1566	-16.0450	-13.4989
ADF(4)	-2.4654	-5.8465	-11.8465	-16.5125	-13.4572
ADF(5)	-2.7475	-4.9607	-11.9607	-17.4044	-13.8399

****

95% critical value for the augmented Dickey-Fuller statistic = -2.9472

LL = Maximized log-likelihood AIC = Akaike Information Criterion

SBC = Schwarz Bayesian Criterion HQC = Hannan-Quinn Criterion

Unit root tests for variable LTBITA

The Dickey-Fuller regressions include an intercept and a linear trend

****

35 observations used in the estimation of all ADF regressions.

Sample period from 1966 to 2000

****

	Test Statistic	LL	AIC	SBC	HQC
DF	-3.2365	-8.4751	-11.4751	-13.8082	-12.2805
ADF(1)	-2.3305	-7.5590	-11.5590	-14.6697	-12.6328
ADF(2)	-1.9977	-7.1864	-12.1864	-16.0747	-13.5286
ADF(3)	-2.0069	-7.0951	-13.0951	-17.7611	-14.7058
ADF(4)	-2.3600	-5.8096	-12.8096	-18.2534	-14.6888
ADF(5)	-2.6349	-4.9416	-12.9416	-19.1630	-15.0893

****

95% critical value for the augmented Dickey-Fuller statistic = -3.5426

LL = Maximized log-likelihood AIC = Akaike Information Criterion

SBC = Schwarz Bayesian Criterion HQC = Hannan-Quinn Criterion

Switzerland Unit root tests

```
                     Unit root tests for variable LTBSWIS
      The Dickey-Fuller regressions include an intercept but not a trend
*******************************************************************************
 35 observations used in the estimation of all ADF regressions.
 Sample period from 1966 to 2000
*******************************************************************************
        Test Statistic      LL           AIC           SBC           HQC
 DF          -2.1497      -12.4819      -14.4819      -16.0373      -15.0188
 ADF(1)      -1.8983      -12.2774      -15.2774      -17.6105      -16.0828
 ADF(2)      -1.4880      -10.1832      -14.1832      -17.2939      -15.2570
 ADF(3)      -1.5576       -9.5870      -14.5870      -18.4754      -15.9293
 ADF(4)      -1.4695       -9.5734      -15.5734      -20.2394      -17.1841
 ADF(5)      -1.4212       -9.5701      -16.5701      -22.0138      -18.4493
*******************************************************************************
 95% critical value for the augmented Dickey-Fuller statistic =  -2.9472
 LL  = Maximized log-likelihood      AIC = Akaike Information Criterion
 SBC = Schwarz Bayesian Criterion    HQC = Hannan-Quinn Criterion
```

```
                     Unit root tests for variable LTBSWIS
     The Dickey-Fuller regressions include an intercept and a linear trend
*******************************************************************************
 35 observations used in the estimation of all ADF regressions.
 Sample period from 1966 to 2000
*******************************************************************************
        Test Statistic      LL           AIC           SBC           HQC
 DF          -2.9506      -10.5627      -13.5627      -15.8958      -14.3681
 ADF(1)      -2.6492      -10.5603      -14.5603      -17.6710      -15.6341
 ADF(2)      -1.9094       -9.3280      -14.3280      -18.2163      -15.6702
 ADF(3)      -2.2241       -8.1652      -14.1652      -18.8313      -15.7760
 ADF(4)      -2.1602       -8.1027      -15.1027      -20.5464      -16.9819
 ADF(5)      -2.1869       -7.9060      -15.9060      -22.1274      -18.0536
*******************************************************************************
 95% critical value for the augmented Dickey-Fuller statistic =  -3.5426
 LL  = Maximized log-likelihood      AIC = Akaike Information Criterion
 SBC = Schwarz Bayesian Criterion    HQC = Hannan-Quinn Criterion
```

USA Unit root tests

```
                      Unit root tests for variable LTBUSA
      The Dickey-Fuller regressions include an intercept but not a trend
*******************************************************************************
 35 observations used in the estimation of all ADF regressions.
 Sample period from 1966 to 2000
*******************************************************************************
        Test Statistic      LL          AIC          SBC          HQC
 DF          -4.0721      -4.8197      -6.8197      -8.3751      -7.3567
 ADF(1)      -2.8834      -4.7763      -7.7763     -10.1093      -8.5816
 ADF(2)      -2.5346      -4.7303      -8.7303     -11.8409      -9.8041
 ADF(3)      -2.7277      -4.0769      -9.0769     -12.9653     -10.4192
 ADF(4)      -1.7200      -3.4565      -9.4565     -14.1226     -11.0673
 ADF(5)      -1.5281      -3.4564     -10.4564     -15.9002     -12.3356
*******************************************************************************
 95% critical value for the augmented Dickey-Fuller statistic =  -2.9472
 LL  = Maximized log-likelihood      AIC = Akaike Information Criterion
 SBC = Schwarz Bayesian Criterion    HQC = Hannan-Quinn Criterion
```

```
                      Unit root tests for variable LTBUSA
     The Dickey-Fuller regressions include an intercept and a linear trend
*******************************************************************************
 35 observations used in the estimation of all ADF regressions.
 Sample period from 1966 to 2000
*******************************************************************************
        Test Statistic      LL          AIC          SBC          HQC
 DF          -4.0635      -4.4984      -7.4984      -9.8314      -8.3037
 ADF(1)      -2.8312      -4.4289      -8.4289     -11.5396      -9.5027
 ADF(2)      -2.4840      -4.3850      -9.3850     -13.2734     -10.7273
 ADF(3)      -2.6604      -3.7582      -9.7582     -14.4242     -11.3689
 ADF(4)      -1.6262      -3.0413     -10.0413     -15.4850     -11.9205
 ADF(5)      -1.3885      -3.0355     -11.0355     -17.2569     -13.1831
*******************************************************************************
 95% critical value for the augmented Dickey-Fuller statistic =  -3.5426
 LL  = Maximized log-likelihood      AIC = Akaike Information Criterion
 SBC = Schwarz Bayesian Criterion    HQC = Hannan-Quinn Criterion
```

Aggregate Unit root tests

```
                     Unit root tests for variable LTBTUR
      The Dickey-Fuller regressions include an intercept but not a trend
*******************************************************************************
 35 observations used in the estimation of all ADF regressions.
 Sample period from 1966 to 2000
*******************************************************************************
        Test Statistic      LL           AIC          SBC          HQC
 DF         -2.6192        9.9266       7.9266       6.3712       7.3897
 ADF(1)     -2.0920       10.2898       7.2898       4.9568       6.4844
 ADF(2)     -1.7259       10.5349       6.5349       3.4242       5.4611
 ADF(3)     -2.1148       11.8450       6.8450       2.9567       5.5028
 ADF(4)     -1.8995       11.8697       5.8697       1.2037       4.2590
 ADF(5)     -2.1235       12.5469       5.5469       .10319       3.6677
*******************************************************************************
 95% critical value for the augmented Dickey-Fuller statistic =  -2.9472
 LL  = Maximized log-likelihood      AIC = Akaike Information Criterion
 SBC = Schwarz Bayesian Criterion    HQC = Hannan-Quinn Criterion
```

```
                     Unit root tests for variable LTBTUR
     The Dickey-Fuller regressions include an intercept and a linear trend
*******************************************************************************
 35 observations used in the estimation of all ADF regressions.
 Sample period from 1966 to 2000
*******************************************************************************
        Test Statistic      LL           AIC          SBC          HQC
 DF         -2.7618       10.7052       7.7052       5.3722       6.8999
 ADF(1)     -2.2098       11.1690       7.1690       4.0583       6.0951
 ADF(2)     -1.8396       11.4101       6.4101       2.5217       5.0678
 ADF(3)     -2.2360       12.8054       6.8054       2.1394       5.1947
 ADF(4)     -2.0230       12.8213       5.8213       .37757       3.9421
 ADF(5)     -2.2217       13.4563       5.4563      -.76511       3.3087
*******************************************************************************
 95% critical value for the augmented Dickey-Fuller statistic =  -3.5426
 LL  = Maximized log-likelihood      AIC = Akaike Information Criterion
 SBC = Schwarz Bayesian Criterion    HQC = Hannan-Quinn Criterion
```

```
                  Unit root tests for variable DLTBAVUS
     The Dickey-Fuller regressions include an intercept but not a trend
*******************************************************************************
 34 observations used in the estimation of all ADF regressions.
 Sample period from 1967 to 2000
*******************************************************************************
       Test Statistic      LL           AIC           SBC           HQC
 DF         -7.3181      -5.8620      -7.8620       -9.3883       -8.3825
 ADF(1)     -5.9695      -4.2935      -7.2935       -9.5830       -8.0743
 ADF(2)     -3.6058      -4.0649      -8.0649      -11.1176       -9.1059
 ADF(3)     -3.9847      -2.6164      -7.6164      -11.4323       -8.9178
 ADF(4)     -2.6558      -2.2461      -8.2461      -12.8251       -9.8077
 ADF(5)     -2.5377      -2.0578      -9.0578      -14.4000      -10.8796
*******************************************************************************
 95% critical value for the augmented Dickey-Fuller statistic =  -2.9499
 LL  = Maximized log-likelihood      AIC = Akaike Information Criterion
 SBC = Schwarz Bayesian Criterion    HQC = Hannan-Quinn Criterion


                  Unit root tests for variable DLTBAVUS
    The Dickey-Fuller regressions include an intercept and a linear trend
*******************************************************************************
 34 observations used in the estimation of all ADF regressions.
 Sample period from 1967 to 2000
*******************************************************************************
       Test Statistic      LL           AIC           SBC           HQC
 DF         -7.2417      -5.7330      -8.7330      -11.0225       -9.5138
 ADF(1)     -5.9705      -3.9899      -7.9899      -11.0426       -9.0309
 ADF(2)     -3.6178      -3.8411      -8.8411      -12.6570      -10.1425
 ADF(3)     -4.1074      -2.0043      -8.0043      -12.5834       -9.5659
 ADF(4)     -2.8180      -1.6429      -8.6429      -13.9852      -10.4648
 ADF(5)     -2.6768      -1.4678      -9.4678      -15.5732      -11.5499
*******************************************************************************
 95% critical value for the augmented Dickey-Fuller statistic =  -3.5468
 LL  = Maximized log-likelihood      AIC = Akaike Information Criterion
 SBC = Schwarz Bayesian Criterion    HQC = Hannan-Quinn Criterion
```

Unit root tests for variable DLTBL

The Dickey-Fuller regressions include an intercept but not a trend

****

34 observations used in the estimation of all ADF regressions.

Sample period from 1967 to 2000

****

	Test Statistic	LL	AIC	SBC	HQC
DF	-11.2190	-11.6363	-13.6363	-15.1627	-14.1569
ADF(1)	-5.8377	-11.2592	-14.2592	-16.5487	-15.0400
ADF(2)	-4.3650	-11.2409	-15.2409	-18.2936	-16.2820
ADF(3)	-4.4635	-9.9770	-14.9770	-18.7929	-16.2783
ADF(4)	-3.5815	-9.9373	-15.9373	-20.5164	-17.4989
ADF(5)	-2.7695	-9.4224	-16.4224	-21.7646	-18.2442

****

95% critical value for the augmented Dickey-Fuller statistic = -2.9499

LL = Maximized log-likelihood AIC = Akaike Information Criterion

SBC = Schwarz Bayesian Criterion HQC = Hannan-Quinn Criterion

Unit root tests for variable DLTBL

The Dickey-Fuller regressions include an intercept and a linear trend

****

34 observations used in the estimation of all ADF regressions.

Sample period from 1967 to 2000

****

	Test Statistic	LL	AIC	SBC	HQC
DF	-11.8570	-9.6773	-12.6773	-14.9669	-13.4581
ADF(1)	-6.5794	-8.6444	-12.6444	-15.6971	-13.6855
ADF(2)	-5.0612	-8.5668	-13.5668	-17.3827	-14.8682
ADF(3)	-5.2934	-6.6942	-12.6942	-17.2733	-14.2558
ADF(4)	-4.4808	-6.3823	-13.3823	-18.7246	-15.2042
ADF(5)	-3.6007	-5.9164	-13.9164	-20.0219	-15.9986

****

95% critical value for the augmented Dickey-Fuller statistic = -3.5468

LL = Maximized log-likelihood AIC = Akaike Information Criterion

SBC = Schwarz Bayesian Criterion HQC = Hannan-Quinn Criterion

```
                    Unit root tests for variable DLTBENG
     The Dickey-Fuller regressions include an intercept but not a trend
*******************************************************************************
 34 observations used in the estimation of all ADF regressions.
 Sample period from 1967 to 2000
*******************************************************************************
        Test Statistic      LL           AIC           SBC           HQC
 DF          -6.4509      -1.5754       -3.5754       -5.1018       -4.0960
 ADF(1)      -5.3653      -.51451       -3.5145       -5.8040       -4.2953
 ADF(2)      -5.5052       1.7793       -2.2207       -5.2734       -3.2618
 ADF(3)      -4.8353       2.7220       -2.2780       -6.0939       -3.5793
 ADF(4)      -3.2523       2.9517       -3.0483       -7.6274       -4.6099
 ADF(5)      -2.4489       3.1399       -3.8601       -9.2024       -5.6820
*******************************************************************************
 95% critical value for the augmented Dickey-Fuller statistic =  -2.9499
 LL  = Maximized log-likelihood      AIC = Akaike Information Criterion
 SBC = Schwarz Bayesian Criterion    HQC = Hannan-Quinn Criterion


                    Unit root tests for variable DLTBENG
    The Dickey-Fuller regressions include an intercept and a linear trend
*******************************************************************************
 34 observations used in the estimation of all ADF regressions.
 Sample period from 1967 to 2000
*******************************************************************************
        Test Statistic      LL           AIC           SBC           HQC
 DF          -6.3507      -1.5541       -4.5541       -6.8436       -5.3349
 ADF(1)      -5.2995      -.44774       -4.4477       -7.5005       -5.4888
 ADF(2)      -5.5194       2.1339       -2.8661       -6.6820       -4.1674
 ADF(3)      -4.9796       3.4935       -2.5065       -7.0856       -4.0681
 ADF(4)      -3.3704       3.5516       -3.4484       -8.7907       -5.2703
 ADF(5)      -2.5797       3.6419       -4.3581      -10.4636       -6.4402
*******************************************************************************
 95% critical value for the augmented Dickey-Fuller statistic =  -3.5468
 LL  = Maximized log-likelihood      AIC = Akaike Information Criterion
 SBC = Schwarz Bayesian Criterion    HQC = Hannan-Quinn Criterion
```

```
                 Unit root tests for variable DLTBFRA
     The Dickey-Fuller regressions include an intercept but not a trend
*******************************************************************************
 34 observations used in the estimation of all ADF regressions.
 Sample period from 1967 to 2000
*******************************************************************************
       Test Statistic      LL           AIC           SBC           HQC
 DF         -7.8057      -8.4817      -10.4817      -12.0081      -11.0022
 ADF(1)     -5.7475      -7.7193      -10.7193      -13.0088      -11.5001
 ADF(2)     -2.6675      -5.5011       -9.5011      -12.5539      -10.5422
 ADF(3)     -3.1618      -4.0648       -9.0648      -12.8807      -10.3662
 ADF(4)     -2.5024      -3.9812       -9.9812      -14.5603      -11.5428
 ADF(5)     -2.3958      -3.8934      -10.8934      -16.2356      -12.7152
*******************************************************************************
 95% critical value for the augmented Dickey-Fuller statistic =  -2.9499
 LL  = Maximized log-likelihood      AIC = Akaike Information Criterion
 SBC = Schwarz Bayesian Criterion    HQC = Hannan-Quinn Criterion
```

```
                 Unit root tests for variable DLTBFRA
    The Dickey-Fuller regressions include an intercept and a linear trend
*******************************************************************************
 34 observations used in the estimation of all ADF regressions.
 Sample period from 1967 to 2000
*******************************************************************************
       Test Statistic      LL           AIC           SBC           HQC
 DF         -7.6795      -8.4605      -11.4605      -13.7500      -12.2413
 ADF(1)     -5.6580      -7.6616      -11.6616      -14.7143      -12.7027
 ADF(2)     -2.6500      -5.4137      -10.4137      -14.2296      -11.7150
 ADF(3)     -3.1110      -4.0386      -10.0386      -14.6176      -11.6002
 ADF(4)     -2.4638      -3.9593      -10.9593      -16.3016      -12.7812
 ADF(5)     -2.3626      -3.8622      -11.8622      -17.9677      -13.9444
*******************************************************************************
 95% critical value for the augmented Dickey-Fuller statistic =  -3.5468
 LL  = Maximized log-likelihood      AIC = Akaike Information Criterion
 SBC = Schwarz Bayesian Criterion    HQC = Hannan-Quinn Criterion
```

```
                    Unit root tests for variable DLTBGER
     The Dickey-Fuller regressions include an intercept but not a trend
*******************************************************************************
 34 observations used in the estimation of all ADF regressions.
 Sample period from 1967 to 2000
*******************************************************************************
       Test Statistic      LL           AIC           SBC           HQC
 DF          -6.5666       6.4405       4.4405        2.9142        3.9200
 ADF(1)      -4.4754       6.5029       3.5029        1.2134        2.7221
 ADF(2)      -4.1023       7.0831       3.0831       .030392        2.0420
 ADF(3)      -3.4252       7.1607       2.1607       -1.6552        .85937
 ADF(4)      -2.6819       7.2198       1.2198       -3.3593       -.34182
 ADF(5)      -2.8359       7.8111       .81106       -4.5312       -1.0108
*******************************************************************************
 95% critical value for the augmented Dickey-Fuller statistic =  -2.9499
 LL  = Maximized log-likelihood      AIC = Akaike Information Criterion
 SBC = Schwarz Bayesian Criterion    HQC = Hannan-Quinn Criterion


                    Unit root tests for variable DLTBGER
    The Dickey-Fuller regressions include an intercept and a linear trend
*******************************************************************************
 34 observations used in the estimation of all ADF regressions.
 Sample period from 1967 to 2000
*******************************************************************************
       Test Statistic      LL           AIC           SBC           HQC
 DF          -6.4675       6.4802       3.4802        1.1906        2.6994
 ADF(1)      -4.4152       6.5471       2.5471       -.50560        1.5061
 ADF(2)      -4.0423       7.1124       2.1124       -1.7035        .81110
 ADF(3)      -3.3689       7.1864       1.1864       -3.3927       -.37521
 ADF(4)      -2.6375       7.2445       .24448       -5.0978       -1.5774
 ADF(5)      -2.7876       7.8388      -.16119       -6.2666       -2.2433
*******************************************************************************
 95% critical value for the augmented Dickey-Fuller statistic =  -3.5468
 LL  = Maximized log-likelihood      AIC = Akaike Information Criterion
 SBC = Schwarz Bayesian Criterion    HQC = Hannan-Quinn Criterion
```

```
                 Unit root tests for variable DLTBHOL
     The Dickey-Fuller regressions include an intercept but not a trend
*******************************************************************************
 34 observations used in the estimation of all ADF regressions.
 Sample period from 1967 to 2000
*******************************************************************************
       Test Statistic      LL           AIC           SBC           HQC
 DF         -8.0135       -7.8187       -9.8187      -11.3450      -10.3392
 ADF(1)     -5.1822       -7.5086      -10.5086      -12.7982      -11.2894
 ADF(2)     -3.0638       -7.0271      -11.0271      -14.0798      -12.0682
 ADF(3)     -2.4586       -7.0141      -12.0141      -15.8300      -13.3155
 ADF(4)     -2.3137       -6.9478      -12.9478      -17.5269      -14.5094
 ADF(5)     -1.8955       -6.8143      -13.8143      -19.1566      -15.6362
*******************************************************************************
 95% critical value for the augmented Dickey-Fuller statistic =  -2.9499
 LL  = Maximized log-likelihood      AIC = Akaike Information Criterion
 SBC = Schwarz Bayesian Criterion    HQC = Hannan-Quinn Criterion


                 Unit root tests for variable DLTBHOL
    The Dickey-Fuller regressions include an intercept and a linear trend
*******************************************************************************
 34 observations used in the estimation of all ADF regressions.
 Sample period from 1967 to 2000
*******************************************************************************
       Test Statistic      LL           AIC           SBC           HQC
 DF         -8.3431       -6.5201       -9.5201      -11.8097      -10.3009
 ADF(1)     -5.6776       -5.7085       -9.7085      -12.7612      -10.7495
 ADF(2)     -3.5271       -5.5598      -10.5598      -14.3757      -11.8612
 ADF(3)     -2.9449       -5.5569      -11.5569      -16.1360      -13.1185
 ADF(4)     -2.8128       -5.4192      -12.4192      -17.7615      -14.2411
 ADF(5)     -2.3905       -5.3575      -13.3575      -19.4629      -15.4396
*******************************************************************************
 95% critical value for the augmented Dickey-Fuller statistic =  -3.5468
 LL  = Maximized log-likelihood      AIC = Akaike Information Criterion
 SBC = Schwarz Bayesian Criterion    HQC = Hannan-Quinn Criterion
```

Unit root tests for variable DLTBITA

The Dickey-Fuller regressions include an intercept but not a trend

****

34 observations used in the estimation of all ADF regressions.

