Contents

1. Introduction

In the last two decades the financial systems of industrialized countries have gone through profound changes. Capital markets have considerably developed and many financial innovations have emerged and at the same time we have witnessed a substantial shift toward institutionalized management of savings. National and international boundaries that limited the geographic scope of trade in financial services have been eroded. The activities performed by banks have changed to keep pace with this transformation. The main driving forces behind these developments were the significant demographic changes, the wave of financial liberalisation, the information technology revolution that characterised the past two decades, as well as the launch of the European Economic and Monetary Union (EMU).

Ever since the European Economic Community (EEC) started in 1957, people have suggested more economic cooperation between countries – including a single currency. On January 1, 1999, the exchange rate parities for the countries forming the European Monetary Union (EMU) were irrevocably fixed. That was the start of the final phase of a process initially aimed at introducing a single currency in Europe, but that now has the final goal of creating a United States of Europe.

It is essential to document and monitor this process of the introduction of the Euro, because it has important economic implications. For instance, it is now widely accepted that the size of the financial system is strongly correlated with the level of economic development (King and Levine 1993, Levine, 1997). Different financial system structures have different welfare implications. Bank-based systems provide better inter-temporal and worse cross-sectional risk sharing than market-based systems (Allen and Gale 1995 and 2000). Moreover, increased financial *integration* can reduce the cost of capital and thereby spur economic growth. Two recent reports estimate the effect of substantial further integration in Europe at about 1 percent increase in GDP growth (Giannetti et al. 2002 and London Economics 2002). Similarly, developed and integrated capital markets can improve the welfare of countries joining a monetary union, by achieving better income insurance and consumption smoothing through cross-ownership of productive assets and access to outside credit markets (Sorenson and Yosha 1998, Yosha, Kalemnli-Ozcan and Sorenson 2001). Monitoring and understanding financial system transformation is of major importance for the core functions of central banks as well. Changes in the banking sector and in financial markets may affect the monetary transmission mechanism (see e.g. Ehrmann et al. 2003 and Chatelain et al. 2003). Financial development may change the choice and quality of financial market indicators of underlying economic variables that central banks employ in their conjectural analysis to take monetary policy decisions (Issing 2002). Central banks use modern financial contracts to provide the liquidity the banking system needs to fulfill its function. As the financial system evolves and as this evolution affects the money market, these operational procedures may have to be adjusted as well, including the selection of assets accepted by central banks as collateral against the provision of liquidity. Financial transformation can also have implications for the design, efficiency and safety of large-value payment systems. Although less well known to the general public, this is another major task of central banks. The Eurosystem, for example, is responsible for TARGET, a real-time gross settlement system that allows for intra-day overdrafts against adequate collateral. Again, changes in the relative importance of different assets accompanying the development of the financial system may require, inter alia, adjustment of central banks' collateral policies. Finally, structural change in financial systems can be associated with the emergence of instability. As central banks play an important role in maintaining financial system stability, they need to follow such structural change carefully (Padoa-Schioppa 2003). In the light of these arguments, it should not be surprising that European political and monetary authorities put great emphasis on financial reforms and the integration process in euro area financial markets.

Having in mind the various effects of an Economic Union with a common currency such as the EMU, we examine the existence of Real Interest Rate Parity conditions, as these are defined by the general theory of Purchasing Power Parity theory, among several European Union member states since after the introduction of the Euro an ideal setting has emerged for existence of such a parity (common currency, one central bank that regulates the markets and sets the reference interest rate for the participating members, introduction of common legislative guidelines for tax setting, removal of trade and fund transfer barriers etc..).The study contains three main sections. In the next section, we describe the establishment of the economic and monetary union. Moreover it is examined whether financial structures across European countries have become more similar after the introduction of the single currency. Section 2 assesses the progress toward financial integration in the major euro-area financial segments, namely money markets, bond markets, equity markets and banking. This section also describes some of the most interesting financial developments that occurred alongside with the integration process, partly spurred by the euro. In section 3 we present the general theory of PPP and a literature review of the previous studies in the subject of Real Interest Rate parity. In section 4 we present and our empirical analysis and the results that were derived and we conclude with Section 5.

2. Background on the Economic and Monetary Union

2.1 The establishment of the Economic and Monetary Union

Up to a quarter century before the signing of the Treaty of Maastricht in 1992, Economic and Monetary Union (EMU) has been a recurrent aim of the European Community. When the Community was set up, the international monetary system was that of Bretton Woods, which provided currency stability with the U.S. dollar as the dominant monetary standard. This system began to show signs of weakness in the late 1950s. By 1968-69, revaluation of the Deutschmark and devaluation of the French franc threatened the stability of other European currencies. The Economic and Monetary Union became a goal of the Community at the Hague summit in December 1969. A high level group, chaired by the Luxembourg Prime Minister, Pierre Werner, was asked to report on how EMU could be achieved by 1980.

The Werner report of October 1970 proposed a three-stage process for achieving a complete EMU within a ten-year period. The final objective would be the free movement of capital, the permanent locking of exchange rates or the replacement of the currencies of the six member states by a single currency. In addition, Werner recommended a strengthening of economic policy coordination and the settling of frameworks for national budgetary policies.

In March 1971, the Six agreed in principle on a three-stage approach to EMU, even though they were divided over some of the report's main recommendations. The first stage, narrowing of exchange-rate fluctuations, was to be tried on an experimental basis, without commitment to the other stages.

The break-up of the Bretton Woods system and the floating of the U.S. dollar in August 1971, affected exchange rate stability in Europe. As a response, the Six created the 'snake in the tunnel', a mechanism for managing the fluctuations of European currencies (the snake) inside narrow limits against the dollar (the tunnel). The oil crisis, dollar weakness and policy divergence hampered exchange rate stability and within two years the snake was reduced to the German, Benelux and Danish currencies.

Interest in EMU had not disappeared. EMU was one of the proposals that Leo Tindemans, prime minister of Belgium, made in his 1975 report on European Union, though he acknowledged that it could only be a long run goal. In 1979, the European Monetary System (EMS) was launched, which was built on the concept of stable, but adjustable exchange rates. All the member states' currencies, with the exception of the British pound, joined its Exchange Rate Mechanism (ERM). It provided for a grid of bilateral rates and fluctuations that were not to exceed a margin of 2.25%. The EMS introduced a new currency, the ecu ('European currency unit') as a weighted average of all EMS currencies. The EMS succeeded in reducing exchange rate volatility, which between the years1986-89, was a quarter of what it had been in 1975-79.