Sample period from 1967 to 2000

	Test Statistic	LL	AIC	SBC	HQC
DF	-8.7669	-10.1272	-12.1272	-13.6535	-12.6477
ADF(1)	-6.1627	-8.8782	-11.8782	-14.1677	-12.6590
ADF(2)	-4.1994	-8.8695	-12.8695	-15.9222	-13.9106
ADF(3)	-2.7451	-7.9930	-12.9930	-16.8089	-14.2943
ADF(4)	-2.2173	-7.8705	-13.8705	-18.4496	-15.4321
ADF(5)	-2.2075	-7.7218	-14.7218	-20.0641	-16.5437

95% critical value for the augmented Dickey-Fuller statistic = -2.9499

LL = Maximized log-likelihood AIC = Akaike Information Criterion

SBC = Schwarz Bayesian Criterion HQC = Hannan-Quinn Criterion

Unit root tests for variable DLTBITA

The Dickey-Fuller regressions include an intercept and a linear trend

34 observations used in the estimation of all ADF regressions.

Sample period from 1967 to 2000

	Test Statistic	LL	AIC	SBC	HQC
DF	-8.6336	-10.1079	-13.1079	-15.3975	-13.8887
ADF(1)	-6.0735	-8.8411	-12.8411	-15.8938	-13.8822
ADF(2)	-4.1406	-8.8300	-13.8300	-17.6459	-15.1313
ADF(3)	-2.6958	-7.9798	-13.9798	-18.5589	-15.5414
ADF(4)	-2.1762	-7.8603	-14.8603	-20.2026	-16.6822
ADF(5)	-2.1669	-7.7074	-15.7074	-21.8128	-17.7895

95% critical value for the augmented Dickey-Fuller statistic = -3.5468

LL = Maximized log-likelihood AIC = Akaike Information Criterion

SBC = Schwarz Bayesian Criterion HQC = Hannan-Quinn Criterion

Unit root tests for variable DLTBSWIS
The Dickey-Fuller regressions include an intercept but not a trend

34 observations used in the estimation of all ADF regressions.
Sample period from 1967 to 2000

	Test Statistic	LL	AIC	SBC	HQC
DF	-6.9621	-14.1086	-16.1086	-17.6350	-16.6291
ADF(1)	-6.5913	-11.3720	-14.3720	-16.6615	-15.1528
ADF(2)	-3.7174	-11.0001	-15.0001	-18.0528	-16.0411
ADF(3)	-3.2967	-10.9260	-15.9260	-19.7419	-17.2273
ADF(4)	-2.8738	-10.9031	-16.9031	-21.4822	-18.4647
ADF(5)	-2.1276	-10.5045	-17.5045	-22.8467	-19.3263

95% critical value for the augmented Dickey-Fuller statistic = -2.9499
LL = Maximized log-likelihood AIC = Akaike Information Criterion
SBC = Schwarz Bayesian Criterion HQC = Hannan-Quinn Criterion

Unit root tests for variable DLTBSWIS
The Dickey-Fuller regressions include an intercept and a linear trend

34 observations used in the estimation of all ADF regressions.
Sample period from 1967 to 2000

	Test Statistic	LL	AIC	SBC	HQC
DF	-6.8525	-14.1083	-17.1083	-19.3979	-17.8891
ADF(1)	-6.4876	-11.3578	-15.3578	-18.4105	-16.3988
ADF(2)	-3.6482	-10.9953	-15.9953	-19.8112	-17.2967
ADF(3)	-3.2299	-10.9173	-16.9173	-21.4964	-18.4789
ADF(4)	-2.8160	-10.8933	-17.8933	-23.2356	-19.7152
ADF(5)	-2.0810	-10.4996	-18.4996	-24.6050	-20.5817

95% critical value for the augmented Dickey-Fuller statistic = -3.5468
LL = Maximized log-likelihood AIC = Akaike Information Criterion
SBC = Schwarz Bayesian Criterion HQC = Hannan-Quinn Criterion

Unit root tests for variable DLTBUSA
The Dickey-Fuller regressions include an intercept but not a trend

34 observations used in the estimation of all ADF regressions.
Sample period from 1967 to 2000

	Test Statistic	LL	AIC	SBC	HQC
DF	-8.6848	-9.0272	-11.0272	-12.5536	-11.5478
ADF(1)	-5.7424	-8.2677	-11.2677	-13.5572	-12.0485
ADF(2)	-4.2424	-8.2051	-12.2051	-15.2578	-13.2462
ADF(3)	-4.9317	-5.4975	-10.4975	-14.3134	-11.7988
ADF(4)	-3.9905	-5.2022	-11.2022	-15.7813	-12.7638
ADF(5)	-3.6485	-4.7769	-11.7769	-17.1191	-13.5987

95% critical value for the augmented Dickey-Fuller statistic = -2.9499
LL = Maximized log-likelihood AIC = Akaike Information Criterion
SBC = Schwarz Bayesian Criterion HQC = Hannan-Quinn Criterion

Unit root tests for variable DLTBUSA
The Dickey-Fuller regressions include an intercept and a linear trend

34 observations used in the estimation of all ADF regressions.
Sample period from 1967 to 2000

	Test Statistic	LL	AIC	SBC	HQC
DF	-8.6634	-8.7047	-11.7047	-13.9942	-12.4855
ADF(1)	-5.7967	-7.8076	-11.8076	-14.8603	-12.8487
ADF(2)	-4.2884	-7.7499	-12.7499	-16.5658	-14.0512
ADF(3)	-4.9785	-4.9548	-10.9548	-15.5339	-12.5164
ADF(4)	-4.0648	-4.5940	-11.5940	-16.9362	-13.4158
ADF(5)	-3.7942	-3.9843	-11.9843	-18.0897	-14.0664

95% critical value for the augmented Dickey-Fuller statistic = -3.5468
LL = Maximized log-likelihood AIC = Akaike Information Criterion
SBC = Schwarz Bayesian Criterion HQC = Hannan-Quinn Criterion

```
                    Unit root tests for variable DLTBTUR
     The Dickey-Fuller regressions include an intercept but not a trend
*******************************************************************************
 34 observations used in the estimation of all ADF regressions.
 Sample period from 1967 to 2000
*******************************************************************************
        Test Statistic      LL           AIC           SBC           HQC
 DF          -7.5584       7.6370        5.6370        4.1107        5.1165
 ADF(1)      -5.3670       8.2646        5.2646        2.9751        4.4838
 ADF(2)      -3.1768       8.7391        4.7391        1.6863        3.6980
 ADF(3)      -3.1490       9.1629        4.1629        .34701        2.8616
 ADF(4)      -2.4623       9.2591        3.2591       -1.3200        1.6975
 ADF(5)      -1.8802       9.6659        2.6659       -2.6763        .84405
*******************************************************************************
 95% critical value for the augmented Dickey-Fuller statistic =  -2.9499
 LL  = Maximized log-likelihood      AIC = Akaike Information Criterion
 SBC = Schwarz Bayesian Criterion    HQC = Hannan-Quinn Criterion


                    Unit root tests for variable DLTBTUR
    The Dickey-Fuller regressions include an intercept and a linear trend
*******************************************************************************
 34 observations used in the estimation of all ADF regressions.
 Sample period from 1967 to 2000
*******************************************************************************
        Test Statistic      LL           AIC           SBC           HQC
 DF          -7.5623       8.0014        5.0014        2.7118        4.2206
 ADF(1)      -5.4447       8.7767        4.7767        1.7240        3.7357
 ADF(2)      -3.2685       9.2462        4.2462        .43025        2.9448
 ADF(3)      -3.2151       9.6545        3.6545       -.92463        2.0929
 ADF(4)      -2.5345       9.7328        2.7328       -2.6095        .91092
 ADF(5)      -1.9633      10.0426        2.0426       -4.0628      -.039505
*******************************************************************************
 95% critical value for the augmented Dickey-Fuller statistic =  -3.5468
 LL  = Maximized log-likelihood      AIC = Akaike Information Criterion
 SBC = Schwarz Bayesian Criterion    HQC = Hannan-Quinn Criterion
```

```
                    Unit root tests for variable LRYAVUS
     The Dickey-Fuller regressions include an intercept but not a trend
*******************************************************************************
 35 observations used in the estimation of all ADF regressions.
 Sample period from 1966 to 2000
*******************************************************************************
        Test Statistic      LL          AIC          SBC          HQC
 DF         -.91320      67.0948      65.0948      63.5394      64.5579
 ADF(1)     -.76314      68.3442      65.3442      63.0112      64.5388
 ADF(2)     -.83082      68.5670      64.5670      61.4563      63.4932
 ADF(3)     -.88658      68.6519      63.6519      59.7635      62.3096
 ADF(4)     -.97637      68.7944      62.7944      58.1283      61.1837
 ADF(5)     -.89074      68.8146      61.8146      56.3709      59.9355
*******************************************************************************
 95% critical value for the augmented Dickey-Fuller statistic =  -2.9472
 LL  = Maximized log-likelihood      AIC = Akaike Information Criterion
 SBC = Schwarz Bayesian Criterion    HQC = Hannan-Quinn Criterion
```

```
                    Unit root tests for variable LRYAVUS
    The Dickey-Fuller regressions include an intercept and a linear trend
*******************************************************************************
 35 observations used in the estimation of all ADF regressions.
 Sample period from 1966 to 2000
*******************************************************************************
        Test Statistic      LL          AIC          SBC          HQC
 DF         -2.0934      69.0436      66.0436      63.7106      65.2382
 ADF(1)     -2.4930      71.2756      67.2756      64.1649      66.2018
 ADF(2)     -2.3753      71.2845      66.2845      62.3962      64.9423
 ADF(3)     -2.3151      71.2862      65.2862      60.6202      63.6755
 ADF(4)     -2.2387      71.2874      64.2874      58.8437      62.4082
 ADF(5)     -2.2972      71.5719      63.5719      57.3505      61.4243
*******************************************************************************
 95% critical value for the augmented Dickey-Fuller statistic =  -3.5426
 LL  = Maximized log-likelihood      AIC = Akaike Information Criterion
 SBC = Schwarz Bayesian Criterion    HQC = Hannan-Quinn Criterion
```

```
                     Unit root tests for variable LRYBL
      The Dickey-Fuller regressions include an intercept but not a trend
*******************************************************************************
 35 observations used in the estimation of all ADF regressions.
 Sample period from 1966 to 2000
*******************************************************************************
        Test Statistic      LL           AIC           SBC           HQC
 DF          -1.3797       65.0428       63.0428       61.4875       62.5059
 ADF(1)      -1.4020       65.2755       62.2755       59.9425       61.4702
 ADF(2)      -1.4330       65.3549       61.3549       58.2442       60.2811
 ADF(3)      -1.5707       65.6853       60.6853       56.7969       59.3430
 ADF(4)      -1.6620       65.8944       59.8944       55.2284       58.2837
 ADF(5)      -1.3100       66.0633       59.0633       53.6196       57.1841
*******************************************************************************
 95% critical value for the augmented Dickey-Fuller statistic =  -2.9472
 LL  = Maximized log-likelihood      AIC = Akaike Information Criterion
 SBC = Schwarz Bayesian Criterion    HQC = Hannan-Quinn Criterion
```

```
                     Unit root tests for variable LRYBL
     The Dickey-Fuller regressions include an intercept and a linear trend
*******************************************************************************
 35 observations used in the estimation of all ADF regressions.
 Sample period from 1966 to 2000
*******************************************************************************
        Test Statistic      LL           AIC           SBC           HQC
 DF          -2.6514       67.7668       64.7668       62.4338       63.9615
 ADF(1)      -2.5103       67.7677       63.7677       60.6570       62.6939
 ADF(2)      -2.4589       67.7776       62.7776       58.8893       61.4354
 ADF(3)      -2.3838       67.9061       61.9061       57.2400       60.2953
 ADF(4)      -2.3462       67.9957       60.9957       55.5520       59.1165
 ADF(5)      -2.2834       68.3180       60.3180       54.0966       58.1704
*******************************************************************************
 95% critical value for the augmented Dickey-Fuller statistic =  -3.5426
 LL  = Maximized log-likelihood      AIC = Akaike Information Criterion
 SBC = Schwarz Bayesian Criterion    HQC = Hannan-Quinn Criterion
```

```
                   Unit root tests for variable LRYENG
     The Dickey-Fuller regressions include an intercept but not a trend
*******************************************************************************
 35 observations used in the estimation of all ADF regressions.
 Sample period from 1966 to 2000
*******************************************************************************
        Test Statistic      LL            AIC           SBC           HQC
 DF          -.93713       71.5161       69.5161       67.9608       68.9792
 ADF(1)      -.95044       71.9004       68.9004       66.5674       68.0950
 ADF(2)      -1.1144       74.7749       70.7749       67.6642       69.7011
 ADF(3)      -1.2034       75.2228       70.2228       66.3344       68.8805
 ADF(4)      -1.2058       75.2560       69.2560       64.5899       67.6453
 ADF(5)      -1.1523       75.2723       68.2723       62.8286       66.3932
*******************************************************************************
 95% critical value for the augmented Dickey-Fuller statistic =  -2.9472
 LL  = Maximized log-likelihood      AIC = Akaike Information Criterion
 SBC = Schwarz Bayesian Criterion    HQC = Hannan-Quinn Criterion


                   Unit root tests for variable LRYENG
    The Dickey-Fuller regressions include an intercept and a linear trend
*******************************************************************************
 35 observations used in the estimation of all ADF regressions.
 Sample period from 1966 to 2000
*******************************************************************************
        Test Statistic      LL            AIC           SBC           HQC
 DF          -2.9251       75.2625       72.2625       69.9295       71.4571
 ADF(1)      -3.9211       78.5022       74.5022       71.3915       73.4284
 ADF(2)      -3.0434       79.0075       74.0075       70.1192       72.6653
 ADF(3)      -2.8385       79.0108       73.0108       68.3447       71.4001
 ADF(4)      -2.8206       79.1214       72.1214       66.6776       70.2422
 ADF(5)      -2.9415       79.6310       71.6310       65.4096       69.4834
*******************************************************************************
 95% critical value for the augmented Dickey-Fuller statistic =  -3.5426
 LL  = Maximized log-likelihood      AIC = Akaike Information Criterion
 SBC = Schwarz Bayesian Criterion    HQC = Hannan-Quinn Criterion
```

Unit root tests for variable LRYFRA

The Dickey-Fuller regressions include an intercept but not a trend

****

35 observations used in the estimation of all ADF regressions.

Sample period from 1966 to 2000

****

	Test Statistic	LL	AIC	SBC	HQC
DF	-2.7230	74.1406	72.1406	70.5853	71.6037
ADF(1)	-2.5760	74.3786	71.3786	69.0456	70.5733
ADF(2)	-2.2863	74.4827	70.4827	67.3720	69.4089
ADF(3)	-2.0404	74.5021	69.5021	65.6137	68.1598
ADF(4)	-2.5722	76.1929	70.1929	65.5269	68.5822
ADF(5)	-2.4570	76.2543	69.2543	63.8105	67.3751

****

95% critical value for the augmented Dickey-Fuller statistic = -2.9472

LL = Maximized log-likelihood AIC = Akaike Information Criterion

SBC = Schwarz Bayesian Criterion HQC = Hannan-Quinn Criterion

Unit root tests for variable LRYFRA

The Dickey-Fuller regressions include an intercept and a linear trend

****

35 observations used in the estimation of all ADF regressions.

Sample period from 1966 to 2000

****

	Test Statistic	LL	AIC	SBC	HQC
DF	-2.5802	75.5208	72.5208	70.1878	71.7154
ADF(1)	-2.7039	76.1302	72.1302	69.0195	71.0563
ADF(2)	-2.6774	76.4053	71.4053	67.5170	70.0631
ADF(3)	-2.6412	76.5559	70.5559	65.8898	68.9452
ADF(4)	-2.6050	77.6392	70.6392	65.1954	68.7600
ADF(5)	-2.5580	77.6392	69.6392	63.4178	67.4916

****

95% critical value for the augmented Dickey-Fuller statistic = -3.5426

LL = Maximized log-likelihood AIC = Akaike Information Criterion

SBC = Schwarz Bayesian Criterion HQC = Hannan-Quinn Criterion

Unit root tests for variable LRYGER

The Dickey-Fuller regressions include an intercept but not a trend

****

35 observations used in the estimation of all ADF regressions.

Sample period from 1966 to 2000

****

	Test Statistic	LL	AIC	SBC	HQC
DF	-1.5906	65.0794	63.0794	61.5241	62.5425
ADF(1)	-1.4304	65.7056	62.7056	60.3726	61.9003
ADF(2)	-1.7775	67.8435	63.8435	60.7328	62.7697
ADF(3)	-1.6935	67.8439	62.8439	58.9556	61.5017
ADF(4)	-1.7220	67.9544	61.9544	57.2884	60.3437
ADF(5)	-2.0146	68.8132	61.8132	56.3694	59.9340

****

95% critical value for the augmented Dickey-Fuller statistic = -2.9472

LL = Maximized log-likelihood AIC = Akaike Information Criterion

SBC = Schwarz Bayesian Criterion HQC = Hannan-Quinn Criterion

Unit root tests for variable LRYGER

The Dickey-Fuller regressions include an intercept and a linear trend

****

35 observations used in the estimation of all ADF regressions.

Sample period from 1966 to 2000

****

	Test Statistic	LL	AIC	SBC	HQC
DF	-2.4015	67.0423	64.0423	61.7093	63.2370
ADF(1)	-2.7942	68.7233	64.7233	61.6126	63.6494
ADF(2)	-2.4319	69.8742	64.8742	60.9858	63.5320
ADF(3)	-2.4344	69.9853	63.9853	59.3192	62.3746
ADF(4)	-2.3764	69.9854	62.9854	57.5416	61.1062
ADF(5)	-2.2786	70.4335	62.4335	56.2121	60.2859

****

95% critical value for the augmented Dickey-Fuller statistic = -3.5426

LL = Maximized log-likelihood AIC = Akaike Information Criterion

SBC = Schwarz Bayesian Criterion HQC = Hannan-Quinn Criterion

Unit root tests for variable LRYHOL

The Dickey-Fuller regressions include an intercept but not a trend

****

35 observations used in the estimation of all ADF regressions.

Sample period from 1966 to 2000

****

	Test Statistic	LL	AIC	SBC	HQC
DF	-3.0667	77.9089	75.9089	74.3535	75.3720
ADF(1)	-2.4943	78.3774	75.3774	73.0444	74.5720
ADF(2)	-2.3780	78.4549	74.4549	71.3442	73.3811
ADF(3)	-2.1089	78.4610	73.4610	69.5726	72.1187
ADF(4)	-1.8471	78.5030	72.5030	67.8370	70.8923
ADF(5)	-1.6521	78.5484	71.5484	66.1047	69.6692

****

95% critical value for the augmented Dickey-Fuller statistic = -2.9472

LL = Maximized log-likelihood AIC = Akaike Information Criterion

SBC = Schwarz Bayesian Criterion HQC = Hannan-Quinn Criterion

Unit root tests for variable LRYHOL

The Dickey-Fuller regressions include an intercept and a linear trend

****

35 observations used in the estimation of all ADF regressions.

Sample period from 1966 to 2000

****

	Test Statistic	LL	AIC	SBC	HQC
DF	-2.4233	79.1195	76.1195	73.7865	75.3141
ADF(1)	-2.4285	79.8612	75.8612	72.7505	74.7874
ADF(2)	-2.4423	79.9879	74.9879	71.0995	73.6456
ADF(3)	-2.3555	79.9944	73.9944	69.3284	72.3837
ADF(4)	-2.2742	80.0787	73.0787	67.6350	71.1995
ADF(5)	-2.2540	80.2727	72.2727	66.0513	70.1251

****

95% critical value for the augmented Dickey-Fuller statistic = -3.5426

LL = Maximized log-likelihood AIC = Akaike Information Criterion

SBC = Schwarz Bayesian Criterion HQC = Hannan-Quinn Criterion

Unit root tests for variable LRYITA

The Dickey-Fuller regressions include an intercept but not a trend

35 observations used in the estimation of all ADF regressions.

Sample period from 1966 to 2000

	Test Statistic	LL	AIC	SBC	HQC
DF	-3.1288	64.7437	62.7437	61.1884	62.2068
ADF(1)	-3.2143	65.1240	62.1240	59.7910	61.3187
ADF(2)	-3.4986	66.1121	62.1121	59.0015	61.0383
ADF(3)	-3.1496	66.1123	61.1123	57.2239	59.7700
ADF(4)	-3.1219	66.3798	60.3798	55.7138	58.7691
ADF(5)	-3.9025	68.9786	61.9786	56.5349	60.0995

95% critical value for the augmented Dickey-Fuller statistic = -2.9472

LL = Maximized log-likelihood AIC = Akaike Information Criterion

SBC = Schwarz Bayesian Criterion HQC = Hannan-Quinn Criterion

Unit root tests for variable LRYITA

The Dickey-Fuller regressions include an intercept and a linear trend

35 observations used in the estimation of all ADF regressions.

Sample period from 1966 to 2000

	Test Statistic	LL	AIC	SBC	HQC
DF	-4.0166	69.4173	66.4173	64.0843	65.6120
ADF(1)	-3.9487	69.5522	65.5522	62.4415	64.4784
ADF(2)	-3.8430	70.0628	65.0628	61.1744	63.7205
ADF(3)	-3.7593	70.0875	64.0875	59.4215	62.4768
ADF(4)	-3.7359	70.2397	63.2397	57.7960	61.3606
ADF(5)	-4.4414	73.6498	65.6498	59.4284	63.5022

95% critical value for the augmented Dickey-Fuller statistic = -3.5426

LL = Maximized log-likelihood AIC = Akaike Information Criterion

SBC = Schwarz Bayesian Criterion HQC = Hannan-Quinn Criterion

```
                    Unit root tests for variable LRYSWIS
      The Dickey-Fuller regressions include an intercept but not a trend
*******************************************************************************
 35 observations used in the estimation of all ADF regressions.
 Sample period from 1966 to 2000
*******************************************************************************
        Test Statistic      LL            AIC           SBC           HQC
 DF          -.73912       63.3064       61.3064       59.7510       60.7695
 ADF(1)      -.64317       64.2017       61.2017       58.8686       60.3963
 ADF(2)      -.75010       65.1634       61.1634       58.0527       60.0896
 ADF(3)      -.48039       66.3238       61.3238       57.4355       59.9816
 ADF(4)      -.57123       66.4894       60.4894       55.8234       58.8787
 ADF(5)      -.76152       67.4880       60.4880       55.0443       58.6089
*******************************************************************************
 95% critical value for the augmented Dickey-Fuller statistic =  -2.9472
 LL  = Maximized log-likelihood      AIC = Akaike Information Criterion
 SBC = Schwarz Bayesian Criterion    HQC = Hannan-Quinn Criterion


                    Unit root tests for variable LRYSWIS
     The Dickey-Fuller regressions include an intercept and a linear trend
*******************************************************************************
 35 observations used in the estimation of all ADF regressions.
 Sample period from 1966 to 2000
*******************************************************************************
        Test Statistic      LL            AIC           SBC           HQC
 DF          -2.2082       65.5055       62.5055       60.1725       61.7002
 ADF(1)      -2.6612       67.5838       63.5838       60.4731       62.5100
 ADF(2)      -2.3525       67.8175       62.8175       58.9292       61.4753
 ADF(3)      -2.7332       70.2414       64.2414       59.5754       62.6307
 ADF(4)      -2.6657       70.2652       63.2652       57.8215       61.3860
 ADF(5)      -2.4024       70.5283       62.5283       56.3069       60.3807
*******************************************************************************
 95% critical value for the augmented Dickey-Fuller statistic =  -3.5426
 LL  = Maximized log-likelihood      AIC = Akaike Information Criterion
 SBC = Schwarz Bayesian Criterion    HQC = Hannan-Quinn Criterion
```

Unit root tests for variable LRYUSA

The Dickey-Fuller regressions include an intercept but not a trend

****

35 observations used in the estimation of all ADF regressions.

Sample period from 1966 to 2000

****

	Test Statistic	LL	AIC	SBC	HQC
DF	-.037797	62.6431	60.6431	59.0878	60.1062
ADF(1)	-.081188	63.2903	60.2903	57.9573	59.4849
ADF(2)	-.082836	65.7844	61.7844	58.6737	60.7105
ADF(3)	-.073623	65.7871	60.7871	56.8988	59.4449
ADF(4)	-.033915	65.8018	59.8018	55.1357	58.1911
ADF(5)	.044695	65.8930	58.8930	53.4493	57.0138

****

95% critical value for the augmented Dickey-Fuller statistic = -2.9472

LL = Maximized log-likelihood AIC = Akaike Information Criterion

SBC = Schwarz Bayesian Criterion HQC = Hannan-Quinn Criterion

Unit root tests for variable LRYUSA

The Dickey-Fuller regressions include an intercept and a linear trend

****

35 observations used in the estimation of all ADF regressions.

Sample period from 1966 to 2000

****

	Test Statistic	LL	AIC	SBC	HQC
DF	-2.0813	64.9296	61.9296	59.5966	61.1243
ADF(1)	-2.8884	67.5407	63.5407	60.4300	62.4669
ADF(2)	-2.1053	68.2244	63.2244	59.3360	61.8821
ADF(3)	-2.1522	68.4135	62.4135	57.7474	60.8028
ADF(4)	-2.1364	68.4965	61.4965	56.0527	59.6173
ADF(5)	-2.2084	68.8918	60.8918	54.6704	58.7442

****

95% critical value for the augmented Dickey-Fuller statistic = -3.5426

LL = Maximized log-likelihood AIC = Akaike Information Criterion

SBC = Schwarz Bayesian Criterion HQC = Hannan-Quinn Criterion

```
                     Unit root tests for variable LRYTUR
      The Dickey-Fuller regressions include an intercept but not a trend
*******************************************************************************
 35 observations used in the estimation of all ADF regressions.
 Sample period from 1966 to 2000
*******************************************************************************
        Test Statistic      LL           AIC          SBC          HQC
 DF          -1.5188       64.3739      62.3739      60.8186      61.8370
 ADF(1)      -1.6146       64.6884      61.6884      59.3554      60.8830
 ADF(2)      -1.6611       65.1499      61.1499      58.0392      60.0761
 ADF(3)      -1.5347       65.3508      60.3508      56.4624      59.0085
 ADF(4)      -1.8062       66.8098      60.8098      56.1438      59.1991
 ADF(5)      -1.4260       68.0874      61.0874      55.6437      59.2083
*******************************************************************************
 95% critical value for the augmented Dickey-Fuller statistic =  -2.9472
 LL  = Maximized log-likelihood      AIC = Akaike Information Criterion
 SBC = Schwarz Bayesian Criterion    HQC = Hannan-Quinn Criterion


                     Unit root tests for variable LRYTUR
     The Dickey-Fuller regressions include an intercept and a linear trend
*******************************************************************************
 35 observations used in the estimation of all ADF regressions.
 Sample period from 1966 to 2000
*******************************************************************************
        Test Statistic      LL           AIC          SBC          HQC
 DF          -3.0664       68.4379      65.4379      63.1048      64.6325
 ADF(1)      -2.9195       68.4932      64.4932      61.3825      63.4194
 ADF(2)      -2.6911       68.5070      63.5070      59.6186      62.1647
 ADF(3)      -2.8655       69.2909      63.2909      58.6249      61.6802
 ADF(4)      -2.5569       70.0132      63.0132      57.5695      61.1340
 ADF(5)      -3.2062       73.2864      65.2864      59.0650      63.1387
*******************************************************************************
 95% critical value for the augmented Dickey-Fuller statistic =  -3.5426
 LL  = Maximized log-likelihood      AIC = Akaike Information Criterion
 SBC = Schwarz Bayesian Criterion    HQC = Hannan-Quinn Criterion
```

Unit root tests for variable LRYWORLD

The Dickey-Fuller regressions include an intercept but not a trend

****

35 observations used in the estimation of all ADF regressions.

Sample period from 1966 to 2000

****

	Test Statistic	LL	AIC	SBC	HQC
DF	-.76028	69.3584	67.3584	65.8030	66.8214
ADF(1)	-.68394	69.6635	66.6635	64.3305	65.8581
ADF(2)	-.97759	71.6731	67.6731	64.5624	66.5993
ADF(3)	-.86799	71.7028	66.7028	62.8145	65.3606
ADF(4)	-.71866	71.7347	65.7347	61.0687	64.1240
ADF(5)	-.77234	71.7973	64.7973	59.3536	62.9181

****

95% critical value for the augmented Dickey-Fuller statistic = -2.9472

LL = Maximized log-likelihood AIC = Akaike Information Criterion

SBC = Schwarz Bayesian Criterion HQC = Hannan-Quinn Criterion

Unit root tests for variable LRYWORLD

The Dickey-Fuller regressions include an intercept and a linear trend

****

35 observations used in the estimation of all ADF regressions.

Sample period from 1966 to 2000

****

	Test Statistic	LL	AIC	SBC	HQC
DF	-2.5931	72.4258	69.4258	67.0928	68.6205
ADF(1)	-2.9174	73.6653	69.6653	66.5546	68.5915
ADF(2)	-2.5845	74.7950	69.7950	65.9066	68.4527
ADF(3)	-2.5558	74.9030	68.9030	64.2370	67.2923
ADF(4)	-2.4960	74.9650	67.9650	62.5212	66.0858
ADF(5)	-2.4507	74.9763	66.9763	60.7549	64.8286

****

95% critical value for the augmented Dickey-Fuller statistic = -3.5426

LL = Maximized log-likelihood AIC = Akaike Information Criterion

SBC = Schwarz Bayesian Criterion HQC = Hannan-Quinn Criterion

Unit root tests for variable DLRYAVUS

The Dickey-Fuller regressions include an intercept but not a trend

****

34 observations used in the estimation of all ADF regressions.

Sample period from 1967 to 2000

****

	Test Statistic	LL	AIC	SBC	HQC
DF	-4.2113	65.6067	63.6067	62.0804	63.0862
ADF(1)	-3.6582	65.7780	62.7780	60.4885	61.9972
ADF(2)	-3.0389	65.7947	61.7947	58.7419	60.7536
ADF(3)	-2.6556	65.8219	60.8219	57.0060	59.5206
ADF(4)	-2.1441	65.9172	59.9172	55.3381	58.3556
ADF(5)	-2.0065	65.9455	58.9455	53.6032	57.1236

****

95% critical value for the augmented Dickey-Fuller statistic = -2.9499

LL = Maximized log-likelihood AIC = Akaike Information Criterion

SBC = Schwarz Bayesian Criterion HQC = Hannan-Quinn Criterion

Unit root tests for variable DLRYAVUS

The Dickey-Fuller regressions include an intercept and a linear trend

****

34 observations used in the estimation of all ADF regressions.

Sample period from 1967 to 2000

****

	Test Statistic	LL	AIC	SBC	HQC
DF	-4.1453	65.6436	62.6436	60.3541	61.8628
ADF(1)	-3.6032	65.8400	61.8400	58.7873	60.7989
ADF(2)	-2.9644	65.8838	60.8838	57.0679	59.5825
ADF(3)	-2.5663	65.9633	59.9633	55.3842	58.4017
ADF(4)	-2.0090	66.0072	59.0072	53.6649	57.1853
ADF(5)	-1.8766	66.0945	58.0945	51.9890	56.0124

****

95% critical value for the augmented Dickey-Fuller statistic = -3.5468

LL = Maximized log-likelihood AIC = Akaike Information Criterion

SBC = Schwarz Bayesian Criterion HQC = Hannan-Quinn Criterion

```
               Unit root tests for variable DLRYBL
     The Dickey-Fuller regressions include an intercept but not a trend
*******************************************************************************
 34 observations used in the estimation of all ADF regressions.
 Sample period from 1967 to 2000
*******************************************************************************
        Test Statistic      LL           AIC           SBC           HQC
 DF          -6.2222       61.9053       59.9053       58.3790       59.3848
 ADF(1)      -3.9458       61.9053       58.9053       56.6158       58.1245
 ADF(2)      -3.3805       61.9731       57.9731       54.9204       56.9320
 ADF(3)      -2.8848       61.9733       56.9733       53.1574       55.6719
 ADF(4)      -2.1678       62.6784       56.6784       52.0993       55.1168
 ADF(5)      -2.0934       62.7019       55.7019       50.3597       53.8801
*******************************************************************************
 95% critical value for the augmented Dickey-Fuller statistic =  -2.9499
 LL  = Maximized log-likelihood      AIC = Akaike Information Criterion
 SBC = Schwarz Bayesian Criterion    HQC = Hannan-Quinn Criterion
```

```
                     Unit root tests for variable DLRYBL
    The Dickey-Fuller regressions include an intercept and a linear trend
*******************************************************************************
 34 observations used in the estimation of all ADF regressions.
 Sample period from 1967 to 2000
*******************************************************************************
        Test Statistic      LL           AIC           SBC           HQC
 DF          -6.2303       62.2326       59.2326       56.9430       58.4518
 ADF(1)      -3.9806       62.2585       58.2585       55.2058       57.2175
 ADF(2)      -3.4582       62.4417       57.4417       53.6258       56.1404
 ADF(3)      -2.9742       62.5161       56.5161       51.9370       54.9545
 ADF(4)      -2.0715       62.8896       55.8896       50.5473       54.0677
 ADF(5)      -2.0226       63.0602       55.0602       48.9547       52.9780
*******************************************************************************
 95% critical value for the augmented Dickey-Fuller statistic =  -3.5468
 LL  = Maximized log-likelihood      AIC = Akaike Information Criterion
 SBC = Schwarz Bayesian Criterion    HQC = Hannan-Quinn Criterion
```

Unit root tests for variable DLRYENG

The Dickey-Fuller regressions include an intercept but not a trend

****

34 observations used in the estimation of all ADF regressions.

Sample period from 1967 to 2000

****

	Test Statistic	LL	AIC	SBC	HQC
DF	-4.9003	68.8831	66.8831	65.3567	66.3626
ADF(1)	-5.5097	71.7027	68.7027	66.4132	67.9219
ADF(2)	-4.5308	72.0260	68.0260	64.9733	66.9849
ADF(3)	-3.5790	72.0318	67.0318	63.2159	65.7304
ADF(4)	-2.8369	72.0925	66.0925	61.5134	64.5309
ADF(5)	-2.5135	72.0934	65.0934	59.7511	63.2715

****

95% critical value for the augmented Dickey-Fuller statistic = -2.9499

LL = Maximized log-likelihood AIC = Akaike Information Criterion

SBC = Schwarz Bayesian Criterion HQC = Hannan-Quinn Criterion

Unit root tests for variable DLRYENG

The Dickey-Fuller regressions include an intercept and a linear trend

****

34 observations used in the estimation of all ADF regressions.

Sample period from 1967 to 2000

****

	Test Statistic	LL	AIC	SBC	HQC
DF	-4.8396	68.9328	65.9328	63.6433	65.1520
ADF(1)	-5.4583	71.8213	67.8213	64.7686	66.7802
ADF(2)	-4.5152	72.2286	67.2286	63.4127	65.9272
ADF(3)	-3.5804	72.2540	66.2540	61.6749	64.6924
ADF(4)	-2.8355	72.2807	65.2807	59.9384	63.4588
ADF(5)	-2.5195	72.2918	64.2918	58.1864	62.2097

****

95% critical value for the augmented Dickey-Fuller statistic = -3.5468

LL = Maximized log-likelihood AIC = Akaike Information Criterion

SBC = Schwarz Bayesian Criterion HQC = Hannan-Quinn Criterion

```
                    Unit root tests for variable DLRYFRA
     The Dickey-Fuller regressions include an intercept but not a trend
*******************************************************************************
 34 observations used in the estimation of all ADF regressions.
 Sample period from 1967 to 2000
*******************************************************************************
        Test Statistic      LL           AIC           SBC           HQC
 DF         -4.5630       69.3085       67.3085       65.7822       66.7880
 ADF(1)     -3.1616       69.4999       66.4999       64.2103       65.7191
 ADF(2)     -2.3846       69.8422       65.8422       62.7895       64.8011
 ADF(3)     -2.5070       70.2294       65.2294       61.4135       63.9280
 ADF(4)     -2.0700       70.4726       64.4726       59.8935       62.9110
 ADF(5)     -1.9250       70.4730       63.4730       58.1308       61.6512
*******************************************************************************
 95% critical value for the augmented Dickey-Fuller statistic =  -2.9499
 LL  = Maximized log-likelihood      AIC = Akaike Information Criterion
 SBC = Schwarz Bayesian Criterion    HQC = Hannan-Quinn Criterion
```

```
                    Unit root tests for variable DLRYFRA
    The Dickey-Fuller regressions include an intercept and a linear trend
*******************************************************************************
 34 observations used in the estimation of all ADF regressions.
 Sample period from 1967 to 2000
*******************************************************************************
        Test Statistic      LL           AIC           SBC           HQC
 DF         -4.7404       70.0995       67.0995       64.8100       66.3187
 ADF(1)     -3.3602       70.1850       66.1850       63.1323       65.1440
 ADF(2)     -2.5053       70.2875       65.2875       61.4716       63.9862
 ADF(3)     -2.8507       71.2983       65.2983       60.7192       63.7367
 ADF(4)     -2.3154       71.3003       64.3003       58.9580       62.4784
 ADF(5)     -2.2310       71.4776       63.4776       57.3722       61.3955
*******************************************************************************
 95% critical value for the augmented Dickey-Fuller statistic =  -3.5468
 LL  = Maximized log-likelihood      AIC = Akaike Information Criterion
 SBC = Schwarz Bayesian Criterion    HQC = Hannan-Quinn Criterion
```

Unit root tests for variable DLRYGER

The Dickey-Fuller regressions include an intercept but not a trend

****

34 observations used in the estimation of all ADF regressions.

Sample period from 1967 to 2000

	Test Statistic	LL	AIC	SBC	HQC
DF	-4.4565	62.3617	60.3617	58.8353	59.8411
ADF(1)	-4.5992	63.7625	60.7625	58.4730	59.9817
ADF(2)	-3.2724	63.8609	59.8609	56.8082	58.8198
ADF(3)	-2.7403	63.8658	58.8658	55.0499	57.5645
ADF(4)	-2.6968	64.0533	58.0533	53.4743	56.4917
ADF(5)	-2.4060	64.0550	57.0550	51.7127	55.2331

95% critical value for the augmented Dickey-Fuller statistic = -2.9499

LL = Maximized log-likelihood AIC = Akaike Information Criterion

SBC = Schwarz Bayesian Criterion HQC = Hannan-Quinn Criterion

Unit root tests for variable DLRYGER

The Dickey-Fuller regressions include an intercept and a linear trend

****

34 observations used in the estimation of all ADF regressions.