The 1985 programme for the completion of the single market aimed at removing all non-tariff barriers to the free movement of goods, persons, services and capital. It became clear, however, that the benefits of the internal market would be difficult to achieve with the uncertainties created by exchange rate fluctuations and the high transaction costs for converting one currency into the other. The single currency was seen as the vital missing piece in the single market project. Moreover, many economists pointed to the so-called impossible triangle: one may not have at the same time free capital movements, stable exchange rates and an independent monetary policy.

The European Council meeting at Hanover in June 1988 established a committee, chaired by the then President of the Commission, Jacques Delors, to study EMU. The Delors Committee included all EC Central Bank Governors and independent experts. Its report, submitted in April 1988, proposed to achieve EMU in three stages. The Madrid European Council of June 1989 decided to proceed to the first stage of EMU, the liberalisation of capital movements, in July 1990. In December 1989, the European Council decided in Strasbourg to convene an Intergovernmental Conference at the end of 1990 in order to negotiate a Treaty on Economic and Monetary Union. This Intergovernmental Conference, held in 1991, resulted in the Treaty on European Union, concluded in Maastricht in December 1991 and signed on February 7, 1992.

2.2 The Maastricht Treaty

The Maastricht Treaty provided for monetary union to be achieved by the end of the last century. A European System of Central Banks (ESCB) was established, which is in charge of conducting a single monetary policy. Its primary objective is to maintain price stability. The ESCB consists of the European Central Bank (ECB) and the national central banks of the member states. They all are independent from Community institutions and the governments of the member states, so as to make sure that no other policy considerations interfere with the price stability objective.

Monetary union was achieved in three stages and economic policies of the member states were regarded as a matter of common concern. They were based on the principle of an open market economy with free competition, favouring an efficient allocation of resources. The Maastricht Treaty introduced an 'excessive deficit procedure' to ensure that member states achieve, and maintain that soundness.

The first stage started in 1990 with the removal of any restriction on capital movement. Stage two began on January 1, 1994: the European Monetary Institute (EMI) was established and governments could no longer have overdraft facilities or any other type of credit facility with the central banks. The third stage of EMU started on January 1, 1999. According to the Treaty, the exchange rates of the participating currencies would be irrevocably fixed, monetary policy would be conducted by the European Central Bank and the Council should take the measures necessary for the rapid introduction of the single currency. The Treaty did not determine how and when the single currency would be introduced. This was decided by the European Council at its meeting in Madrid on December 15 and 16 in 1995. It was at this time that the Madrid Council decided that the name of the single currency would be the Euro.

2.3 The evolution after the Maastricht Treaty

After the signing of the Maastricht Treaty in 1992, it was generally expected that stability in the ERM would continue until monetary union had been achieved. In September 1992, however, speculation triggered by an initial 'no' in the Danish referendum of June on the Treaty and an uncertain outcome of a similar referendum in France, forced the Italian lira and then the British pound out of the ERM. Another currency crisis in July/August 1993 put the French franc under pressure and on August 2, 1993 it was decided to widen the fluctuation bands of the ERM to 15%.

On January 1, 1994, Stage Two of EMU began formally and the European Monetary Institute (EMI) was established, a body charged with strengthening cooperation between the national central banks in preparation for the third stage of EMU. The Commission set up an expert group on the changeover to the single currency in May 1994, with the remit of advising it on the technical preparations for introducing the single currency. This expert group was chaired by Cees Maas, a former chairman of the EU's Monetary Committee. On May 31, 1995, the Commission adopted the 'Green Paper on the practical arrangements for the introduction of the single currency'. This proposed to introduce the single currency in three phases and, together with an EMI report of November 14 on the 'Changeover to the single currency', formed the basis for what was decided at the Madrid meeting of the European Council on December 15 and 16, 1995.

On January 1, 1999 eleven European countries formed an economic and monetary union (EMU) and introduced a single currency - *the Euro*. At that time, the 11 countries of the euro zone were: Austria, Belgium, Finland, France, Germany, Ireland, Italy, Luxembourg, Netherlands, Portugal and Spain, although this number expanded later with Greece joining the EMU in 2002. These countries locked their national currencies together and shared the new currency. They also shared a single interest rate, set by the European Central Bank (ECB), and a single foreign exchange rate policy. However, euro notes and coins were not available until January 1, 2002. Until then the old national currency notes and coins (French francs, Deutschmarks etc) continued to circulate. But in law they were part of the euro.

2.4 Transition to *the EURO*

There was a three-year transition period before euro banknotes and coins were introduced on January 1, 2002. During this period, national currencies continued to exist but as units of the euro. Rates to convert them to the euro were fixed.

Some details about the three phases needed to introduce ***Euro*** are described below:

Phase A

Phase A was to reach consensus on which member states fulfil the necessary conditions to enter monetary union in 1999 as outlined by the Treaty on European Union. These conditions included the independence of each member state's national Central Bank and the achievement of a high degree of sustainable convergence of the economies. For the latter, the Treaty specifies four so-called convergence criteria: price stability, sustainability of public finance, the observation of normal fluctuation margins with the Exchange Rate Mechanism (ERM) and the level of long-term interest rates.

Member states that do not fulfil the necessary conditions for the adoption of a single currency at the beginning of 1998 would join monetary union in a later stage. The Treaty provided that at least every two years, or at the request of a member state concerned, the Council should decide which member states with delayed entrance to monetary union fulfil the necessary conditions to join monetary union.

Phase B

Phase B started on January 1, 1999, as provided in the Treaty and was the beginning of stage three of EMU. It entailed the fixing of the exchange rates of the participating member states and the euro becoming a currency in its own right. The European Central Bank started conducting a single monetary policy and national central banks could no longer conduct their own monetary policy, but began to act as agents for the ECB. In an economic sense, the monetary union started to exist, even without euro notes and coins which began to circulate three years later. Any remaining interest rate differential should be attributed to technical factors, such as market liquidity and differences in credit risk.

In this phase, the euro existed as book money in the bank accounts. Notes and coins were denominated in national currencies. Payments in euros could be made only by bank transfers, cheque, credit card, electronic fund transfers, etc. Any legal obstacle for using the euro was removed on a non-compulsory basis. National notes and coins continued to remain legal tender within the country of issuance until the completion of the changeover process.

To assist exchange rate fixing and monetary union, monetary policy operations between the national central banks and the commercial banks were carried out in euros. A new interbank payment system called the TARGET system was put in place to ensure that payment operations between the European System of Central Banks (ESCB) and the banking system can be processed effectively.