Sample period from 1967 to 2000

	Test Statistic	LL	AIC	SBC	HQC
DF	-4.4680	62.6152	59.6152	57.3256	58.8344
ADF(1)	-4.7148	64.3619	60.3619	57.3091	59.3208
ADF(2)	-3.3616	64.3657	59.3657	55.5498	58.0644
ADF(3)	-2.8341	64.3986	58.3986	53.8195	56.8370
ADF(4)	-2.9137	64.9606	57.9606	52.6183	56.1387
ADF(5)	-2.6685	65.1080	57.1080	51.0026	55.0259

95% critical value for the augmented Dickey-Fuller statistic = -3.5468

LL = Maximized log-likelihood AIC = Akaike Information Criterion

SBC = Schwarz Bayesian Criterion HQC = Hannan-Quinn Criterion

```
                    Unit root tests for variable DLRYHOL
      The Dickey-Fuller regressions include an intercept but not a trend
*******************************************************************************
 34 observations used in the estimation of all ADF regressions.
 Sample period from 1967 to 2000
*******************************************************************************
        Test Statistic      LL          AIC          SBC          HQC
 DF         -4.1310       72.6474      70.6474      69.1210      70.1269
 ADF(1)     -2.8699       72.9380      69.9380      67.6485      69.1572
 ADF(2)     -2.4117       73.4092      69.4092      66.3565      68.3682
 ADF(3)     -2.0611       73.9026      68.9026      65.0867      67.6013
 ADF(4)     -1.8507       74.2388      68.2388      63.6597      66.6772
 ADF(5)     -1.5678       75.9175      68.9175      63.5752      67.0956
*******************************************************************************
 95% critical value for the augmented Dickey-Fuller statistic =  -2.9499
 LL  = Maximized log-likelihood      AIC = Akaike Information Criterion
 SBC = Schwarz Bayesian Criterion    HQC = Hannan-Quinn Criterion


                    Unit root tests for variable DLRYHOL
     The Dickey-Fuller regressions include an intercept and a linear trend
*******************************************************************************
 34 observations used in the estimation of all ADF regressions.
 Sample period from 1967 to 2000
*******************************************************************************
        Test Statistic      LL          AIC          SBC          HQC
 DF         -4.5809       74.1724      71.1724      68.8829      70.3916
 ADF(1)     -3.3084       74.2204      70.2204      67.1677      69.1793
 ADF(2)     -2.7223       74.3097      69.3097      65.4938      68.0084
 ADF(3)     -2.2224       74.4733      68.4733      63.8942      66.9117
 ADF(4)     -1.8646       74.5884      67.5884      62.2462      65.7666
 ADF(5)     -1.2333       75.9471      67.9471      61.8417      65.8650
*******************************************************************************
 95% critical value for the augmented Dickey-Fuller statistic =  -3.5468
 LL  = Maximized log-likelihood      AIC = Akaike Information Criterion
 SBC = Schwarz Bayesian Criterion    HQC = Hannan-Quinn Criterion
```

Unit root tests for variable DLRYSWIS

The Dickey-Fuller regressions include an intercept but not a trend

****

34 observations used in the estimation of all ADF regressions.

Sample period from 1967 to 2000

****

	Test Statistic	LL	AIC	SBC	HQC
DF	-4.3188	61.6562	59.6562	58.1298	59.1357
ADF(1)	-4.2196	62.5084	59.5084	57.2188	58.7276
ADF(2)	-2.4706	63.8124	59.8124	56.7597	58.7713
ADF(3)	-2.3927	63.9091	58.9091	55.0932	57.6077
ADF(4)	-2.6701	64.7272	58.7272	54.1481	57.1656
ADF(5)	-2.2410	64.7718	57.7718	52.4295	55.9499

****

95% critical value for the augmented Dickey-Fuller statistic = -2.9499

LL = Maximized log-likelihood AIC = Akaike Information Criterion

SBC = Schwarz Bayesian Criterion HQC = Hannan-Quinn Criterion

Unit root tests for variable DLRYSWIS

The Dickey-Fuller regressions include an intercept and a linear trend

****

34 observations used in the estimation of all ADF regressions.

Sample period from 1967 to 2000

****

	Test Statistic	LL	AIC	SBC	HQC
DF	-4.2224	61.6626	58.6626	56.3731	57.8818
ADF(1)	-4.1062	62.5121	58.5121	55.4594	57.4711
ADF(2)	-2.2853	63.8466	58.8466	55.0307	57.5453
ADF(3)	-2.1626	63.9207	57.9207	53.3416	56.3591
ADF(4)	-2.4593	64.7408	57.7408	52.3986	55.9190
ADF(5)	-1.9731	64.7756	56.7756	50.6701	54.6934

****

95% critical value for the augmented Dickey-Fuller statistic = -3.5468

LL = Maximized log-likelihood AIC = Akaike Information Criterion

SBC = Schwarz Bayesian Criterion HQC = Hannan-Quinn Criterion

```
                    Unit root tests for variable DLRYUSA
     The Dickey-Fuller regressions include an intercept but not a trend
*******************************************************************************
 34 observations used in the estimation of all ADF regressions.
 Sample period from 1967 to 2000
*******************************************************************************
        Test Statistic      LL           AIC           SBC           HQC
 DF          -5.0707       61.6307       59.6307       58.1043       59.1102
 ADF(1)      -5.7072       64.4231       61.4231       59.1335       60.6423
 ADF(2)      -4.2578       64.4390       60.4390       57.3863       59.3979
 ADF(3)      -3.5759       64.4468       59.4468       55.6309       58.1454
 ADF(4)      -2.9622       64.6536       58.6536       54.0745       57.0920
 ADF(5)      -2.9434       64.9226       57.9226       52.5804       56.1008
*******************************************************************************
 95% critical value for the augmented Dickey-Fuller statistic =  -2.9499
 LL  = Maximized log-likelihood      AIC = Akaike Information Criterion
 SBC = Schwarz Bayesian Criterion    HQC = Hannan-Quinn Criterion


                    Unit root tests for variable DLRYUSA
    The Dickey-Fuller regressions include an intercept and a linear trend
*******************************************************************************
 34 observations used in the estimation of all ADF regressions.
 Sample period from 1967 to 2000
*******************************************************************************
        Test Statistic      LL           AIC           SBC           HQC
 DF          -5.0636       61.9338       58.9338       56.6443       58.1530
 ADF(1)      -5.6544       64.6699       60.6699       57.6172       59.6288
 ADF(2)      -4.1644       64.6762       59.6762       55.8603       58.3749
 ADF(3)      -3.3867       64.6763       58.6763       54.0972       57.1147
 ADF(4)      -2.6264       65.0494       58.0494       52.7072       56.2276
 ADF(5)      -2.4921       65.1769       57.1769       51.0714       55.0947
*******************************************************************************
 95% critical value for the augmented Dickey-Fuller statistic =  -3.5468
 LL  = Maximized log-likelihood      AIC = Akaike Information Criterion
 SBC = Schwarz Bayesian Criterion    HQC = Hannan-Quinn Criterion
```

```
                    Unit root tests for variable DLRYTUR
     The Dickey-Fuller regressions include an intercept but not a trend
*******************************************************************************
 34 observations used in the estimation of all ADF regressions.
 Sample period from 1967 to 2000
*******************************************************************************
        Test Statistic      LL            AIC           SBC           HQC
 DF          -6.3347       62.5618       60.5618       59.0355       60.0413
 ADF(1)      -4.6425       62.8741       59.8741       57.5846       59.0933
 ADF(2)      -3.0930       63.0140       59.0140       55.9612       57.9729
 ADF(3)      -3.4517       64.1901       59.1901       55.3742       57.8888
 ADF(4)      -2.1255       66.7650       60.7650       56.1859       59.2034
 ADF(5)      -2.1739       66.9773       59.9773       54.6350       58.1554
*******************************************************************************
 95% critical value for the augmented Dickey-Fuller statistic =  -2.9499
 LL  = Maximized log-likelihood      AIC = Akaike Information Criterion
 SBC = Schwarz Bayesian Criterion    HQC = Hannan-Quinn Criterion


                    Unit root tests for variable DLRYTUR
    The Dickey-Fuller regressions include an intercept and a linear trend
*******************************************************************************
 34 observations used in the estimation of all ADF regressions.
 Sample period from 1967 to 2000
*******************************************************************************
        Test Statistic      LL            AIC           SBC           HQC
 DF          -6.3276       62.9481       59.9481       57.6585       59.1673
 ADF(1)      -4.7204       63.3543       59.3543       56.3016       58.3133
 ADF(2)      -3.1976       63.4446       58.4446       54.6287       57.1433
 ADF(3)      -3.6537       64.9681       58.9681       54.3891       57.4065
 ADF(4)      -2.1433       66.9590       59.9590       54.6168       58.1372
 ADF(5)      -2.2380       67.3001       59.3001       53.1946       57.2180
*******************************************************************************
 95% critical value for the augmented Dickey-Fuller statistic =  -3.5468
 LL  = Maximized log-likelihood      AIC = Akaike Information Criterion
 SBC = Schwarz Bayesian Criterion    HQC = Hannan-Quinn Criterion
```

```
                    Unit root tests for variable DLWORLD
     The Dickey-Fuller regressions include an intercept but not a trend
*******************************************************************************
 34 observations used in the estimation of all ADF regressions.
 Sample period from 1967 to 2000
*******************************************************************************
        Test Statistic      LL           AIC          SBC           HQC
 DF         -4.9890       67.0215       65.0215       63.4951       64.5009
 ADF(1)     -5.2237       68.9621       65.9621       63.6726       65.1813
 ADF(2)     -3.6518       69.0482       65.0482       61.9955       64.0071
 ADF(3)     -2.9124       69.1330       64.1330       60.3171       62.8316
 ADF(4)     -2.6841       69.1343       63.1343       58.5552       61.5727
 ADF(5)     -2.6154       69.2383       62.2383       56.8960       60.4164
*******************************************************************************
 95% critical value for the augmented Dickey-Fuller statistic =  -2.9499
 LL  = Maximized log-likelihood      AIC = Akaike Information Criterion
 SBC = Schwarz Bayesian Criterion    HQC = Hannan-Quinn Criterion
```

```
                    Unit root tests for variable DLWORLD
    The Dickey-Fuller regressions include an intercept and a linear trend
*******************************************************************************
 34 observations used in the estimation of all ADF regressions.
 Sample period from 1967 to 2000
*******************************************************************************
        Test Statistic      LL           AIC          SBC           HQC
 DF         -4.8963       67.0219       64.0219       61.7324       63.2411
 ADF(1)     -5.1322       69.0158       65.0158       61.9631       63.9747
 ADF(2)     -3.5039       69.0744       64.0744       60.2585       62.7730
 ADF(3)     -2.6548       69.1382       63.1382       58.5591       61.5766
 ADF(4)     -2.3416       69.1425       62.1425       56.8003       60.3207
 ADF(5)     -2.2466       69.2918       61.2918       55.1864       59.2097
*******************************************************************************
 95% critical value for the augmented Dickey-Fuller statistic =  -3.5468
 LL  = Maximized log-likelihood      AIC = Akaike Information Criterion
 SBC = Schwarz Bayesian Criterion    HQC = Hannan-Quinn Criterion
```

```
                    Unit root tests for variable LRERAVUS
      The Dickey-Fuller regressions include an intercept but not a trend
*******************************************************************************
 35 observations used in the estimation of all ADF regressions.
 Sample period from 1966 to 2000
*******************************************************************************
        Test Statistic      LL          AIC          SBC          HQC
 DF          5.3448      -9.6808     -11.6808     -13.2361     -12.2177
 ADF(1)      1.4652      -5.7172      -8.7172     -11.0503      -9.5226
 ADF(2)      .73619      -5.3326      -9.3326     -12.4433     -10.4065
 ADF(3)      .49202      -5.2863     -10.2863     -14.1747     -11.6286
 ADF(4)      .43101      -5.2862     -11.2862     -15.9523     -12.8969
 ADF(5)      .32485      -5.2813     -12.2813     -17.7250     -14.1604
*******************************************************************************
 95% critical value for the augmented Dickey-Fuller statistic =  -2.9472
 LL  = Maximized log-likelihood      AIC = Akaike Information Criterion
 SBC = Schwarz Bayesian Criterion    HQC = Hannan-Quinn Criterion
```

```
                    Unit root tests for variable LRERAVUS
     The Dickey-Fuller regressions include an intercept and a linear trend
*******************************************************************************
 35 observations used in the estimation of all ADF regressions.
 Sample period from 1966 to 2000
*******************************************************************************
        Test Statistic      LL          AIC          SBC          HQC
 DF         -2.3098      -2.3556      -5.3556      -7.6886      -6.1610
 ADF(1)     -2.1306      -1.1526      -5.1526      -8.2633      -6.2264
 ADF(2)     -2.0968      -1.1498      -6.1498     -10.0381      -7.4920
 ADF(3)     -2.0434      -1.0442      -7.0442     -11.7102      -8.6549
 ADF(4)     -1.9709      -.61851      -7.6185     -13.0622      -9.4977
 ADF(5)     -1.8511      -.13291      -8.1329     -14.3543     -10.2805
*******************************************************************************
 95% critical value for the augmented Dickey-Fuller statistic =  -3.5426
 LL  = Maximized log-likelihood      AIC = Akaike Information Criterion
 SBC = Schwarz Bayesian Criterion    HQC = Hannan-Quinn Criterion
```

```
                    Unit root tests for variable LRERBL
      The Dickey-Fuller regressions include an intercept but not a trend
*******************************************************************************
 35 observations used in the estimation of all ADF regressions.
 Sample period from 1966 to 2000
*******************************************************************************
        Test Statistic      LL            AIC           SBC           HQC
 DF          5.3137      -10.7588      -12.7588      -14.3141      -13.2957
 ADF(1)      1.5647       -7.3052      -10.3052      -12.6383      -11.1106
 ADF(2)      .92185       -7.0992      -11.0992      -14.2099      -12.1731
 ADF(3)      .68372       -7.0792      -12.0792      -15.9676      -13.4215
 ADF(4)      .61719       -7.0761      -13.0761      -17.7421      -14.6868
 ADF(5)      .46022       -7.0687      -14.0687      -19.5124      -15.9479
*******************************************************************************
 95% critical value for the augmented Dickey-Fuller statistic =  -2.9472
 LL  = Maximized log-likelihood      AIC = Akaike Information Criterion
 SBC = Schwarz Bayesian Criterion    HQC = Hannan-Quinn Criterion
```

```
                    Unit root tests for variable LRERBL
     The Dickey-Fuller regressions include an intercept and a linear trend
*******************************************************************************
 35 observations used in the estimation of all ADF regressions.
 Sample period from 1966 to 2000
*******************************************************************************
        Test Statistic      LL            AIC           SBC           HQC
 DF         -1.9610       -4.2651       -7.2651       -9.5981       -8.0704
 ADF(1)     -1.8923       -3.0692       -7.0692      -10.1799       -8.1430
 ADF(2)     -1.8524       -3.0663       -8.0663      -11.9547       -9.4086
 ADF(3)     -1.7676       -2.9287       -8.9287      -13.5947      -10.5394
 ADF(4)     -1.6223       -2.4692       -9.4692      -14.9129      -11.3484
 ADF(5)     -1.4219       -1.9012       -9.9012      -16.1226      -12.0489
*******************************************************************************
 95% critical value for the augmented Dickey-Fuller statistic =  -3.5426
 LL  = Maximized log-likelihood      AIC = Akaike Information Criterion
 SBC = Schwarz Bayesian Criterion    HQC = Hannan-Quinn Criterion
```

```
                    Unit root tests for variable LRERENG
     The Dickey-Fuller regressions include an intercept but not a trend
*******************************************************************************
 35 observations used in the estimation of all ADF regressions.
 Sample period from 1966 to 2000
*******************************************************************************
        Test Statistic      LL           AIC           SBC           HQC
 DF          5.3049      -13.7935      -15.7935      -17.3488      -16.3304
 ADF(1)      1.6034      -10.3378      -13.3378      -15.6709      -14.1432
 ADF(2)      1.0289      -10.1744      -14.1744      -17.2851      -15.2482
 ADF(3)      .61346      -10.0419      -15.0419      -18.9303      -16.3842
 ADF(4)      1.0065       -9.4686      -15.4686      -20.1346      -17.0793
 ADF(5)      .64811       -9.3422      -16.3422      -21.7859      -18.2214
*******************************************************************************
 95% critical value for the augmented Dickey-Fuller statistic =  -2.9472
 LL  = Maximized log-likelihood      AIC = Akaike Information Criterion
 SBC = Schwarz Bayesian Criterion    HQC = Hannan-Quinn Criterion
```

```
                    Unit root tests for variable LRERENG
    The Dickey-Fuller regressions include an intercept and a linear trend
*******************************************************************************
 35 observations used in the estimation of all ADF regressions.
 Sample period from 1966 to 2000
*******************************************************************************
        Test Statistic      LL           AIC           SBC           HQC
 DF         -1.5028       -7.6949      -10.6949      -13.0279      -11.5003
 ADF(1)     -1.5757       -6.2996      -10.2996      -13.4103      -11.3734
 ADF(2)     -1.5336       -6.2996      -11.2996      -15.1879      -12.6418
 ADF(3)     -1.4756       -6.2996      -12.2996      -16.9656      -13.9103
 ADF(4)     -1.1007       -4.7285      -11.7285      -17.1723      -13.6077
 ADF(5)     -.96893       -4.6268      -12.6268      -18.8482      -14.7745
*******************************************************************************
 95% critical value for the augmented Dickey-Fuller statistic =  -3.5426
 LL  = Maximized log-likelihood      AIC = Akaike Information Criterion
 SBC = Schwarz Bayesian Criterion    HQC = Hannan-Quinn Criterion
```

```
                    Unit root tests for variable LRERFRA
      The Dickey-Fuller regressions include an intercept but not a trend
*******************************************************************************
 35 observations used in the estimation of all ADF regressions.
 Sample period from 1966 to 2000
*******************************************************************************
        Test Statistic      LL          AIC          SBC          HQC
 DF          5.5474      -10.7973     -12.7973     -14.3527     -13.3342
 ADF(1)      1.6956       -7.7901     -10.7901     -13.1231     -11.5955
 ADF(2)      .90264       -7.4646     -11.4646     -14.5753     -12.5384
 ADF(3)      .63178       -7.4335     -12.4335     -16.3219     -13.7758
 ADF(4)      .61161       -7.4192     -13.4192     -18.0853     -15.0300
 ADF(5)     .088197       -7.0388     -14.0388     -19.4825     -15.9180
*******************************************************************************
 95% critical value for the augmented Dickey-Fuller statistic =  -2.9472
 LL  = Maximized log-likelihood      AIC = Akaike Information Criterion
 SBC = Schwarz Bayesian Criterion    HQC = Hannan-Quinn Criterion


                    Unit root tests for variable LRERFRA
     The Dickey-Fuller regressions include an intercept and a linear trend
*******************************************************************************
 35 observations used in the estimation of all ADF regressions.
 Sample period from 1966 to 2000
*******************************************************************************
        Test Statistic      LL          AIC          SBC          HQC
 DF         -1.6728       -4.3848      -7.3848      -9.7179      -8.1902
 ADF(1)     -1.6780       -3.4667      -7.4667     -10.5774      -8.5405
 ADF(2)     -1.6467       -3.4639      -8.4639     -12.3523      -9.8062
 ADF(3)     -1.5247       -3.3452      -9.3452     -14.0112     -10.9559
 ADF(4)     -1.2775       -2.7357      -9.7357     -15.1794     -11.6148
 ADF(5)     -1.1410       -2.7007     -10.7007     -16.9221     -12.8484
*******************************************************************************
 95% critical value for the augmented Dickey-Fuller statistic =  -3.5426
 LL  = Maximized log-likelihood      AIC = Akaike Information Criterion
 SBC = Schwarz Bayesian Criterion    HQC = Hannan-Quinn Criterion
```

```
                    Unit root tests for variable LRERGER
      The Dickey-Fuller regressions include an intercept but not a trend
*******************************************************************************
 35 observations used in the estimation of all ADF regressions.
 Sample period from 1966 to 2000
*******************************************************************************
        Test Statistic      LL            AIC           SBC           HQC
 DF          5.3432       -9.1365      -11.1365      -12.6918      -11.6734
 ADF(1)      1.5324       -5.4908       -8.4908      -10.8239       -9.2962
 ADF(2)      .77600       -5.0983       -9.0983      -12.2090      -10.1721
 ADF(3)      .48061       -5.0187      -10.0187      -13.9071      -11.3610
 ADF(4)      .43563       -5.0177      -11.0177      -15.6837      -12.6284
 ADF(5)      .38556       -5.0173      -12.0173      -17.4610      -13.8964
*******************************************************************************
 95% critical value for the augmented Dickey-Fuller statistic =  -2.9472
 LL  = Maximized log-likelihood      AIC = Akaike Information Criterion
 SBC = Schwarz Bayesian Criterion    HQC = Hannan-Quinn Criterion
```

```
                    Unit root tests for variable LRERGER
     The Dickey-Fuller regressions include an intercept and a linear trend
*******************************************************************************
 35 observations used in the estimation of all ADF regressions.
 Sample period from 1966 to 2000
*******************************************************************************
        Test Statistic      LL            AIC           SBC           HQC
 DF         -2.3264       -1.9542       -4.9542       -7.2872       -5.7596
 ADF(1)     -2.1462       -.89870       -4.8987       -8.0094       -5.9725
 ADF(2)     -2.1117       -.89584       -5.8958       -9.7842       -7.2381
 ADF(3)     -2.0653       -.82641       -6.8264      -11.4925       -8.4371
 ADF(4)     -1.9978       -.37509       -7.3751      -12.8188       -9.2543
 ADF(5)     -1.9048        .36334       -7.6367      -13.8580       -9.7843
*******************************************************************************
 95% critical value for the augmented Dickey-Fuller statistic =  -3.5426
 LL  = Maximized log-likelihood      AIC = Akaike Information Criterion
 SBC = Schwarz Bayesian Criterion    HQC = Hannan-Quinn Criterion
```

```
                    Unit root tests for variable LRERHOL
     The Dickey-Fuller regressions include an intercept but not a trend
*******************************************************************************
 35 observations used in the estimation of all ADF regressions.
 Sample period from 1966 to 2000
*******************************************************************************
        Test Statistic      LL           AIC           SBC           HQC
 DF           5.3166     -10.5295      -12.5295      -14.0849      -13.0664
 ADF(1)       1.4560      -6.5065       -9.5065      -11.8395      -10.3119
 ADF(2)       .63864      -5.9484       -9.9484      -13.0591      -11.0222
 ADF(3)       .40419      -5.8982      -10.8982      -14.7865      -12.2404
 ADF(4)       .33963      -5.8979      -11.8979      -16.5640      -13.5086
 ADF(5)       .17381      -5.8631      -12.8631      -18.3068      -14.7423
*******************************************************************************
 95% critical value for the augmented Dickey-Fuller statistic =  -2.9472
 LL  = Maximized log-likelihood      AIC = Akaike Information Criterion
 SBC = Schwarz Bayesian Criterion    HQC = Hannan-Quinn Criterion


                    Unit root tests for variable LRERHOL
    The Dickey-Fuller regressions include an intercept and a linear trend
*******************************************************************************
 35 observations used in the estimation of all ADF regressions.
 Sample period from 1966 to 2000
*******************************************************************************
        Test Statistic      LL           AIC           SBC           HQC
 DF          -2.3456      -2.8323       -5.8323       -8.1653       -6.6376
 ADF(1)      -2.1569      -1.7453       -5.7453       -8.8560       -6.8191
 ADF(2)      -2.1235      -1.7260       -6.7260      -10.6144       -8.0683
 ADF(3)      -2.0673      -1.6142       -7.6142      -12.2802       -9.2249
 ADF(4)      -1.9805      -1.2148       -8.2148      -13.6585      -10.0940
 ADF(5)      -1.8614      -.84706       -8.8471      -15.0685      -10.9947
*******************************************************************************
 95% critical value for the augmented Dickey-Fuller statistic =  -3.5426
 LL  = Maximized log-likelihood      AIC = Akaike Information Criterion
 SBC = Schwarz Bayesian Criterion    HQC = Hannan-Quinn Criterion
```

Unit root tests for variable LRERITA

The Dickey-Fuller regressions include an intercept but not a trend

****

35 observations used in the estimation of all ADF regressions.

Sample period from 1966 to 2000

****

	Test Statistic	LL	AIC	SBC	HQC
DF	5.5646	-10.5047	-12.5047	-14.0600	-13.0416
ADF(1)	1.7998	-7.8532	-10.8532	-13.1863	-11.6586
ADF(2)	.92306	-7.4428	-11.4428	-14.5535	-12.5166
ADF(3)	.78461	-7.4424	-12.4424	-16.3308	-13.7847
ADF(4)	1.0318	-7.1442	-13.1442	-17.8103	-14.7549
ADF(5)	.57345	-6.9571	-13.9571	-19.4009	-15.8363

****

95% critical value for the augmented Dickey-Fuller statistic = -2.9472

LL = Maximized log-likelihood AIC = Akaike Information Criterion

SBC = Schwarz Bayesian Criterion HQC = Hannan-Quinn Criterion

Unit root tests for variable LRERITA

The Dickey-Fuller regressions include an intercept and a linear trend

****

35 observations used in the estimation of all ADF regressions.

Sample period from 1966 to 2000

****

	Test Statistic	LL	AIC	SBC	HQC
DF	-1.1098	-5.2780	-8.2780	-10.6111	-9.0834
ADF(1)	-1.2443	-4.2177	-8.2177	-11.3284	-9.2915
ADF(2)	-1.2715	-4.1475	-9.1475	-13.0359	-10.4898
ADF(3)	-1.0902	-3.9887	-9.9887	-14.6548	-11.5994
ADF(4)	-.65876	-2.8023	-9.8023	-15.2460	-11.6815
ADF(5)	-.50380	-2.7282	-10.7282	-16.9496	-12.8758

****

95% critical value for the augmented Dickey-Fuller statistic = -3.5426

LL = Maximized log-likelihood AIC = Akaike Information Criterion

SBC = Schwarz Bayesian Criterion HQC = Hannan-Quinn Criterion

```
                    Unit root tests for variable LRERSWIS
     The Dickey-Fuller regressions include an intercept but not a trend
*******************************************************************************
 35 observations used in the estimation of all ADF regressions.
 Sample period from 1966 to 2000
*******************************************************************************
        Test Statistic      LL          AIC          SBC          HQC
 DF           5.2903      -9.9463     -11.9463     -13.5017     -12.4832
 ADF(1)       1.6284      -6.4527      -9.4527     -11.7857     -10.2581
 ADF(2)       .81054      -5.9502      -9.9502     -13.0609     -11.0240
 ADF(3)       .48531      -5.8393     -10.8393     -14.7277     -12.1816
 ADF(4)       .43137      -5.8393     -11.8393     -16.5053     -13.4500
 ADF(5)       .53785      -5.7648     -12.7648     -18.2086     -14.6440
*******************************************************************************
 95% critical value for the augmented Dickey-Fuller statistic =  -2.9472
 LL  = Maximized log-likelihood      AIC = Akaike Information Criterion
 SBC = Schwarz Bayesian Criterion    HQC = Hannan-Quinn Criterion


                    Unit root tests for variable LRERSWIS
    The Dickey-Fuller regressions include an intercept and a linear trend
*******************************************************************************
 35 observations used in the estimation of all ADF regressions.
 Sample period from 1966 to 2000
*******************************************************************************
        Test Statistic      LL          AIC          SBC          HQC
 DF          -2.4578      -2.5219      -5.5219      -7.8549      -6.3272
 ADF(1)      -2.2505      -1.5868      -5.5868      -8.6975      -6.6606
 ADF(2)      -2.2122      -1.5671      -6.5671     -10.4554      -7.9093
 ADF(3)      -2.1691      -1.5357      -7.5357     -12.2018      -9.1465
 ADF(4)      -2.1179      -1.2160      -8.2160     -13.6598     -10.0952
 ADF(5)      -2.0599     -.078442      -8.0784     -14.2998     -10.2261
*******************************************************************************
 95% critical value for the augmented Dickey-Fuller statistic =  -3.5426
 LL  = Maximized log-likelihood      AIC = Akaike Information Criterion
 SBC = Schwarz Bayesian Criterion    HQC = Hannan-Quinn Criterion
```

Unit root tests for variable LRERUSA

The Dickey-Fuller regressions include an intercept but not a trend

****

35 observations used in the estimation of all ADF regressions.

Sample period from 1966 to 2000

****

	Test Statistic	LL	AIC	SBC	HQC
DF	5.9088	-9.1159	-11.1159	-12.6712	-11.6528
ADF(1)	1.9083	-6.2093	-9.2093	-11.5423	-10.0147
ADF(2)	1.0526	-5.7311	-9.7311	-12.8418	-10.8049
ADF(3)	.41614	-5.2344	-10.2344	-14.1228	-11.5767
ADF(4)	.36480	-5.2344	-11.2344	-15.9005	-12.8451
ADF(5)	.42263	-5.2017	-12.2017	-17.6454	-14.0809

****

95% critical value for the augmented Dickey-Fuller statistic = -2.9472

LL = Maximized log-likelihood   AIC = Akaike Information Criterion

SBC = Schwarz Bayesian Criterion   HQC = Hannan-Quinn Criterion

Unit root tests for variable LRERUSA

The Dickey-Fuller regressions include an intercept and a linear trend

****

35 observations used in the estimation of all ADF regressions.

Sample period from 1966 to 2000

****

	Test Statistic	LL	AIC	SBC	HQC
DF	-1.7373	-2.4986	-5.4986	-7.8316	-6.3039
ADF(1)	-1.7089	-1.6884	-5.6884	-8.7991	-6.7622
ADF(2)	-1.6980	-1.6509	-6.6509	-10.5392	-7.9931
ADF(3)	-1.7199	-1.5434	-7.5434	-12.2094	-9.1541
ADF(4)	-1.5857	-1.4346	-8.4346	-13.8783	-10.3138
ADF(5)	-1.3884	-1.0712	-9.0712	-15.2926	-11.2188

****

95% critical value for the augmented Dickey-Fuller statistic = -3.5426

LL = Maximized log-likelihood   AIC = Akaike Information Criterion

SBC = Schwarz Bayesian Criterion   HQC = Hannan-Quinn Criterion

Unit root tests for variable LREER9

The Dickey-Fuller regressions include an intercept but not a trend

****

35 observations used in the estimation of all ADF regressions.

Sample period from 1966 to 2000

****

	Test Statistic	LL	AIC	SBC	HQC
DF	-.77450	20.2587	18.2587	16.7033	17.7218
ADF(1)	-.72272	20.2598	17.2598	14.9268	16.4545
ADF(2)	-.72270	20.2708	16.2708	13.1601	15.1970
ADF(3)	-.64151	20.2833	15.2833	11.3950	13.9411
ADF(4)	-.42376	20.5318	14.5318	9.8657	12.9210
ADF(5)	-.32000	20.5862	13.5862	8.1425	11.7070

****

95% critical value for the augmented Dickey-Fuller statistic = -2.9472

LL = Maximized log-likelihood AIC = Akaike Information Criterion

SBC = Schwarz Bayesian Criterion HQC = Hannan-Quinn Criterion

Unit root tests for variable LREER9

The Dickey-Fuller regressions include an intercept and a linear trend

****

35 observations used in the estimation of all ADF regressions.

Sample period from 1966 to 2000

****

	Test Statistic	LL	AIC	SBC	HQC
DF	-2.6640	23.6614	20.6614	18.3284	19.8560
ADF(1)	-2.6669	23.8261	19.8261	16.7154	18.7523
ADF(2)	-2.7449	24.1437	19.1437	15.2554	17.8015
ADF(3)	-2.6984	24.2514	18.2514	13.5854	16.6407
ADF(4)	-2.4649	24.2792	17.2792	11.8355	15.4000
ADF(5)	-2.3479	24.2808	16.2808	10.0594	14.1332

****

95% critical value for the augmented Dickey-Fuller statistic = -3.5426

LL = Maximized log-likelihood AIC = Akaike Information Criterion

SBC = Schwarz Bayesian Criterion HQC = Hannan-Quinn Criterion

```
                 Unit root tests for variable DLRERAVUS
     The Dickey-Fuller regressions include an intercept but not a trend
*******************************************************************************
 34 observations used in the estimation of all ADF regressions.
 Sample period from 1967 to 2000
*******************************************************************************
        Test Statistic      LL           AIC           SBC           HQC
 DF         -2.5340       -6.9480       -8.9480      -10.4744       -9.4685
 ADF(1)     -1.9639       -5.8292       -8.8292      -11.1188       -9.6100
 ADF(2)     -1.7714       -5.6324       -9.6324      -12.6851      -10.6734
 ADF(3)     -1.6752       -5.6068      -10.6068      -14.4227      -11.9081
 ADF(4)     -1.5711       -5.5482      -11.5482      -16.1273      -13.1098
 ADF(5)     -1.4168       -5.3111      -12.3111      -17.6534      -14.1330
*******************************************************************************
 95% critical value for the augmented Dickey-Fuller statistic =  -2.9499
 LL  = Maximized log-likelihood      AIC = Akaike Information Criterion
 SBC = Schwarz Bayesian Criterion    HQC = Hannan-Quinn Criterion


                 Unit root tests for variable DLRERAVUS
    The Dickey-Fuller regressions include an intercept and a linear trend
*******************************************************************************
 34 observations used in the estimation of all ADF regressions.
 Sample period from 1967 to 2000
*******************************************************************************
        Test Statistic      LL           AIC           SBC           HQC
 DF         -3.5922       -3.9019       -6.9019       -9.1915       -7.6827
 ADF(1)     -2.6288       -3.9006       -7.9006      -10.9534       -8.9417
 ADF(2)     -2.4050       -3.7681       -8.7681      -12.5840      -10.0695
 ADF(3)     -2.4898       -3.2894       -9.2894      -13.8685      -10.8510
 ADF(4)     -2.6094       -2.6520       -9.6520      -14.9943      -11.4739
 ADF(5)     -2.5627       -2.1927      -10.1927      -16.2982      -12.2749
*******************************************************************************
 95% critical value for the augmented Dickey-Fuller statistic =  -3.5468
 LL  = Maximized log-likelihood      AIC = Akaike Information Criterion
 SBC = Schwarz Bayesian Criterion    HQC = Hannan-Quinn Criterion
```

```
                    Unit root tests for variable DLRERBL
      The Dickey-Fuller regressions include an intercept but not a trend
*******************************************************************************
 34 observations used in the estimation of all ADF regressions.
 Sample period from 1967 to 2000
*******************************************************************************
        Test Statistic      LL           AIC           SBC           HQC
 DF          -2.5782       -8.6039      -10.6039      -12.1302      -11.1244
 ADF(1)      -2.0013       -7.6785      -10.6785      -12.9680      -11.4593
 ADF(2)      -1.7807       -7.4698      -11.4698      -14.5225      -12.5109
 ADF(3)      -1.6618       -7.4277      -12.4277      -16.2436      -13.7290
 ADF(4)      -1.5305       -7.3313      -13.3313      -17.9103      -14.8929
 ADF(5)      -1.3740       -7.0771      -14.0771      -19.4194      -15.8990
*******************************************************************************
 95% critical value for the augmented Dickey-Fuller statistic =  -2.9499
 LL  = Maximized log-likelihood      AIC = Akaike Information Criterion
 SBC = Schwarz Bayesian Criterion    HQC = Hannan-Quinn Criterion


                    Unit root tests for variable DLRERBL
     The Dickey-Fuller regressions include an intercept and a linear trend
*******************************************************************************
 34 observations used in the estimation of all ADF regressions.
 Sample period from 1967 to 2000
*******************************************************************************
        Test Statistic      LL           AIC           SBC           HQC
 DF          -3.7291       -5.3031       -8.3031      -10.5926       -9.0839
 ADF(1)      -2.8720       -5.2847       -9.2847      -12.3374      -10.3257
 ADF(2)      -2.6700       -5.0604      -10.0604      -13.8763      -11.3617
 ADF(3)      -2.7854       -4.4165      -10.4165      -14.9956      -11.9781
 ADF(4)      -2.9403       -3.5621      -10.5621      -15.9043      -12.3839
 ADF(5)      -3.0324       -2.6640      -10.6640      -16.7694      -12.7461
*******************************************************************************
 95% critical value for the augmented Dickey-Fuller statistic =  -3.5468
 LL  = Maximized log-likelihood      AIC = Akaike Information Criterion
 SBC = Schwarz Bayesian Criterion    HQC = Hannan-Quinn Criterion
```

```
                     Unit root tests for variable DLRERENG
      The Dickey-Fuller regressions include an intercept but not a trend
*******************************************************************************
 34 observations used in the estimation of all ADF regressions.
 Sample period from 1967 to 2000
*******************************************************************************
        Test Statistic      LL           AIC          SBC          HQC
 DF          -2.4989      -11.6920      -13.6920     -15.2184     -14.2126
 ADF(1)      -1.9061      -10.8333      -13.8333     -16.1228     -14.6141
 ADF(2)      -1.5940      -10.3553      -14.3553     -17.4080     -15.3963
 ADF(3)      -1.6660      -10.1609      -15.1609     -18.9768     -16.4623
 ADF(4)      -1.3756       -9.7203      -15.7203     -20.2994     -17.2819
 ADF(5)      -1.2361       -9.6185      -16.6185     -21.9607     -18.4403
*******************************************************************************
 95% critical value for the augmented Dickey-Fuller statistic =  -2.9499
 LL  = Maximized log-likelihood      AIC = Akaike Information Criterion
 SBC = Schwarz Bayesian Criterion    HQC = Hannan-Quinn Criterion


                     Unit root tests for variable DLRERENG
     The Dickey-Fuller regressions include an intercept and a linear trend
*******************************************************************************
 34 observations used in the estimation of all ADF regressions.
 Sample period from 1967 to 2000
*******************************************************************************
        Test Statistic      LL           AIC          SBC          HQC
 DF          -3.8647       -7.9203      -10.9203     -13.2098     -11.7011
 ADF(1)      -3.0770       -7.8925      -11.8925     -14.9452     -12.9336
 ADF(2)      -2.6591       -7.8366      -12.8366     -16.6525     -14.1379
 ADF(3)      -3.3643       -5.7491      -11.7491     -16.3282     -13.3107
 ADF(4)      -3.1073       -5.4744      -12.4744     -17.8167     -14.2963
 ADF(5)      -3.2733       -4.5426      -12.5426     -18.6481     -14.6248
*******************************************************************************
 95% critical value for the augmented Dickey-Fuller statistic =  -3.5468
 LL  = Maximized log-likelihood      AIC = Akaike Information Criterion
 SBC = Schwarz Bayesian Criterion    HQC = Hannan-Quinn Criterion
```

Unit root tests for variable DLRERFRA

The Dickey-Fuller regressions include an intercept but not a trend

****

34 observations used in the estimation of all ADF regressions.

Sample period from 1967 to 2000

****

	Test Statistic	LL	AIC	SBC	HQC
DF	-2.5247	-9.3289	-11.3289	-12.8553	-11.8494
ADF(1)	-1.8811	-8.0583	-11.0583	-13.3479	-11.8391
ADF(2)	-1.6581	-7.8245	-11.8245	-14.8773	-12.8656
ADF(3)	-1.5610	-7.8061	-12.8061	-16.6220	-14.1074
ADF(4)	-1.3356	-7.2266	-13.2266	-17.8057	-14.7882
ADF(5)	-1.2779	-7.2218	-14.2218	-19.5640	-16.0436

****

95% critical value for the augmented Dickey-Fuller statistic = -2.9499

LL = Maximized log-likelihood AIC = Akaike Information Criterion

SBC = Schwarz Bayesian Criterion HQC = Hannan-Quinn Criterion

Unit root tests for variable DLRERFRA

The Dickey-Fuller regressions include an intercept and a linear trend

****

34 observations used in the estimation of all ADF regressions.