Phase C

Phase C started on January 1, 2002 when euro banknotes and coins began to circulate alongside national notes and coins -- giving both legal status, or accepted as a means of payment. It ended when notes and coins denominated in national currencies cease to be legal tender. At the end of phase C, national notes and coins lost their legal tender status. Member states could decide to shorten the length of Phase C arising from the additional costs of a long dual legal tender situation which would require dual cash handling, dual accounting, dual pricing, etc. Although phase C ushered in a changeover to euro banknotes and coins, it did not imply that national notes and coins have become valueless. They might still be exchanged free of charge at the national central banks for a certain period.

We close this section by stating certain changes for business both within these countries and throughout Europe. It influences the markets in three important ways:

- **Cheaper transaction costs**: The single currency allows countries in the euro zone to trade with each other without changing currencies. This reduces (but not remove) the transaction costs. It costs less for companies to make payments between countries within the euro zone. Firms in the euro zone notice the greatest difference. However, businesses from outside the euro zone, which trade with companies inside it, also notice the effects.

- **Stable exchange rates**: The single currency removes exchange rates between countries in the euro zone. This leads to better decision making for its companies.

- **Transparent price differences**: The single currency makes price differences in different countries in the euro zone more obvious. This affects companies who charge different prices for their products in countries within the euro zone. On the other hand, companies buying from the euro zone are able to compare prices more easily. Either way, this sharpens competition.

3. Interest rates convergence

3.1 PPP theoritical background

PPP is defined as the level of the nominal exchange rate such that the purchasing power of a unit of currency is identical both in the domestic and the foreign economy, as long as that unit of currency is converted into foreign currency. The purchasing power is measured by indices of national prices. Such national price indexes are the consumer price index (CPI) and the wholesale price index (WPI). The formula of the PPP is Pt = Pt*/St, (1) where Pt is the price level of the domestic currency, Pt* is the price level of the foreign currency, and St is the nominal exchange rate. From (1) we have StPt = Pt* (2) and that is the absolute PPP. The relative PPP holds true when changes in PPP are equalized between 2 countries:

$$\frac{\Delta St}{St\text{-}1} + \frac{\Delta Pt}{Pt\text{-}1} = \frac{\Delta Pt^*}{Pt\text{-}1^*} \quad (3)$$

where Δ denotes the first difference operator.

There are two versions of PPP usually mentioned in textbooks. The first one is the absolute PPP, also known as the law of the one price. According to absolute PPP, the value of the real exchange rate is taken to be Q = 1 (or q=0), which implies that prices should literally be equal in different areas when adjusted for exchange rates. The second version is the relative PPP and it simply says that Q is a constant and not necessarily always equal to one. That theory takes into account price differences between countries which occur because of transportation costs, the presence of non-traded goods etc.

In practice however, PPP does not hold continuously. Recent experience with floating exchange rate (especially after 1978) and econometric studies of empirical exchange rate models showed the collapse of the PPP. Overshooting exchange rate models became quite popular in the mid 70's and although such models tend to retain PPP as a long-run equilibrium condition, they allow considerable volatility in the nominal exchange rate, beyond what would be allowed under continuous PPP.

A very interesting derivation from the PPP is the uncovered interest rate differential (UIP). In 1979, Frankel suggested the real interest rate differential model, which explained the link between prices, interest rates and exchange rates. UIP is all about interest rates in 2 countries to expected changes in exchange rates:

$$i1 - i2 = (e12)e - e\,12 \qquad (4)$$

where i1 is the interest rate in the domestic country, i2 is the interest rate in the foreign country, and (e12)e is the expected change in the exchange rate. If the capital markets are efficient, then the expected changes will be increasingly influenced by deviations from the long term PPP and in consequence ee = p1 – p2. That way, and taking under consideration that PPP holds in the long run, we can derive the following formula which links the capital with the goods market : p1 – p2 – e 12 = i1 – i2, with estimated parameter values around +/- 1 for all variables.

The UIP describes a clearing mechanism, but according to empirical data UIP appears more as a long-term relationship. It has been suggested that it is not wise to impose a direct PPP – UIP relationship, but rather a market reaction from deviations from those two elements. The most proper econometric technique to be used is cointegration, with the aim to test if there is a stationary linear reaction among the levels of variables (prices, exchange rates and interest levels), and if that is the case, then to examine the result with the supposed long term relationships. The model which will be used will have two lags will be used to get uncorrelated residuals and the hypothetical parameter restrictions derived from the PPP. The interest differentials will be tested using the multivariate cointegration model developed by Johansen and Juselius (1990) and Johansen (1995). As a first step, the PPP restrictions will be checked in all cointegration vectors, that is, if the cointegration space contains the PPP and UIP restrictions in all cointegrating relations. The second step involves testing whether the PPP and UIP relations are stationary by themselves or alone without mixing other variables in the system. The third step examines the existence of a linear combination of p1, p2 and e12.

Finally we come to the variation of the Fisher equation that is called real interest rate parity (RIP). According to RIP $r_t = r_t^*$ (where $r_t = I_t - \pi_t$ and $r_t^* = I_t^* - \pi_t^*$ and I denotes nominal interest rate, r denotes real interest rate and π_t denotes expected inflation and * denotes foreign). RIP requires that UIP, PPP and the ex ante fisher equation hold for both the domestic and the foreign country (Hallwood and MacDonald 1994, p.45) Alternatively the form can be rewritten by using algebra and the ex post version of the fisher equations of the domestic and foreign countries as follows: r_t-r_t*=(i-i*-Δs)-(p-p*-Δs), where r denotes real interest rate, I denotes nominal interest rate, s denotes exchange rate, p denotes inflation rate and Δs is the difference operator. The first three terms on the right hand side represent deviations from the UIP (country premium) and the last three terms deviations from the PPP (exchange risk premium) (Fountas and WU 1999).

Real interest rate parity (RIP) is an essential assumption in most open-macroeconomic models. This assumption states that rates of interest for similar assets in two different countries must be equal once they have been adjusted by their respective expected inflation rates. The policy implication of this assumption is straightforward. In a context where goods and capitals flow freely and real interest rates are settled in the international markets, individual countries will find their scope for stabilization policies very limited. In other words, the scope of economic policies over real economic variables depends to a great extent on the degree to which international real interest rates can influence domestic monetary policy.