Sample period from 1967 to 2000

****

	Test Statistic	LL	AIC	SBC	HQC
DF	-3.9454	-5.3376	-8.3376	-10.6271	-9.1184
ADF(1)	-2.9404	-5.3283	-9.3283	-12.3811	-10.3694
ADF(2)	-2.7606	-5.0526	-10.0526	-13.8685	-11.3540
ADF(3)	-3.0154	-4.0941	-10.0941	-14.6732	-11.6557
ADF(4)	-2.7109	-3.8703	-10.8703	-16.2126	-12.6922
ADF(5)	-3.2077	-2.2434	-10.2434	-16.3488	-12.3255

****

95% critical value for the augmented Dickey-Fuller statistic = -3.5468

LL = Maximized log-likelihood AIC = Akaike Information Criterion

SBC = Schwarz Bayesian Criterion HQC = Hannan-Quinn Criterion

```
                    Unit root tests for variable DLRERGER
      The Dickey-Fuller regressions include an intercept but not a trend
*******************************************************************************
 34 observations used in the estimation of all ADF regressions.
 Sample period from 1967 to 2000
*******************************************************************************
        Test Statistic      LL           AIC           SBC           HQC
 DF          -2.6017       -6.7463       -8.7463      -10.2727       -9.2668
 ADF(1)      -2.0075       -5.5672       -8.5672      -10.8567       -9.3480
 ADF(2)      -1.7978       -5.3062       -9.3062      -12.3589      -10.3472
 ADF(3)      -1.7100       -5.2874      -10.2874      -14.1033      -11.5887
 ADF(4)      -1.6252       -5.2646      -11.2646      -15.8437      -12.8262
 ADF(5)      -1.4690       -4.9727      -11.9727      -17.3150      -13.7946
*******************************************************************************
 95% critical value for the augmented Dickey-Fuller statistic =  -2.9499
 LL  = Maximized log-likelihood      AIC = Akaike Information Criterion
 SBC = Schwarz Bayesian Criterion    HQC = Hannan-Quinn Criterion
```

```
                    Unit root tests for variable DLRERGER
     The Dickey-Fuller regressions include an intercept and a linear trend
*******************************************************************************
 34 observations used in the estimation of all ADF regressions.
 Sample period from 1967 to 2000
*******************************************************************************
        Test Statistic      LL           AIC           SBC           HQC
 DF          -3.6598       -3.6455       -6.6455       -8.9350       -7.4263
 ADF(1)      -2.6475       -3.6431       -7.6431      -10.6958       -8.6841
 ADF(2)      -2.3542       -3.5602       -8.5602      -12.3761       -9.8615
 ADF(3)      -2.4507       -3.0769       -9.0769      -13.6560      -10.6385
 ADF(4)      -2.6632       -2.2724       -9.2724      -14.6147      -11.0943
 ADF(5)      -2.5913       -1.7983       -9.7983      -15.9038      -11.8805
*******************************************************************************
 95% critical value for the augmented Dickey-Fuller statistic =  -3.5468
 LL  = Maximized log-likelihood      AIC = Akaike Information Criterion
 SBC = Schwarz Bayesian Criterion    HQC = Hannan-Quinn Criterion
```

```
                   Unit root tests for variable DLRERHOL
      The Dickey-Fuller regressions include an intercept but not a trend
*******************************************************************************
 34 observations used in the estimation of all ADF regressions.
 Sample period from 1967 to 2000
*******************************************************************************
        Test Statistic      LL           AIC          SBC          HQC
 DF         -2.5477       -7.6494       -9.6494     -11.1757     -10.1699
 ADF(1)     -1.9437       -6.3187       -9.3187     -11.6083     -10.0995
 ADF(2)     -1.7644       -6.1443      -10.1443     -13.1970     -11.1854
 ADF(3)     -1.6704       -6.1195      -11.1195     -14.9354     -12.4208
 ADF(4)     -1.5540       -6.0318      -12.0318     -16.6109     -13.5934
 ADF(5)     -1.4134       -5.8219      -12.8219     -18.1641     -14.6437
*******************************************************************************
 95% critical value for the augmented Dickey-Fuller statistic =  -2.9499
 LL  = Maximized log-likelihood      AIC = Akaike Information Criterion
 SBC = Schwarz Bayesian Criterion    HQC = Hannan-Quinn Criterion
```

```
                   Unit root tests for variable DLRERHOL
     The Dickey-Fuller regressions include an intercept and a linear trend
*******************************************************************************
 34 observations used in the estimation of all ADF regressions.
 Sample period from 1967 to 2000
*******************************************************************************
        Test Statistic      LL           AIC          SBC          HQC
 DF         -3.6337       -4.5140       -7.5140      -9.8036      -8.2948
 ADF(1)     -2.5602       -4.4974       -8.4974     -11.5501      -9.5385
 ADF(2)     -2.3578       -4.3574       -9.3574     -13.1733     -10.6587
 ADF(3)     -2.4443       -3.8842       -9.8842     -14.4633     -11.4458
 ADF(4)     -2.4998       -3.3677      -10.3677     -15.7100     -12.1896
 ADF(5)     -2.4694       -2.9173      -10.9173     -17.0227     -12.9994
*******************************************************************************
 95% critical value for the augmented Dickey-Fuller statistic =  -3.5468
 LL  = Maximized log-likelihood      AIC = Akaike Information Criterion
 SBC = Schwarz Bayesian Criterion    HQC = Hannan-Quinn Criterion
```

```
              Unit root tests for variable DLRERITA
     The Dickey-Fuller regressions include an intercept but not a trend
*******************************************************************************
 34 observations used in the estimation of all ADF regressions.
 Sample period from 1967 to 2000
*******************************************************************************
        Test Statistic      LL           AIC           SBC           HQC
 DF          -2.5377       -9.5990      -11.5990      -13.1254      -12.1196
 ADF(1)      -1.8304       -8.0903      -11.0903      -13.3799      -11.8711
 ADF(2)      -1.6459       -7.9826      -11.9826      -15.0353      -13.0237
 ADF(3)      -1.6226       -7.9598      -12.9598      -16.7757      -14.2611
 ADF(4)      -1.3259       -7.3695      -13.3695      -17.9486      -14.9311
 ADF(5)      -1.2094       -7.3037      -14.3037      -19.6459      -16.1255
*******************************************************************************
 95% critical value for the augmented Dickey-Fuller statistic =  -2.9499
 LL  = Maximized log-likelihood      AIC = Akaike Information Criterion
 SBC = Schwarz Bayesian Criterion    HQC = Hannan-Quinn Criterion
```

```
                  Unit root tests for variable DLRERITA
    The Dickey-Fuller regressions include an intercept and a linear trend
*******************************************************************************
 34 observations used in the estimation of all ADF regressions.
 Sample period from 1967 to 2000
*******************************************************************************
        Test Statistic      LL           AIC           SBC           HQC
 DF          -4.0365       -5.4161       -8.4161      -10.7056       -9.1969
 ADF(1)      -2.9105       -5.4120       -9.4120      -12.4647      -10.4531
 ADF(2)      -2.8514       -5.0413      -10.0413      -13.8572      -11.3427
 ADF(3)      -3.3808       -3.4087       -9.4087      -13.9878      -10.9703
 ADF(4)      -3.0493       -3.1961      -10.1961      -15.5384      -12.0180
 ADF(5)      -3.2792       -2.1546      -10.1546      -16.2600      -12.2367
*******************************************************************************
 95% critical value for the augmented Dickey-Fuller statistic =  -3.5468
 LL  = Maximized log-likelihood      AIC = Akaike Information Criterion
 SBC = Schwarz Bayesian Criterion    HQC = Hannan-Quinn Criterion
```

Unit root tests for variable DLRERSWIS

The Dickey-Fuller regressions include an intercept but not a trend

34 observations used in the estimation of all ADF regressions.

Sample period from 1967 to 2000

	Test Statistic	LL	AIC	SBC	HQC
DF	-2.6524	-7.7997	-9.7997	-11.3261	-10.3203
ADF(1)	-2.0055	-6.4073	-9.4073	-11.6968	-10.1881
ADF(2)	-1.7842	-6.0904	-10.0904	-13.1431	-11.1314
ADF(3)	-1.6938	-6.0687	-11.0687	-14.8846	-12.3700
ADF(4)	-1.6604	-6.0615	-12.0615	-16.6406	-13.6231
ADF(5)	-1.4955	-5.7635	-12.7635	-18.1058	-14.5854

95% critical value for the augmented Dickey-Fuller statistic = -2.9499

LL = Maximized log-likelihood AIC = Akaike Information Criterion

SBC = Schwarz Bayesian Criterion HQC = Hannan-Quinn Criterion

Unit root tests for variable DLRERSWIS

The Dickey-Fuller regressions include an intercept and a linear trend

34 observations used in the estimation of all ADF regressions.

Sample period from 1967 to 2000

	Test Statistic	LL	AIC	SBC	HQC
DF	-3.7767	-4.5204	-7.5204	-9.8100	-8.3012
ADF(1)	-2.6553	-4.4966	-8.4966	-11.5493	-9.5376
ADF(2)	-2.3071	-4.4585	-9.4585	-13.2744	-10.7598
ADF(3)	-2.3387	-4.1347	-10.1347	-14.7138	-11.6963
ADF(4)	-2.7229	-3.0211	-10.0211	-15.3634	-11.8430
ADF(5)	-2.5980	-2.6632	-10.6632	-16.7686	-12.7453

95% critical value for the augmented Dickey-Fuller statistic = -3.5468

LL = Maximized log-likelihood AIC = Akaike Information Criterion

SBC = Schwarz Bayesian Criterion HQC = Hannan-Quinn Criterion

Unit root tests for variable DLRERUSA

The Dickey-Fuller regressions include an intercept but not a trend

34 observations used in the estimation of all ADF regressions.

Sample period from 1967 to 2000

	Test Statistic	LL	AIC	SBC	HQC
DF	-2.5008	-8.1186	-10.1186	-11.6450	-10.6392
ADF(1)	-1.8165	-6.4941	-9.4941	-11.7837	-10.2749
ADF(2)	-1.4934	-5.5265	-9.5265	-12.5792	-10.5675
ADF(3)	-1.4112	-5.5072	-10.5072	-14.3231	-11.8085
ADF(4)	-1.3728	-5.5052	-11.5052	-16.0843	-13.0668
ADF(5)	-1.3678	-5.4728	-12.4728	-17.8151	-14.2947

95% critical value for the augmented Dickey-Fuller statistic = -2.9499

LL = Maximized log-likelihood AIC = Akaike Information Criterion

SBC = Schwarz Bayesian Criterion HQC = Hannan-Quinn Criterion

Unit root tests for variable DLRERUSA

The Dickey-Fuller regressions include an intercept and a linear trend

34 observations used in the estimation of all ADF regressions.

Sample period from 1967 to 2000

	Test Statistic	LL	AIC	SBC	HQC
DF	-4.1008	-3.6580	-6.6580	-8.9475	-7.4388
ADF(1)	-2.9631	-3.6503	-7.6503	-10.7030	-8.6914
ADF(2)	-2.2991	-3.6351	-8.6351	-12.4510	-9.9365
ADF(3)	-2.3352	-3.3469	-9.3469	-13.9260	-10.9085
ADF(4)	-2.5422	-2.7039	-9.7039	-15.0462	-11.5258
ADF(5)	-3.0196	-1.2416	-9.2416	-15.3471	-11.3238

95% critical value for the augmented Dickey-Fuller statistic = -3.5468

LL = Maximized log-likelihood AIC = Akaike Information Criterion

SBC = Schwarz Bayesian Criterion HQC = Hannan-Quinn Criterion

```
                    Unit root tests for variable DLREER9
      The Dickey-Fuller regressions include an intercept but not a trend
********************************************************************************
 34 observations used in the estimation of all ADF regressions.
 Sample period from 1967 to 2000
********************************************************************************
        Test Statistic      LL           AIC           SBC           HQC
 DF         -5.9664       19.0863       17.0863       15.5599       16.5658
 ADF(1)     -4.1212       19.0894       16.0894       13.7998       15.3086
 ADF(2)     -3.5039       19.1682       15.1682       12.1155       14.1271
 ADF(3)     -3.4004       19.5710       14.5710       10.7551       13.2696
 ADF(4)     -3.0644       19.6638       13.6638        9.0847       12.1022
 ADF(5)     -2.4534       19.7443       12.7443        7.4020       10.9224
********************************************************************************
 95% critical value for the augmented Dickey-Fuller statistic =  -2.9499
 LL  = Maximized log-likelihood      AIC = Akaike Information Criterion
 SBC = Schwarz Bayesian Criterion    HQC = Hannan-Quinn Criterion
```

```
                    Unit root tests for variable DLREER9
     The Dickey-Fuller regressions include an intercept and a linear trend
********************************************************************************
 34 observations used in the estimation of all ADF regressions.
 Sample period from 1967 to 2000
********************************************************************************
        Test Statistic      LL           AIC           SBC           HQC
 DF         -5.9189       19.2282       16.2282       13.9387       15.4474
 ADF(1)     -4.1031       19.2386       15.2386       12.1858       14.1975
 ADF(2)     -3.5058       19.3491       14.3491       10.5332       13.0477
 ADF(3)     -3.4350       19.8534       13.8534        9.2743       12.2918
 ADF(4)     -3.1287       20.0200       13.0200        7.6778       11.1982
 ADF(5)     -2.5029       20.0386       12.0386        5.9331        9.9564
********************************************************************************
 95% critical value for the augmented Dickey-Fuller statistic =  -3.5468
 LL  = Maximized log-likelihood      AIC = Akaike Information Criterion
 SBC = Schwarz Bayesian Criterion    HQC = Hannan-Quinn Criterion
```

Johansen's maximum likelihood cointegration

Austria

```
     Cointegration with restricted intercepts and no trends in the VAR
   Cointegration LR Test Based on Maximal Eigenvalue of the Stochastic Matrix
*******************************************************************************
 40 observations from 1961 to 2000. Order of VAR = 1.
 List of variables included in the cointegrating vector:
 LTBAVUS         LRYTUR          LRYAVUS         LRERAVUS        Intercept
 List of eigenvalues in descending order:
.94427     .46691     .27320     .11851       0.00
*******************************************************************************
 Null    Alternative    Statistic     95% Critical Value     90% Critical Value
 r = 0      r = 1      115.4860           28.2700               25.8000
 r<= 1      r = 2       25.1626           22.0400               19.8600
 r<= 2      r = 3       12.7641           15.8700               13.8100
 r<= 3      r = 4        5.0455            9.1600                7.5300
*******************************************************************************
 Use the above table to determine r (the number of cointegrating vectors).
```

```
      Cointegration with restricted intercepts and no trends in the VAR
         Cointegration LR Test Based on Trace of the Stochastic Matrix
*******************************************************************************
 40 observations from 1961 to 2000. Order of VAR = 1.
 List of variables included in the cointegrating vector:
 LTBAVUS         LRYTUR          LRYAVUS         LRERAVUS        Intercept
 List of eigenvalues in descending order:
.94427     .46691     .27320     .11851       0.00
*******************************************************************************
 Null    Alternative    Statistic     95% Critical Value     90% Critical Value
 r = 0      r>= 1      158.4581           53.4800               49.9500
 r<= 1      r>= 2       42.9722           34.8700               31.9300
 r<= 2      r>= 3       17.8096           20.1800               17.8800
 r<= 3      r = 4        5.0455            9.1600                7.5300
*******************************************************************************
 Use the above table to determine r (the number of cointegrating vectors).
```

Belgium

```
      Cointegration with restricted intercepts and no trends in the VAR
   Cointegration LR Test Based on Maximal Eigenvalue of the Stochastic Matrix
********************************************************************************
 40 observations from 1961 to 2000. Order of VAR = 1.
 List of variables included in the cointegrating vector:
 LTBL            LRYTUR          LRYBL           LRERBL          Intercept
 List of eigenvalues in descending order:
.93217     .55920     .45960     .24935      .0000
********************************************************************************
 Null    Alternative    Statistic     95% Critical Value     90% Critical Value
 r = 0      r = 1       107.6274           28.2700                25.8000
 r<= 1      r = 2        32.7662           22.0400                19.8600
 r<= 2      r = 3        24.6177           15.8700                13.8100
 r<= 3      r = 4        11.4728            9.1600                 7.5300
********************************************************************************
 Use the above table to determine r (the number of cointegrating vectors).
```

```
      Cointegration with restricted intercepts and no trends in the VAR
         Cointegration LR Test Based on Trace of the Stochastic Matrix
********************************************************************************
 40 observations from 1961 to 2000. Order of VAR = 1.
 List of variables included in the cointegrating vector:
 LTBL            LRYTUR          LRYBL           LRERBL          Intercept
 List of eigenvalues in descending order:
.93217     .55920     .45960     .24935      .0000
********************************************************************************
 Null    Alternative    Statistic     95% Critical Value     90% Critical Value
 r = 0      r>= 1       176.4842           53.4800                49.9500
 r<= 1      r>= 2        68.8568           34.8700                31.9300
 r<= 2      r>= 3        36.0905           20.1800                17.8800
 r<= 3      r = 4        11.4728            9.1600                 7.5300
********************************************************************************
 Use the above table to determine r (the number of cointegrating vectors).
```

England

```
      Cointegration with restricted intercepts and no trends in the VAR
   Cointegration LR Test Based on Maximal Eigenvalue of the Stochastic Matrix
*******************************************************************************
 40 observations from 1961 to 2000. Order of VAR = 1.
 List of variables included in the cointegrating vector:
 LTBENG          LRYTUR          LRYENG          LRERENG         Intercept
 List of eigenvalues in descending order:
.91727     .45113     .27225     .20393      .0000
*******************************************************************************
 Null    Alternative    Statistic     95% Critical Value     90% Critical Value
 r = 0      r = 1        99.6882           28.2700                25.8000
 r<= 1      r = 2        23.9956           22.0400                19.8600
 r<= 2      r = 3        12.7119           15.8700                13.8100
 r<= 3      r = 4         9.1229            9.1600                 7.5300
*******************************************************************************
 Use the above table to determine r (the number of cointegrating vectors).
```

```
      Cointegration with restricted intercepts and no trends in the VAR
         Cointegration LR Test Based on Trace of the Stochastic Matrix
*******************************************************************************
 40 observations from 1961 to 2000. Order of VAR = 1.
 List of variables included in the cointegrating vector:
 LTBENG          LRYTUR          LRYENG          LRERENG         Intercept
 List of eigenvalues in descending order:
.91727     .45113     .27225     .20393      .0000
*******************************************************************************
 Null    Alternative    Statistic     95% Critical Value     90% Critical Value
 r = 0      r>= 1       145.5186           53.4800                49.9500
 r<= 1      r>= 2        45.8304           34.8700                31.9300
 r<= 2      r>= 3        21.8348           20.1800                17.8800
 r<= 3      r = 4         9.1229            9.1600                 7.5300
*******************************************************************************
 Use the above table to determine r (the number of cointegrating vectors).
```

France

Cointegration with restricted intercepts and no trends in the VAR

Cointegration LR Test Based on Maximal Eigenvalue of the Stochastic Matrix

****

40 observations from 1961 to 2000. Order of VAR = 1.

List of variables included in the cointegrating vector:

LTBFRA LRYTUR LRYFRA LRERFRA Intercept

List of eigenvalues in descending order:

.93318 .52805 .31034 .13649 .0000

Null	Alternative	Statistic	95% Critical Value	90% Critical Value
r = 0	r = 1	108.2318	28.2700	25.8000
r<= 1	r = 2	30.0354	22.0400	19.8600
r<= 2	r = 3	14.8622	15.8700	13.8100
r<= 3	r = 4	5.8698	9.1600	7.5300

Use the above table to determine r (the number of cointegrating vectors).

Cointegration with restricted intercepts and no trends in the VAR

Cointegration LR Test Based on Trace of the Stochastic Matrix

40 observations from 1961 to 2000. Order of VAR = 1.

List of variables included in the cointegrating vector:

LTBFRA LRYTUR LRYFRA LRERFRA Intercept

List of eigenvalues in descending order:

.93318 .52805 .31034 .13649 .0000

Null	Alternative	Statistic	95% Critical Value	90% Critical Value
r = 0	r>= 1	158.9991	53.4800	49.9500
r<= 1	r>= 2	50.7673	34.8700	31.9300
r<= 2	r>= 3	20.7319	20.1800	17.8800
r<= 3	r = 4	5.8698	9.1600	7.5300

Use the above table to determine r (the number of cointegrating vectors).

```
      Cointegration with restricted intercepts and no trends in the VAR
   Cointegration LR Test Based on Maximal Eigenvalue of the Stochastic Matrix
*******************************************************************************
 40 observations from 1961 to 2000. Order of VAR = 1.
 List of variables included in the cointegrating vector:
 LTBGER          LRYTUR          LRYGER          LRERGER         Intercept
 List of eigenvalues in descending order:
.94423     .49887     .30796     .10477       0.00
*******************************************************************************
 Null    Alternative    Statistic     95% Critical Value     90% Critical Value
 r = 0      r = 1       115.4632          28.2700               25.8000
 r<= 1      r = 2        27.6358          22.0400               19.8600
 r<= 2      r = 3        14.7246          15.8700               13.8100
 r<= 3      r = 4         4.4270           9.1600                7.5300
*******************************************************************************
 Use the above table to determine r (the number of cointegrating vectors).
```

```
      Cointegration with restricted intercepts and no trends in the VAR
         Cointegration LR Test Based on Trace of the Stochastic Matrix
*******************************************************************************
 40 observations from 1961 to 2000. Order of VAR = 1.
 List of variables included in the cointegrating vector:
 LTBGER          LRYTUR          LRYGER          LRERGER         Intercept
 List of eigenvalues in descending order:
.94423     .49887     .30796     .10477       0.00
*******************************************************************************
 Null    Alternative    Statistic     95% Critical Value     90% Critical Value
 r = 0      r>= 1       162.2507          53.4800               49.9500
 r<= 1      r>= 2        46.7875          34.8700               31.9300
 r<= 2      r>= 3        19.1516          20.1800               17.8800
 r<= 3      r = 4         4.4270           9.1600                7.5300
*******************************************************************************
 Use the above table to determine r (the number of cointegrating vectors).
```

```
      Cointegration with restricted intercepts and no trends in the VAR
   Cointegration LR Test Based on Maximal Eigenvalue of the Stochastic Matrix
*******************************************************************************
 40 observations from 1961 to 2000. Order of VAR = 1.
 List of variables included in the cointegrating vector:
 LTBHOL          LRYTUR          LRYHOL          LRERHOL         Intercept
 List of eigenvalues in descending order:
.93379     .59560     .37946     .23259       0.00
*******************************************************************************
 Null    Alternative    Statistic     95% Critical Value     90% Critical Value
 r = 0      r = 1       108.5980           28.2700                25.8000
 r<= 1      r = 2        36.2140           22.0400                19.8600
 r<= 2      r = 3        19.0868           15.8700                13.8100
 r<= 3      r = 4        10.5895            9.1600                 7.5300
*******************************************************************************
 Use the above table to determine r (the number of cointegrating vectors).
```

```
      Cointegration with restricted intercepts and no trends in the VAR
         Cointegration LR Test Based on Trace of the Stochastic Matrix
*******************************************************************************
 40 observations from 1961 to 2000. Order of VAR = 1.
 List of variables included in the cointegrating vector:
 LTBHOL          LRYTUR          LRYHOL          LRERHOL         Intercept
 List of eigenvalues in descending order:
.93379     .59560     .37946     .23259       0.00
*******************************************************************************
 Null    Alternative    Statistic     95% Critical Value     90% Critical Value
 r = 0      r>= 1       174.4884           53.4800                49.9500
 r<= 1      r>= 2        65.8904           34.8700                31.9300
 r<= 2      r>= 3        29.6764           20.1800                17.8800
 r<= 3      r = 4        10.5895            9.1600                 7.5300
*******************************************************************************
 Use the above table to determine r (the number of cointegrating vectors).
```

Cointegration with restricted intercepts and no trends in the VAR

Cointegration LR Test Based on Maximal Eigenvalue of the Stochastic Matrix

40 observations from 1961 to 2000. Order of VAR = 1.