3.2 Literature review

Empirical investigation on real interest rates equalization and convergence does not yield a clear-cut conclusion. Early studies (see e.g. Mishkin 1982, Mark, 1985; Cumby and Mishkin, 1986; Mishkin 1988, Fraser and Taylor, 1990; Dutton, 1993 and Edison and Pauls, 1993) mostly rejected the real interest rate hypothesis using regression analysis. More recent attempts include the application of cointegration techniques although the results are also inconclusive. Some studies find little evidence in favour of parity (see Throop, 1994), while others find positive results for RIP (See Goodwin and Grennes, 1994; Fountas and Wu, 1999). Additional recent research using panel estimations find increasing evidence that the real rate hypothesis could hold for most of western developed countries (see, e.g. Gagnon and Unferth, 1995; Wu and Chen, 2001). In a different approach Evans and Lewis (1995) allow the data to follow a non-linear process and their results are supportive of the parity relationship. In the context of the debate over fiscal policy rules in a monetary union, Haldane and Pradhan (1992), who have tested for ex-ante PPP-CIP and risk-premia effects, suggested that real interest rates are not as yet sufficiently interdependent to support those who have argued that one country's fiscal deficit will necessarily affect fully real interest rates for all other member countries. However, to the extent that a monetary union entails a major regime change, questions of this type are difficult to answer satisfactorily using as benchmark a non-monetary union regime such as the ERM.

Venetis *et al* (2004) found evidence of fractional integration for a number of monthly ex post real interest rate series using the GPH semi parametric estimator on data from fourteen European countries and the US. However, they posed empirical questions on certain time series requirements that emerged from fractional integration and they found that these did not hold pointing to "spurious" long memory and casting doubts with respect to the theoretical origins of long memory in the sample. Common stochastic trends expressed as the sum of stationary past errors did not seem appropriate as an explanation of real interest rate covariation.

According to Goodwin and Grennes (1994), the conventional regression tests of real interest rate equality may be misleading because they neglect to consider transactions costs. A transactions cost band may inhibit the one-to-one correspondence between changes in real rates in alternative countries that is presumed by conventional tests. Alternative tests which overcome these limitations were developed and applied to real interest rates for ten different countries. The alternative tests generate much stronger support for interest parity than is found in the existing literature. Their analysis has argued that the overwhelming lack of support for real interest rate equalization obtained by conventional tests may have resulted from biases raised by ignoring transactions costs. Specifically, non-synchronous variation of individual rates in response to localized financial conditions within the band created by transactions costs may have led to incorrect rejection of interest equalization or interest parity, although the markets in question were fully efficient and integrated. In addition, the presence of unit-roots in the real interest rate series utilized to evaluate interest equalization may have led to incorrect statistical inferences in conventional tests. An alternative empirical consideration of interest parity was undertaken for real rates within the context of cointegration and stationarity tests. This approach allows real interest rates in alternative markets to vary in a non-synchronous manner and evaluates the long-run stability of the parity relationship. Situations under which rates were found to diverge from their long-run equilibrium relationship give evidence of a breakdown in the parity or equality relationship. The alternative tests were applied to real interest rates calculated from Eurocurrency and domestic money market rates for the US and nine other important countries. The empirical results revealed much stronger support for the theoretical parity relationship than is commonly found in the literature. However, this support remained incomplete in that a breakdown in the parity relationship was revealed for a small number of the markets. In all, the results were reasonably consistent with the notion of a long-run equilibrium relationship between real interest rates in the US and rates in the nine other countries. The results thus provided strong evidence in favor of market efficiency and integration among the ten financial markets considered and suggest a much stronger link among the ten financial markets than is implied by the existing empirical literature.

Wu and Chen (2001) found that one stylised fact to emerge from the empirical analysis of interest rates is that the unit-root hypothesis in nominal interest rates cannot be rejected. However, using the panel date unit-root test IM, Pesaran and Shin (1997), Wu and Chen found support for the mean-reverting property of Eurocurrency rates. Thus, neither a vector-error-correction model nor a vector autoregressive model in differences is appropriate for modelling Eurocurrency rates. Instead, conventional modelling strategies with level data are appropriate. Furthermore, the finding of stationary interest rates supports uncovered interest parity, and hence the convergence hypothesis of interest rates. This in turn suggests a limited role for a monetary authority to affect domestic interest rates.

Wu and Fountas (2000) used recently developed cointegration tests that determine endogenously the regime shift to test for bilateral real interest rate convergence (real interest rate parity) in the G7 against the US in the 1974-1995 period. In contrast with previous studies that employed classical regression analysis and standard cointegration tests, their innovative approach provided strong evidence in favour of bilateral real interest rate convergence between the US and several countries in our sample, in particular for short-term interest rates. Furthermore fountas and WU (1999) examined real interest rate convergence in European Countries, by using the Engle and Granger methodology and running tests that allow endogenously determined structural breaks for pairs of countries, and as a result they reported evidence in favour of long term real interest rates convergence.

Siklos and Wohar (1997) studied the relationship between interest rates and inflation rates for 10 countries during the period 1974-95. They found evidence of a unique cointegrating relationship between nominal interest rates of European Monetary System (EMS) countries, the US and Canada, and the US, Germany, and Japan. No similar relationship was obtained between inflation rates with one exception, namely that between the US and Canada. Then they interpret these results as convergence in inflation but not in interest rates. Hence, if interest rates represent an indicator of monetary policy, the countries considered have attempted to implement independent policies but not to an extent which produced divergent trends in inflation.

It is obvious, from the empirical analyses described above, that from the 1980's, empirical evidence is showing a change in trend from less to more supportive tests on RIP. These results may reflect, on the one hand, the evolution over the last twenty five years towards a more integrated international financial market, and, on the other hand, the implementation of new developments in econometrics.

4. Empirical tests and results

4.1 Methodology

In our analysis we will estimate the RIP regression $\mathbf{r_t=a+br_t^*+u_t}$ where r_t and $r_t^*$are the dependant and reference variables, a and b denote the parameters and u_t is the residual or error term. As reference variable (foreign) we will be using the short term and long term real interest rates of Germany, assuming that the German Dominance Hypothesis (GDH) holds. According to the GDH Germany is the dominant country in the ERM and as a consequence Germany determines both nominal interest rates and inflation rates and thus real interest rates in the ERM. This statement implies that other countries borrow Germany's anti-inflation reputation and that German monetary policy retains it's independence or that it has an increased influence in the monetary decision making of the European Central Bank. Several researchers have presented evidence in favor of the GDH such as Karfakis and Moschos (1990) and Thom (1994).

We then define two forms of RIP, following the approach taken by Emerson et al(1992) and Fountas (1999), namely the Strong form and the Weak form. The strong form holds if $\mathbf{u_t}$ is stationary (meaning that the real interest rates of the pair countries that we have run regresions are cointegrated) and a=o, b=1. The weak form holds if $\mathbf{u_t}$ is stationary and $a \neq 0$ and/or $b \neq 1$. The intuition behind the weak form of RIP is that a and b may differ from the values implied by the Strong RIP due to :

- the presence of transaction costs that create a neutral band with no profitable arbitrage opportunities around real interest parity
- Different national tax rates
- The existence of non traded goods whose prices cannot be equalized internationally thus causing price indexes to differ across countries even if fully integrated financial markets exist.
- The existence of a constant foreign exchange risk premium

The following step is to assess the most appropriate technique to test the hypothesis of real interest rate parity (RIP) by examining whether real interest rates are stationary or not. Till now it was widely accepted that classical regression techniques may become invalid if applied to non-stationary variables. More recently, it has become standard practice to pursue different modelling strategies when real interest rates are either stationary or non-stationary. For instance, stationary real interest rates can be best modelled in levels, while first differences are strongly recommended when interest rates are non-stationary. Testing for stationarity of real interest rates is essential to explore the proposition that real rates are equal across countries. The Fisher equation, which postulates a rationale for the long-run relationship between nominal interest rates and expected inflation, is usually the link between this proposition and its empirical application. An essential requirement for this long-run relationship to hold is that ex ante real rate of interest -that is, the difference between the nominal rate and expected inflation- should be mean reverting. Empirical evidence gives ambiguous support to the mean reverting property of real interest rates. In the literature some studies find evidence on existence of unit roots (Rose, 1988). Using cointegration technique, some researchers have pointed out that the nominal rate and realized inflation are non-stationary processes and cointegrated. However, the estimated slope coefficients are considerable different from one, as economic theory would require (Hodrick, 1987; Mishkin, 1992; McCallum, 1994). Having these points in mind we checked for stationarity or not stationarity of the real interest rates time-series by performing unit root tests on the level and on the first difference.

After that we proceeded with cointegration between the pairs of real interest rates, with Germany being the reference country as mentioned earlier, using the Engle-Granger methodology. Engle and Granger (1987) suggested a two step procedure where simple regressions are run for the pairs of real interest rates that are examined and then test tests for the null hypothesis of a unit root are performed, by using the ADF test, in the estimated residuals. This way we can detect if the residuals are stationary and thus ascertain if they contain any deterministic component.

4.2 Data construction

We use both short term and long term interest rates for eleven European countries: Belgium, Denmark, France, Germany, Greece, Ireland, Italy, Netherlands, Spain and the UK. Our measure of short term interest rates is the deposit rate. Our measure of the long term interest rate is the government bond yield. The inflation rates are constructed using the Consumer Price index. The data are quarterly and cover the period from the first quarter of 1980 till the second quarter of 2005 even though, in some cases, data concerning the most recent quarters are not available. The set of the countries includes all ERM member states plus countries that joined the EMS later on. The UK was included since it is a member of the European Union even though the UK does not participate in the EMS.

All data was collected from the IMF International Financial Statistics database. We constructed the ex post real interest rates series by using the Fisher equation as follows:

$$R_{t=} It – (P_{t+4}-P_t)/P_t \ ,$$

where R_t is the real interest rate at time t earned from holding the investment for four quarters, It is the nominal interest rate and P_t is the price index, thus $(P_{t+4}-P_t)/P_t$ is the inflation rate from time t to time t+4. We didn't construct ex ante real interest time series because several studies (e.g. Cumby and Mishkin 1986, Goodwin and Grennes 1994) found similar results using both ex-ante and ex-post real interest rates, thus we deem unnecessary to create such series by using a four period moving average of actual inflation rates.

4.3 Unit root test

Since a necessary condition for performing cointegration tests is that individual time series are non stationary we first performed unit root tests. All short term real interest rates are I(1) except for those of the Netherlands which are I(0) which was excluded from the cointegration tests for short term real interest rates. Respectively all long term real interest rates are I(1) except for those of Greece which was excluded from the cointegration tests for long term real interest rates.

The following tables summarize the findings.

Table 1. Dickey-fuller tests (short term real interest rates) *level data*

COUNTRY	ADF Test Statistic	5% Critical Value
Austria	-2.026891	-2.8986
Belgium	-1.139925	-2.8925
Denmark	-1.424225	-2.8943
France	-1.322317	-2.8912
Germany	-1.654690	-2.8932
Greece	0.245815	-2.8912
Ireland	-1.734280	-2.8912
Italy	-2.588733	-2.8955
Netherlands	**-3.095737**	**-2.8925**
Spain	-0.831173	-2.8967
UK	-1.844724	-2.5876

Table 2. Dickey-fuller tests (short term real interest rates) *1st difference data*

COUNTRY	ADF Test Statistic	5% Critical Value
Austria	-3.673456	-2.8991
Belgium	-4.987127	-2.8928
Denmark	-4.764983	-2.8947
France	-5.063142	-2.8915
Germany	-4.068882	-2.8936
Greece	-3.658136	-2.8915
Ireland	-5.331540	-2.8915
Italy	-3.526060	-2.8959
Netherlands	-4.905930	-2.8928
Spain	-4.461927	-2.8972
UK	-5.194300	-2.9017

Table 3. Dickey-fuller tests (long term real interest rates) *level data*

COUNTRY	ADF Test Statistic	5% Critical Value
Austria	-1.577616	-2.8976
Belgium	-1.171224	-2.8912
Denmark	-1.780006	-2.8925
France	-1.073449	-2.8912
Germany	-1.369096	-2.8912
Greece	0.217943	-2.9472
Ireland	-0.465294	-2.9012
Italy	-1.291254	-2.8912
Netherlands	-1.352087	-2.8912
Spain	-0.930644	-2.8912
UK	-1.384389	-2.8912

Table 4. Dickey-fuller tests (long term real interest rates) *1st difference data*

COUNTRY	ADF Test Statistic	5% Critical Value
Austria	-3.909729	-2.8981
Belgium	-4.400717	-2.8915
Denmark	-4.928504	-2.8932
France	-4.634722	-2.8915
Germany	-4.960749	-2.8915
Greece	-3.534796	-2.9558
Ireland	-4.281086	-2.9017
Italy	-4.582568	-2.8915
Netherlands	-3.877757	-2.8915
Spain	-6.166077	-2.8915
UK	-5.102477	-2.8915

4.4 Engle-Granger Cointegration tests

After establishing the 1st difference stationarity of the time series of the real interest rates we can proceed with by testing for cointegration between pairs of real interest rates with Germany being the reference country, as discussed earlier, using the Engle-Granger methodology. Engle-Granger (1987) suggested a two step procedure where simple regressions are run for the pairs of real interest rates according to the equation $\mathbf{r_t=a+br_t^*+u_t}$,where r_t and br_t*are the dependant and reference variables, a and b denote the parameters and u_t is the residual or error term, and since cointegration is established to test the joint null hypothesis of a=0 and b=1(strong form).