List of variables included in the cointegrating vector:

LTBITA LRYTUR LRYITA LRERITA Intercept

List of eigenvalues in descending order:

.90558 .60717 .30019 .16767 0.00

Null	Alternative	Statistic	95% Critical Value	90% Critical Value
r = 0	r = 1	94.3997	28.2700	25.8000
r<= 1	r = 2	37.3749	22.0400	19.8600
r<= 2	r = 3	14.2780	15.8700	13.8100
r<= 3	r = 4	7.3413	9.1600	7.5300

Use the above table to determine r (the number of cointegrating vectors).

Cointegration with restricted intercepts and no trends in the VAR

Cointegration LR Test Based on Trace of the Stochastic Matrix

40 observations from 1961 to 2000. Order of VAR = 1.

List of variables included in the cointegrating vector:

LTBITA LRYTUR LRYITA LRERITA Intercept

List of eigenvalues in descending order:

.90558 .60717 .30019 .16767 0.00

Null	Alternative	Statistic	95% Critical Value	90% Critical Value
r = 0	r>= 1	153.3938	53.4800	49.9500
r<= 1	r>= 2	58.9942	34.8700	31.9300
r<= 2	r>= 3	21.6193	20.1800	17.8800
r<= 3	r = 4	7.3413	9.1600	7.5300

Use the above table to determine r (the number of cointegrating vectors).

```
      Cointegration with restricted intercepts and no trends in the VAR
   Cointegration LR Test Based on Maximal Eigenvalue of the Stochastic Matrix
*******************************************************************************
 40 observations from 1961 to 2000. Order of VAR = 1.
 List of variables included in the cointegrating vector:
 LTBSWIS         LRYTUR          LRYSWIS         LRERSWIS        Intercept
 List of eigenvalues in descending order:
.93421     .61067     .28060     .17870       0.00
*******************************************************************************
 Null    Alternative    Statistic     95% Critical Value     90% Critical Value
 r = 0      r = 1       108.8527          28.2700                25.8000
 r<= 1      r = 2        37.7330          22.0400                19.8600
 r<= 2      r = 3        13.1734          15.8700                13.8100
 r<= 3      r = 4         7.8745           9.1600                 7.5300
*******************************************************************************
 Use the above table to determine r (the number of cointegrating vectors).
```

```
      Cointegration with restricted intercepts and no trends in the VAR
         Cointegration LR Test Based on Trace of the Stochastic Matrix
*******************************************************************************
 40 observations from 1961 to 2000. Order of VAR = 1.
 List of variables included in the cointegrating vector:
 LTBSWIS         LRYTUR          LRYSWIS         LRERSWIS        Intercept
 List of eigenvalues in descending order:
.93421     .61067     .28060     .17870       0.00
*******************************************************************************
 Null    Alternative    Statistic     95% Critical Value     90% Critical Value
 r = 0      r>= 1       167.6336          53.4800                49.9500
 r<= 1      r>= 2        58.7809          34.8700                31.9300
 r<= 2      r>= 3        21.0479          20.1800                17.8800
 r<= 3      r = 4         7.8745           9.1600                 7.5300
*******************************************************************************
 Use the above table to determine r (the number of cointegrating vectors).
```

```
      Cointegration with restricted intercepts and no trends in the VAR
   Cointegration LR Test Based on Maximal Eigenvalue of the Stochastic Matrix
*******************************************************************************
 40 observations from 1961 to 2000. Order of VAR = 1.
 List of variables included in the cointegrating vector:
 LTBUSA          LRYTUR          LRYUSA          LRERUSA         Intercept
 List of eigenvalues in descending order:
.95045     .59144     .31377     .12037       0.00
*******************************************************************************
 Null    Alternative    Statistic     95% Critical Value     90% Critical Value
 r = 0      r = 1       120.1885           28.2700                25.8000
 r<= 1      r = 2        35.8049           22.0400                19.8600
 r<= 2      r = 3        15.0619           15.8700                13.8100
 r<= 3      r = 4         5.1303            9.1600                 7.5300
*******************************************************************************
 Use the above table to determine r (the number of cointegrating vectors).
```

```
      Cointegration with restricted intercepts and no trends in the VAR
         Cointegration LR Test Based on Trace of the Stochastic Matrix
*******************************************************************************
 40 observations from 1961 to 2000. Order of VAR = 1.
 List of variables included in the cointegrating vector:
 LTBUSA          LRYTUR          LRYUSA          LRERUSA         Intercept
 List of eigenvalues in descending order:
.95045     .59144     .31377     .12037       0.00
*******************************************************************************
 Null    Alternative    Statistic     95% Critical Value     90% Critical Value
 r = 0      r>= 1       176.1856           53.4800                49.9500
 r<= 1      r>= 2        55.9971           34.8700                31.9300
 r<= 2      r>= 3        20.1921           20.1800                17.8800
 r<= 3      r = 4         5.1303            9.1600                 7.5300
*******************************************************************************
 Use the above table to determine r (the number of cointegrating vectors).
```

```
Estimated Cointegrated Vectors in Johansen Estimation (Normalized in Brackets)
       Cointegration with restricted intercepts and no trends in the VAR
*******************************************************************************
 40 observations from 1961 to 2000. Order of VAR = 1, chosen r =3.
 List of variables included in the cointegrating vector:
 LTBAVUS         LRYTUR          LRYAVUS         LRERAVUS        Intercept
*******************************************************************************
                  Vector  1      Vector  2      Vector  3
 LTBAVUS            -.041424       .0028587        .49179
                  (  -1.0000)    (  -1.0000)    (  -1.0000)

 LRYTUR               .31360       -.49187         .92791
                  (   7.5706)    ( 172.0625)    (  -1.8868)

 LRYAVUS             -.25237       .067478        -.78489
                  (  -6.0923)    ( -23.6044)    (   1.5960)

 LRERAVUS          -.0018174       .012760       -.011435
                  ( -.043873)    (  -4.4635)    (  .023252)

 Intercept           -2.1979        5.1452        -7.0996
                  ( -53.0594)    (  -1799.9)    (  14.4361)

*******************************************************************************
Estimated Cointegrated Vectors in Johansen Estimation (Normalized in Brackets)
       Cointegration with restricted intercepts and no trends in the VAR
*******************************************************************************
 40 observations from 1961 to 2000. Order of VAR = 1, chosen r =4.
 List of variables included in the cointegrating vector:
 LTBL            LRYTUR          LRYBL           LRERBL           Intercept
*******************************************************************************
                  Vector  1      Vector  2      Vector  3      Vector  4
 LTBL               -.026960       -.36342         .22517        -.20693
                  (  -1.0000)    (  -1.0000)    (  -1.0000)    (  -1.0000)

 LRYTUR               .38426       -.48824        -.63220         2.5138
                  (  14.2530)    (  -1.3435)    (   2.8076)    (  12.1482)

 LRYBL               -.37097        1.2291        -.16433        -3.4717
                  ( -13.7601)    (   3.3821)    (   .72980)    ( -16.7776)

 LRERBL            -.0061072      .1579E-3        .026417       -.056167
                  (  -.22653)    ( .4346E-3)    (  -.11732)    (  -.27143)

 Intercept           -2.4348        .11472         7.6499       -12.4364
                  ( -90.3127)    (   .31566)    ( -33.9737)    ( -60.1003)
*******************************************************************************
```

Estimated Cointegrated Vectors in Johansen Estimation (Normalized in Brackets)
Cointegration with restricted intercepts and no trends in the VAR

40 observations from 1961 to 2000. Order of VAR = 1, chosen r =4.
List of variables included in the cointegrating vector:
LTBENG LRYTUR LRYENG LRERENG Intercept

	Vector 1	Vector 2	Vector 3	Vector 4
LTBENG	.085526	.12961	.36807	-.46515
	(-1.0000)	(-1.0000)	(-1.0000)	(-1.0000)
LRYTUR	-.13816	.44721	1.3853	1.2287
	(1.6154)	(-3.4505)	(-3.7635)	(2.6415)
LRYENG	.33635	-1.4515	-1.9614	-4.4503
	(-3.9328)	(11.1989)	(5.3287)	(-9.5674)
LRERENG	-.0030604	-.0034478	-.018922	.0084606
	(.035784)	(.026602)	(.051409)	(.018189)
Intercept	-.22202	1.3279	-7.0249	6.6077
	(2.5960)	(-10.2456)	(19.0856)	(14.2055)

Estimated Cointegrated Vectors in Johansen Estimation (Normalized in Brackets)
Cointegration with restricted intercepts and no trends in the VAR

40 observations from 1961 to 2000. Order of VAR = 1, chosen r =4.
List of variables included in the cointegrating vector:
LTBFRA LRYTUR LRYFRA LRERFRA Intercept

	Vector 1	Vector 2	Vector 3	Vector 4
LTBFRA	-.012581	-.019417	-.37218	.22314
	(-1.0000)	(-1.0000)	(-1.0000)	(-1.0000)
LRYTUR	.45766	.22484	-.85984	-2.1357
	(36.3782)	(11.5793)	(-2.3103)	(9.5709)
LRYFRA	-.45325	.26341	1.4574	2.6116
	(-36.0269)	(13.5656)	(3.9159)	(-11.7039)
LRERFRA	-.0096156	-.0068123	.018695	.060860
	(-.76431)	(-.35084)	(.050231)	(-.27274)
Intercept	-2.8554	-3.6364	3.2343	11.8017
	(-226.9702)	(-187.2787)	(8.6900)	(-52.8887)

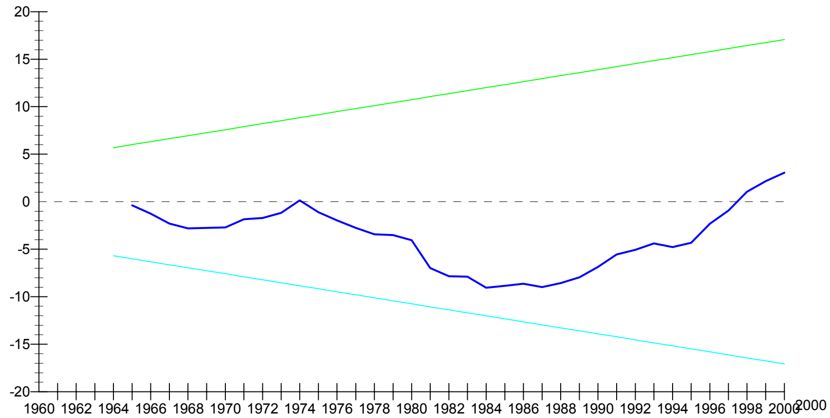
```
Estimated Cointegrated Vectors in Johansen Estimation (Normalized in Brackets)
       Cointegration with restricted intercepts and no trends in the VAR
*******************************************************************************
 40 observations from 1961 to 2000. Order of VAR = 1, chosen r =3.
 List of variables included in the cointegrating vector:
 LTBGER          LRYTUR          LRYGER          LRERGER         Intercept
*******************************************************************************
                  Vector  1      Vector  2      Vector  3
 LTBGER             -.083159         .11028        -.15915
                  (  -1.0000)    (  -1.0000)    (  -1.0000)

 LRYTUR               .32050        -.17936        -2.0445
                  (   3.8541)    (   1.6265)    ( -12.8469)

 LRYGER              -.27558        -.37545         2.8481
                  (  -3.3139)    (   3.4046)    (  17.8961)

 LRERGER           -.0078312       .0091321        .049303
                  ( -.094172)    ( -.082810)    (   .30980)

 Intercept           -2.1090         3.6128         9.8750
                  ( -25.3607)    ( -32.7611)    (  62.0498)

*******************************************************************************
Estimated Cointegrated Vectors in Johansen Estimation (Normalized in Brackets)
       Cointegration with restricted intercepts and no trends in the VAR
*******************************************************************************
 40 observations from 1961 to 2000. Order of VAR = 1, chosen r =4.
 List of variables included in the cointegrating vector:
 LTBHOL          LRYTUR          LRYHOL          LRERHOL         Intercept
*******************************************************************************
                  Vector  1      Vector  2      Vector  3      Vector  4
 LTBHOL            -.0026488         .16718         .40907        -.30363
                  (  -1.0000)    (  -1.0000)    (  -1.0000)    (  -1.0000)

 LRYTUR               .45037         .90562         1.7600         2.4770
                  ( 170.0268)    (  -5.4170)    (  -4.3025)    (   8.1578)

 LRYHOL              -.34707        -.80890        -2.6606        -1.9587
                  (-131.0276)    (   4.8384)    (   6.5041)    (  -6.4508)

 LRERHOL           -.0091810       -.015855       -.025058       -.082935
                  (  -3.4661)    (  .094839)    (  .061256)    (  -.27314)

 Intercept           -3.2789        -6.4192        -7.7218       -18.7605
                  (  -1237.9)    (  38.3964)    (  18.8767)    ( -61.7868)

*******************************************************************************
```

```
Estimated Cointegrated Vectors in Johansen Estimation (Normalized in Brackets)
       Cointegration with restricted intercepts and no trends in the VAR
********************************************************************************
 40 observations from 1961 to 2000. Order of VAR = 1, chosen r =3.
 List of variables included in the cointegrating vector:
 LTBITA          LRYTUR          LRYITA          LRERITA         Intercept
********************************************************************************
                  Vector  1      Vector  2      Vector  3
 LTBITA              .032847        .038514         .22063
                  (  -1.0000)    (  -1.0000)    (  -1.0000)

 LRYTUR              -.26265         .15373         1.8511
                  (   7.9960)    (  -3.9916)    (  -8.3898)

 LRYITA               .16417        -.60786        -2.0788
                  (  -4.9980)    (  15.7831)    (   9.4220)

 LRERITA            .0019955      -.0037302       -.049988
                  ( -.060752)    (  .096855)    (   .22657)

 Intercept            1.9984         .93203       -11.5188
                  ( -60.8387)    ( -24.2000)    (  52.2080)

********************************************************************************
Estimated Cointegrated Vectors in Johansen Estimation (Normalized in Brackets)
       Cointegration with restricted intercepts and no trends in the VAR
********************************************************************************
 40 observations from 1961 to 2000. Order of VAR = 1, chosen r =3.
 List of variables included in the cointegrating vector:
 LTBSWIS         LRYTUR          LRYSWIS         LRERSWIS        Intercept
********************************************************************************
                  Vector  1      Vector  2      Vector  3
 LTBSWIS          -.0029336         .16797         .37488
                  (  -1.0000)    (  -1.0000)    (  -1.0000)

 LRYTUR              -.31612         .59881        -.56162
                  (-107.7590)    (  -3.5649)    (   1.4981)

 LRYSWIS              .27729        -.63952        -.41999
                  (  94.5218)    (   3.8072)    (   1.1203)

 LRERSWIS           .0044511       -.018404        .021326
                  (   1.5173)    (   .10956)    ( -.056889)

 Intercept            2.0958        -3.8738         7.8109
                  ( 714.3980)    (  23.0620)    ( -20.8360)

********************************************************************************
```

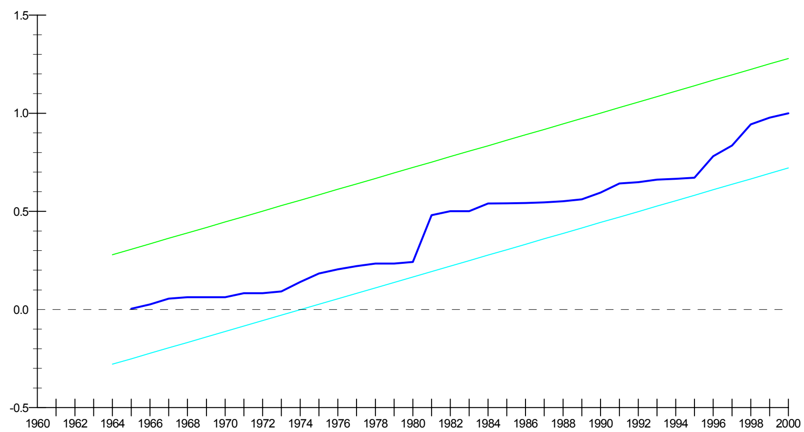
```
Estimated Cointegrated Vectors in Johansen Estimation (Normalized in Brackets)
       Cointegration with restricted intercepts and no trends in the VAR
*******************************************************************************
 40 observations from 1961 to 2000. Order of VAR = 1, chosen r =4.
 List of variables included in the cointegrating vector:
 LTBUSA          LRYTUR          LRYUSA          LRERUSA         Intercept
*******************************************************************************
                  Vector  1      Vector  2      Vector  3      Vector  4
 LTBUSA              -.12398        -.50677        -.37688      -.0097129
                  (  -1.0000)    (  -1.0000)    (  -1.0000)    (  -1.0000)

 LRYTUR             -.099537         .62644         .76447         1.2581
                  (  -.80282)    (   1.2361)    (   2.0284)    ( 129.5302)

 LRYUSA              .044087        -1.0847        -.43784        -2.2684
                  (   .35559)    (  -2.1405)    (  -1.1618)    (-233.5439)

 LRERUSA           -.0051973      -.0078240       -.022980        .019479
                  ( -.041919)    ( -.015439)    ( -.060973)    (   2.0054)

 Intercept            .86267        -1.7428        -6.1618        -4.1386
                  (   6.9579)    (  -3.4391)    ( -16.3496)    (-426.0898)

*******************************************************************************
Estimated Cointegrated Vectors in Johansen Estimation (Normalized in Brackets)
       Cointegration with restricted intercepts and no trends in the VAR
*******************************************************************************
 40 observations from 1961 to 2000. Order of VAR = 1, chosen r =3.
 List of variables included in the cointegrating vector:
 LTBTUR          LRYTUR          LRYWORLD        LREER9          Intercept
*******************************************************************************
                  Vector  1      Vector  2      Vector  3
 LTBTUR              .016680        -.94133        -.10573
                  (  -1.0000)    (  -1.0000)    (  -1.0000)

 LRYTUR             -.070945         1.0953        -1.8632
                  (   4.2532)    (   1.1636)    ( -17.6225)

 LRYWORLD             .28585        -1.2220         3.0845
                  ( -17.1370)    (  -1.2981)    (  29.1739)

 LREER9             -.073405        -.99254         .39786
                  (   4.4007)    (  -1.0544)    (   3.7631)

 Intercept           -.16970       -.089106         4.6240
                  (  10.1736)    ( -.094659)    (  43.7349)

*******************************************************************************
```