Having run the regressions for short term real interest rates we could not find stationary residuals for any of the pair countries that were examined. The implications of this finding are that we could not establish cointegration of the real interest rates in the short run. This might be explained if we have a closer look at the results. For example when testing for cointegration of short term real interest rates of France and Germany we can see from the residuals plot that structural breaks exist, thus these interest rate gaps are incorporated in the residuals and not the deterministic component of the model. These structural breaks can be attributed to different physical-monetary policies of each country or specific macroeconomic characteristics of each economy (increased dept...).Similar findings of structural breaks are also reported in

Fountas and Wu (1999). In addition when we limited the sample to examine for cointegration from the year 1995 to 2005 we found increased evidence of weak Real Interest Rate Parity since we examined a time period where most of the necessary adjustments needed to achieve economic integration were already performed.

The results, on the other hand, that we obtained from running the regressions for long run real interest rates differ. We found evidence of residual stationarity for the countries of Denmark, Netherlands and the UK, thus the findings can support the weak form of Real Interest Rate Parity for these countries. This finding is very important and can be possibly explained by market anticipation of future enhanced convergence of real interest rates of EMU countries. This can be achieved by pursuing further integration of the financial markets, increased cutting of transaction costs and improved synchronization of physical policies when it is possible.

5. Conclusions

We have tested for the strong and weak forms of the RIP in European countries, according to the German Dominance Hypothesis using data of short term and long term real interest rates for the period of the last 25 years. The results for the short term real interest rates do not favour the Real Interest Rate Parity (RIP) in any country. On the other hand the results obtained for the long term real interest rates of Denmark, the Netherlands and the U.K support the weak version of the RIP. These results contribute to the findings already reported by other empirical researches and the implications of the existence of such a parity has a number of implications concerning the monetary policy of each country. Due to the inability of the utilized method to capture real interest rate parity, in all the short term real interest rates and many long term real interest rates we believe that further research is needed perhaps by using more advanced econometric techniques such as VAR analysis or multifactor analysis models.

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APPENDIX A

STATIONARITY OF REAL INTEREST RATES

1.Stationarity of short term real interest rate series

Austria ADF(2) level

ADF Test Statistic	-2.026891	1% Critical Value*	-3.5153
		5% Critical Value	-2.8986
		10% Critical Value	-2.5863

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(AUSDEP)
Method: Least Squares
Date: 03/09/05 Time: 00:45
Sample(adjusted): 6 83
Included observations: 78 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
AUSDEP(-1)	-0.046020	0.022705	-2.026891	0.0463
D(AUSDEP(-1))	0.209758	0.114259	1.835817	0.0704
D(AUSDEP(-2))	0.164594	0.115239	1.428282	0.1574
C	0.130467	0.075386	1.730664	0.0877

R-squared	0.124213	Mean dependent var	-0.027040
Adjusted R-squared	0.088708	S.D. dependent var	0.202822
S.E. of regression	0.193617	Akaike info criterion	-0.395952
Sum squared resid	2.774070	Schwarz criterion	-0.275095
Log likelihood	19.44214	F-statistic	3.498483
Durbin-Watson stat	1.991895	Prob(F-statistic)	0.019614

Austria ADF(2) 1st difference

ADF Test Statistic	-3.673456	1% Critical Value*	-3.5164
		5% Critical Value	-2.8991
		10% Critical Value	-2.5865

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(AUSDEP,2)
Method: Least Squares
Date: 03/09/05 Time: 00:46
Sample(adjusted): 7 83
Included observations: 77 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(AUSDEP(-1))	-0.625636	0.170313	-3.673456	0.0005
D(AUSDEP(-1),2)	-0.167383	0.154706	-1.081942	0.2828
D(AUSDEP(-2),2)	-0.023529	0.120527	-0.195220	0.8458
C	-0.015005	0.023555	-0.637046	0.5261

R-squared	0.380233	Mean dependent var	0.004680
Adjusted R-squared	0.354763	S.D. dependent var	0.249252
S.E. of regression	0.200216	Akaike info criterion	-0.328288
Sum squared resid	2.926316	Schwarz criterion	-0.206532
Log likelihood	16.63909	F-statistic	14.92871
Durbin-Watson stat	1.962595	Prob(F-statistic)	0.000000

Belgium ADF(2) level

ADF Test Statistic	-1.139925	1% Critical Value*	-3.5015
		5% Critical Value	-2.8925
		10% Critical Value	-2.5831

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(BELDEP)
Method: Least Squares
Date: 03/09/05 Time: 00:46
Sample(adjusted): 4 96
Included observations: 93 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
BELDEP(-1)	-0.025497	0.022367	-1.139925	0.2574
D(BELDEP(-1))	0.122806	0.101868	1.205550	0.2312
D(BELDEP(-2))	0.185478	0.097223	1.907761	0.0596
C	0.080637	0.119958	0.672210	0.5032

R-squared	0.060255	Mean dependent var	-0.065821
Adjusted R-squared	0.028578	S.D. dependent var	0.390167
S.E. of regression	0.384551	Akaike info criterion	0.968577
Sum squared resid	13.16127	Schwarz criterion	1.077506
Log likelihood	-41.03885	F-statistic	1.902187
Durbin-Watson stat	1.990237	Prob(F-statistic)	0.134986

Belgium ADF(2) 1st difference

ADF Test Statistic	-4.987127	1% Critical Value*	-3.5023
		5% Critical Value	-2.8928
		10% Critical Value	-2.5833

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(BELDEP,2)
Method: Least Squares
Date: 03/09/05 Time: 00:46
Sample(adjusted): 5 96
Included observations: 92 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(BELDEP(-1))	-0.780575	0.156518	-4.987127	0.0000
D(BELDEP(-1),2)	-0.107519	0.139801	-0.769084	0.4439
D(BELDEP(-2),2)	0.084751	0.098170	0.863315	0.3903
C	-0.048004	0.041649	-1.152579	0.2522

R-squared	0.465895	Mean dependent var	0.001973
Adjusted R-squared	0.447687	S.D. dependent var	0.520643
S.E. of regression	0.386930	Akaike info criterion	0.981358
Sum squared resid	13.17489	Schwarz criterion	1.091001
Log likelihood	-41.14247	F-statistic	25.58724
Durbin-Watson stat	1.996651	Prob(F-statistic)	0.000000

Denmark ADF(2) level

ADF Test Statistic	-1.424225	1% Critical Value*	-3.5055
		5% Critical Value	-2.8943
		10% Critical Value	-2.5840

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(DENDEP)
Method: Least Squares
Date: 03/09/05 Time: 00:47
Sample(adjusted): 5 92
Included observations: 88 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DENDEP(-1)	-0.020287	0.014244	-1.424225	0.1581
D(DENDEP(-1))	0.339054	0.102013	3.323634	0.0013
D(DENDEP(-2))	-0.025585	0.101618	-0.251781	0.8018
C	0.052771	0.102006	0.517331	0.6063

R-squared	0.153087	Mean dependent var	-0.120377
Adjusted R-squared	0.122840	S.D. dependent var	0.461216
S.E. of regression	0.431960	Akaike info criterion	1.203422
Sum squared resid	15.67352	Schwarz criterion	1.316028
Log likelihood	-48.95058	F-statistic	5.061234
Durbin-Watson stat	1.852881	Prob(F-statistic)	0.002853

Denmark ADF(2) 1st difference

ADF Test Statistic	-4.764983	1% Critical Value*	-3.5064
		5% Critical Value	-2.8947
		10% Critical Value	-2.5842

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(DENDEP,2)
Method: Least Squares
Date: 03/09/05 Time: 00:47
Sample(adjusted): 6 92
Included observations: 87 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(DENDEP(-1))	-0.652550	0.136947	-4.764983	0.0000
D(DENDEP(-1),2)	0.057656	0.121381	0.474997	0.6360
D(DENDEP(-2),2)	0.032794	0.102074	0.321281	0.7488
C	-0.080302	0.050015	-1.605571	0.1122

R-squared	0.305910	Mean dependent var	0.000360
Adjusted R-squared	0.280822	S.D. dependent var	0.511459
S.E. of regression	0.433739	Akaike info criterion	1.212139
Sum squared resid	15.61476	Schwarz criterion	1.325514
Log likelihood	-48.72806	F-statistic	12.19368
Durbin-Watson stat	2.010462	Prob(F-statistic)	0.000001

France ADF(2) level

ADF Test Statistic	-1.322317	1% Critical Value*	-3.4986
		5% Critical Value	-2.8912
		10% Critical Value	-2.5824

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(FRADEP)
Method: Least Squares
Date: 03/09/05 Time: 00:47
Sample(adjusted): 4 100
Included observations: 97 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FRADEP(-1)	-0.019716	0.014910	-1.322317	0.1893
D(FRADEP(-1))	0.218590	0.102432	2.133995	0.0355
D(FRADEP(-2))	-0.057571	0.103772	-0.554784	0.5804
C	0.055805	0.074437	0.749696	0.4553

R-squared	0.065405	Mean dependent var	-0.042407
Adjusted R-squared	0.035257	S.D. dependent var	0.257317
S.E. of regression	0.252740	Akaike info criterion	0.127454
Sum squared resid	5.940623	Schwarz criterion	0.233628
Log likelihood	-2.181531	F-statistic	2.169457
Durbin-Watson stat	1.972875	Prob(F-statistic)	0.096859

France ADF(2) 1st difference

ADF Test Statistic	-5.063142	1% Critical Value*	-3.4993
		5% Critical Value	-2.8915
		10% Critical Value	-2.5826

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(FRADEP,2)
Method: Least Squares
Date: 03/09/05 Time: 00:48
Sample(adjusted): 5 100
Included observations: 96 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(FRADEP(-1))	-0.818635	0.161685	-5.063142	0.0000
D(FRADEP(-1),2)	0.049442	0.138315	0.357457	0.7216
D(FRADEP(-2),2)	-0.068644	0.104551	-0.656558	0.5131
C	-0.036268	0.027160	-1.335357	0.1851

R-squared	0.405118	Mean dependent var	5.13E-05
Adjusted R-squared	0.385720	S.D. dependent var	0.326085
S.E. of regression	0.255573	Akaike info criterion	0.150153
Sum squared resid	6.009193	Schwarz criterion	0.257000
Log likelihood	-3.207326	F-statistic	20.88420
Durbin-Watson stat	1.992784	Prob(F-statistic)	0.000000

Germany ADF(2) level

ADF Test Statistic	-1.654690	1% Critical Value*	-3.5031
		5% Critical Value	-2.8932
		10% Critical Value	-2.5834

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(GERDEP)
Method: Least Squares
Date: 03/09/05 Time: 00:48
Sample(adjusted): 4 94
Included observations: 91 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GERDEP(-1)	-0.029511	0.017835	-1.654690	0.1016
D(GERDEP(-1))	0.700358	0.100038	7.000932	0.0000
D(GERDEP(-2))	-0.116939	0.100725	-1.160968	0.2488
C	0.116972	0.093387	1.252552	0.2137

R-squared	0.423722	Mean dependent var	-0.064918
Adjusted R-squared	0.403851	S.D. dependent var	0.448963
S.E. of regression	0.346647	Akaike info criterion	0.761942
Sum squared resid	10.45429	Schwarz criterion	0.872310
Log likelihood	-30.66838	F-statistic	21.32295
Durbin-Watson stat	1.809398	Prob(F-statistic)	0.000000

Germany ADF(2) 1st difference

ADF Test Statistic	-4.068882	1% Critical Value*	-3.5039
		5% Critical Value	-2.8936
		10% Critical Value	-2.5836

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(GERDEP,2)
Method: Least Squares
Date: 03/09/05 Time: 00:48
Sample(adjusted): 5 94
Included observations: 90 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(GERDEP(-1))	-0.412484	0.101375	-4.068882	0.0001
D(GERDEP(-1),2)	0.195025	0.107499	1.814192	0.0731
D(GERDEP(-2),2)	-0.076771	0.099260	-0.773442	0.4414
C	-0.031009	0.036924	-0.839811	0.4033

R-squared	0.228282	Mean dependent var	-0.004045
Adjusted R-squared	0.201361	S.D. dependent var	0.386678
S.E. of regression	0.345561	Akaike info criterion	0.756130
Sum squared resid	10.26946	Schwarz criterion	0.867233
Log likelihood	-30.02586	F-statistic	8.479868
Durbin-Watson stat	2.063469	Prob(F-statistic)	0.000054

Greece ADF(2) level

ADF Test Statistic	0.245815	1% Critical Value*	-3.4986
		5% Critical Value	-2.8912
		10% Critical Value	-2.5824