Appendix E :CUSUM & CUSUMQ Microfit Results

Figure 11 Austria

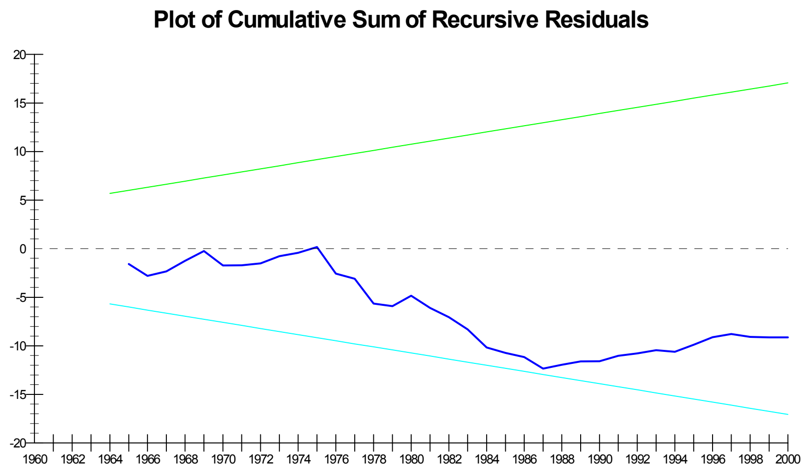


The straight lines represent critical bounds at 5% significance level

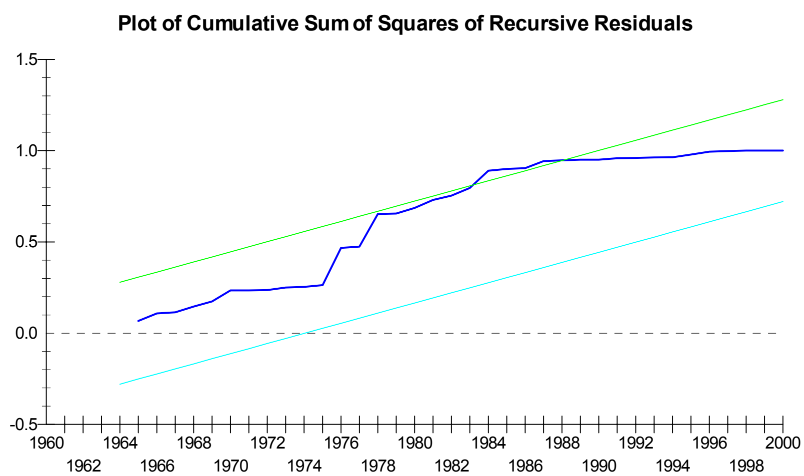


The straight lines represent critical bounds at 5% significance level

Figure 12 Belgium



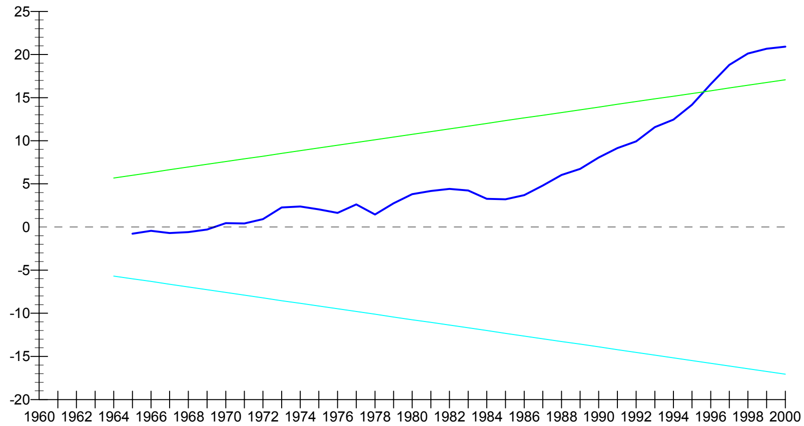
The straight lines represent critical bounds at 5% significance level



The straight lines represent critical bounds at 5% significance level

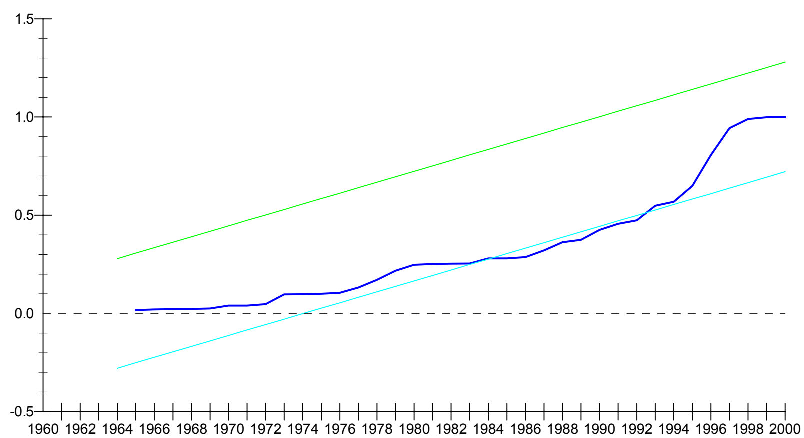
Figure 13 England

Plot of Cumulative Sum of Recursive Residuals



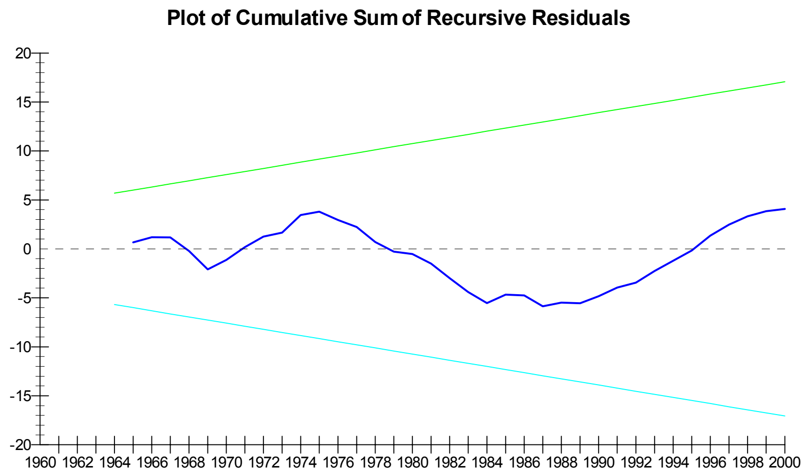
The straight lines represent critical bounds at 5% significance level

Plot of Cumulative Sum of Squares of Recursive Residuals

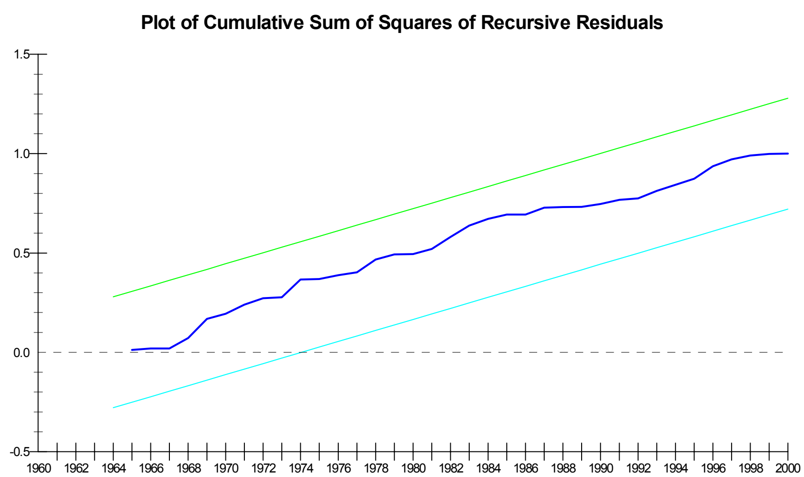


The straight lines represent critical bounds at 5% significance level

Figure 14 France

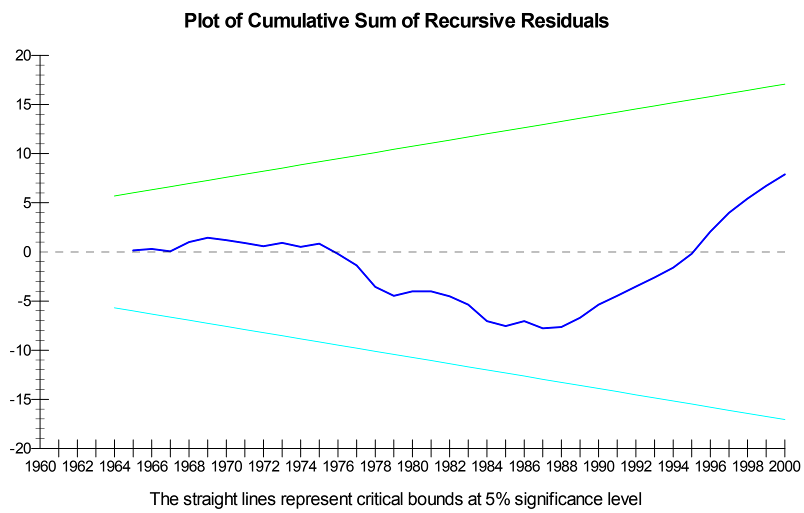


The straight lines represent critical bounds at 5% significance level



The straight lines represent critical bounds at 5% significance level

Figure 15 Germany



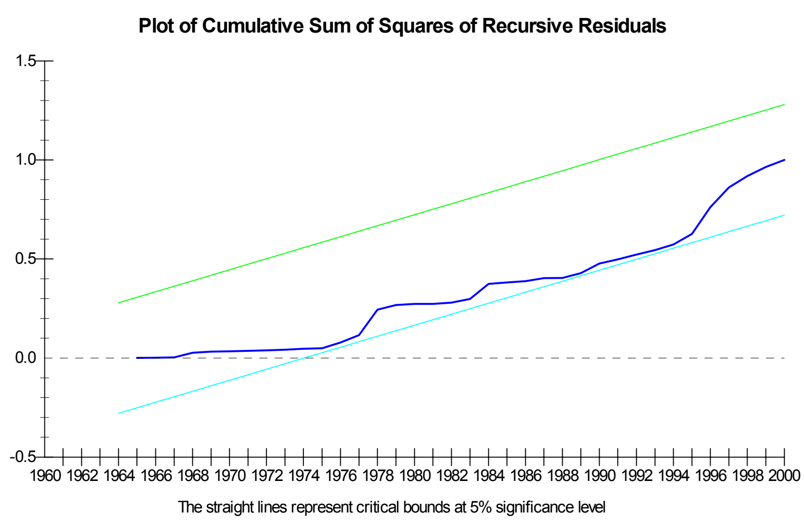
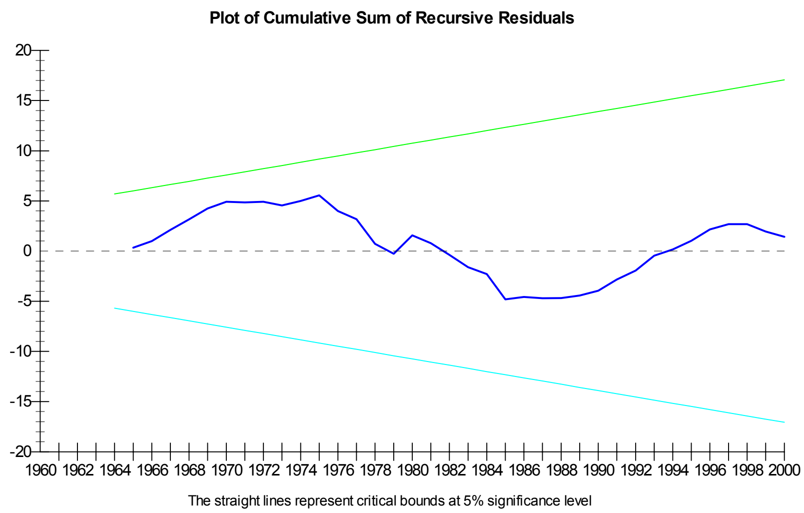


Figure 16 Holland



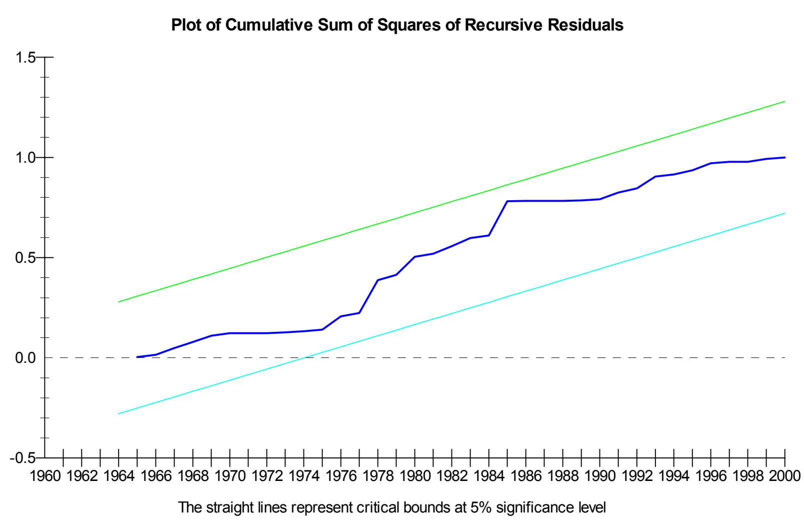
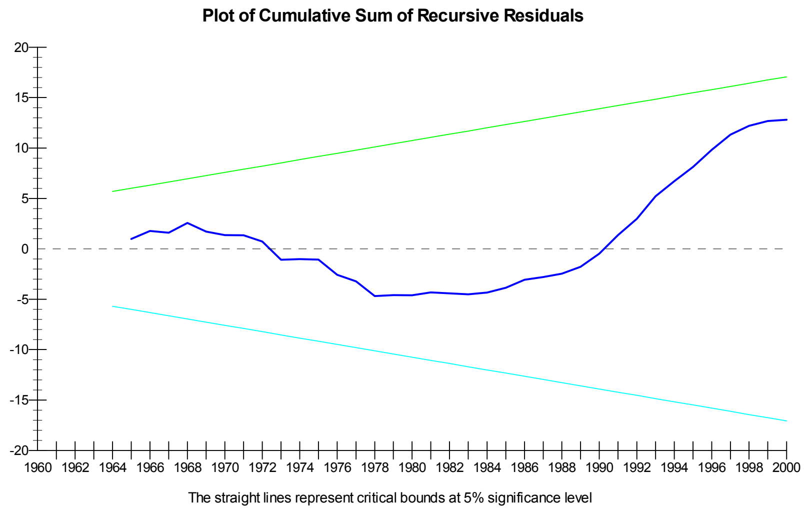


Figure 17 Italy



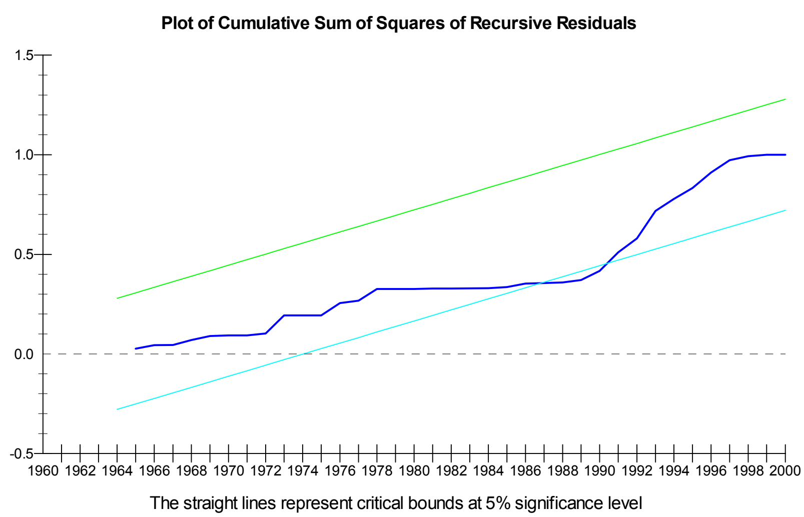
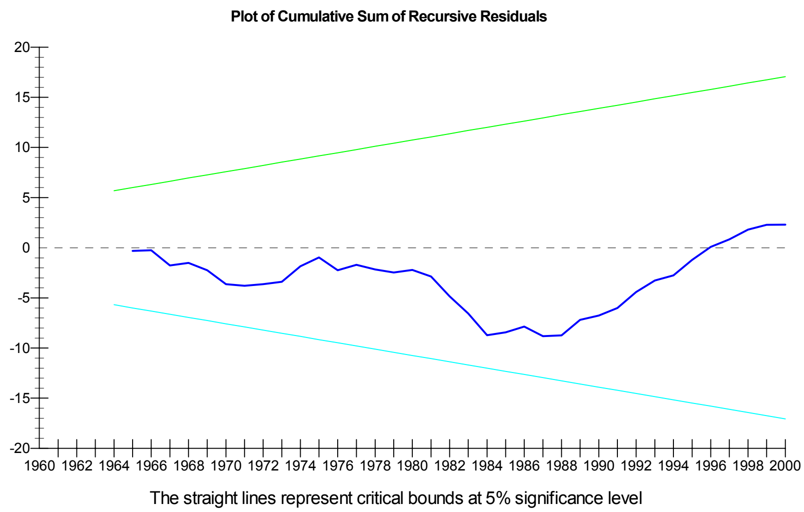


Figure 18 Switzerland



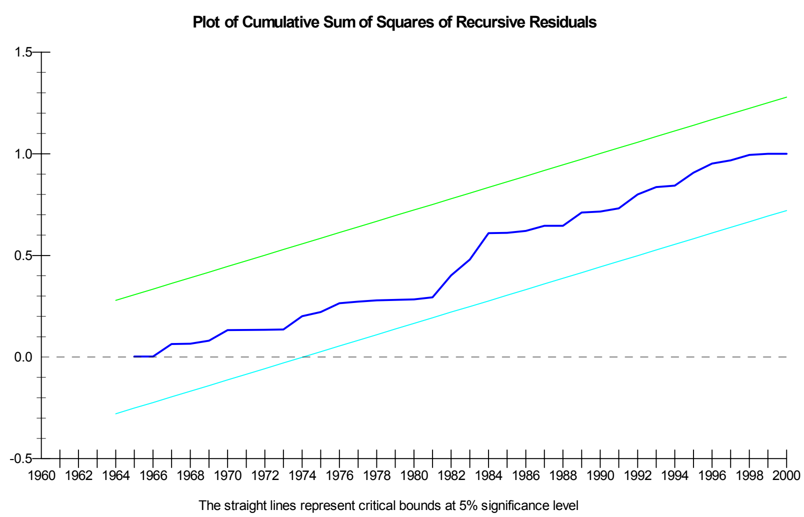
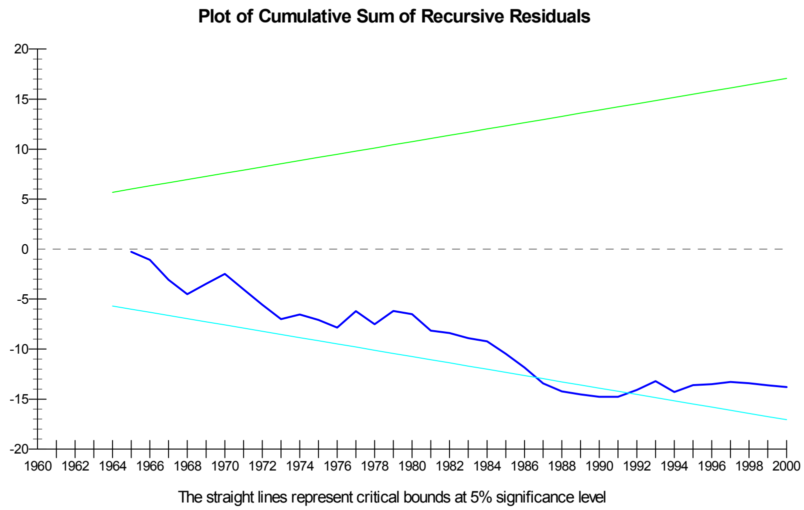


Figure 19 USA



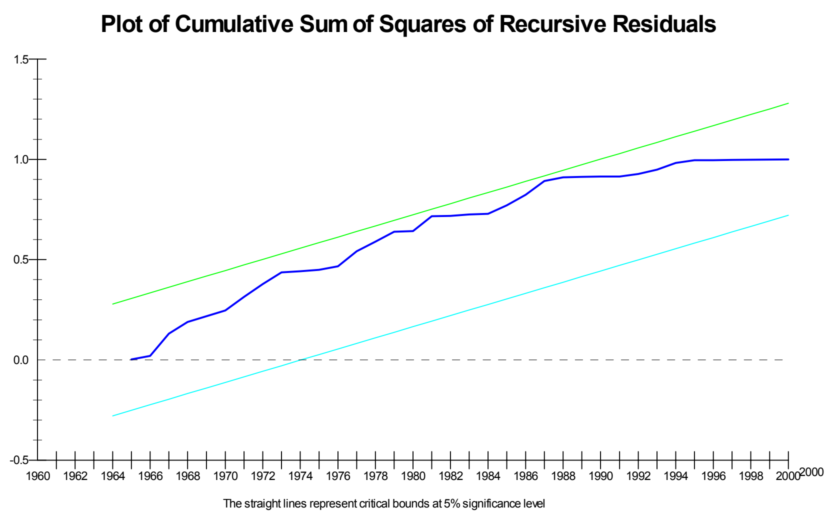


Figure 20 Aggregate