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(GREDEP)
Method: Least Squares
Date: 03/09/05 Time: 00:49
Sample(adjusted): 4 100
Included observations: 97 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GREDEP(-1)	0.002397	0.009751	0.245815	0.8064
D(GREDEP(-1))	0.498790	0.104044	4.794041	0.0000
D(GREDEP(-2))	-0.089872	0.109227	-0.822806	0.4127
C	-0.098879	0.142328	-0.694728	0.4890

R-squared	0.219588	Mean dependent var	-0.112590
Adjusted R-squared	0.194413	S.D. dependent var	0.569934
S.E. of regression	0.511541	Akaike info criterion	1.537586
Sum squared resid	24.33573	Schwarz criterion	1.643760
Log likelihood	-70.57292	F-statistic	8.722600
Durbin-Watson stat	1.952269	Prob(F-statistic)	0.000037

Greece ADF(2) 1st difference

ADF Test Statistic	-3.658136	1% Critical Value*	-3.4993
		5% Critical Value	-2.8915
		10% Critical Value	-2.5826

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(GREDEP,2)
Method: Least Squares
Date: 03/09/05 Time: 00:50
Sample(adjusted): 5 100
Included observations: 96 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(GREDEP(-1))	-0.444364	0.121473	-3.658136	0.0004
D(GREDEP(-1),2)	-0.033732	0.115483	-0.292092	0.7709
D(GREDEP(-2),2)	-0.243268	0.104612	-2.325438	0.0222
C	-0.050104	0.053102	-0.943547	0.3479

R-squared	0.314027	Mean dependent var	0.000138
Adjusted R-squared	0.291658	S.D. dependent var	0.594015
S.E. of regression	0.499941	Akaike info criterion	1.492122
Sum squared resid	22.99461	Schwarz criterion	1.598970
Log likelihood	-67.62186	F-statistic	14.03867
Durbin-Watson stat	1.943768	Prob(F-statistic)	0.000000

Ireland ADF(2) level

ADF Test Statistic	-1.734280	1% Critical Value*	-3.4986
		5% Critical Value	-2.8912
		10% Critical Value	-2.5824

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(IREDEP)
Method: Least Squares
Date: 03/09/05 Time: 00:50
Sample(adjusted): 4 100
Included observations: 97 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
IREDEP(-1)	-0.034693	0.020004	-1.734280	0.0862
D(IREDEP(-1))	0.285880	0.094500	3.025177	0.0032
D(IREDEP(-2))	-0.314733	0.093943	-3.350242	0.0012
C	0.020637	0.113872	0.181229	0.8566

R-squared	0.186715	Mean dependent var	-0.113817
Adjusted R-squared	0.160480	S.D. dependent var	0.862542
S.E. of regression	0.790307	Akaike info criterion	2.407572
Sum squared resid	58.08643	Schwarz criterion	2.513746
Log likelihood	-112.7673	F-statistic	7.117003
Durbin-Watson stat	1.894724	Prob(F-statistic)	0.000235

Ireland ADF(2) 1st difference

ADF Test Statistic	-5.331540	1% Critical Value*	-3.4993
		5% Critical Value	-2.8915
		10% Critical Value	-2.5826

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(IREDEP,2)
Method: Least Squares
Date: 03/09/05 Time: 00:50
Sample(adjusted): 5 100
Included observations: 96 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(IREDEP(-1))	-0.848490	0.159145	-5.331540	0.0000
D(IREDEP(-1),2)	0.175151	0.119342	1.467637	0.1456
D(IREDEP(-2),2)	-0.172971	0.098951	-1.748047	0.0838
C	-0.083376	0.082617	-1.009182	0.3155

R-squared	0.486422	Mean dependent var	0.021177
Adjusted R-squared	0.469675	S.D. dependent var	1.079996
S.E. of regression	0.786490	Akaike info criterion	2.398301
Sum squared resid	56.90816	Schwarz criterion	2.505149
Log likelihood	-111.1184	F-statistic	29.04513
Durbin-Watson stat	1.931976	Prob(F-statistic)	0.000000

Italy ADF(2) level

ADF Test Statistic	-2.588733	1% Critical Value*	-3.5082
		5% Critical Value	-2.8955
		10% Critical Value	-2.5846

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(ITADEP)
Method: Least Squares
Date: 03/09/05 Time: 00:51
Sample(adjusted): 12 96
Included observations: 85 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ITADEP(-1)	-0.028314	0.010937	-2.588733	0.0114
D(ITADEP(-1))	0.264333	0.104497	2.529579	0.0134
D(ITADEP(-2))	0.109229	0.103869	1.051598	0.2961
C	0.068006	0.079909	0.851035	0.3973

R-squared	0.194755	Mean dependent var	-0.174412
Adjusted R-squared	0.164931	S.D. dependent var	0.387378
S.E. of regression	0.353994	Akaike info criterion	0.806844
Sum squared resid	10.15028	Schwarz criterion	0.921793
Log likelihood	-30.29088	F-statistic	6.530182
Durbin-Watson stat	1.906673	Prob(F-statistic)	0.000519

Italy ADF(2) 1st difference

ADF Test Statistic	-3.526060	1% Critical Value*	-3.5092
		5% Critical Value	-2.8959
		10% Critical Value	-2.5849

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(ITADEP,2)
Method: Least Squares
Date: 03/09/05 Time: 00:51
Sample(adjusted): 13 96
Included observations: 84 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(ITADEP(-1))	-0.478214	0.135623	-3.526060	0.0007
D(ITADEP(-1),2)	-0.193591	0.127719	-1.515760	0.1335
D(ITADEP(-2),2)	-0.117114	0.105229	-1.112945	0.2691
C	-0.077654	0.045197	-1.718103	0.0896

R-squared	0.335007	Mean dependent var	0.008720
Adjusted R-squared	0.310070	S.D. dependent var	0.428842
S.E. of regression	0.356205	Akaike info criterion	0.819828
Sum squared resid	10.15057	Schwarz criterion	0.935581
Log likelihood	-30.43277	F-statistic	13.43402
Durbin-Watson stat	2.016714	Prob(F-statistic)	0.000000

Netherlands ADF(2) level

ADF Test Statistic	-3.095737	1% Critical Value*	-3.5015
		5% Critical Value	-2.8925
		10% Critical Value	-2.5831

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(NETDEP)
Method: Least Squares
Date: 03/09/05 Time: 00:51
Sample(adjusted): 8 100
Included observations: 93 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
NETDEP(-1)	-0.107282	0.034655	-3.095737	0.0026
D(NETDEP(-1))	0.114938	0.100708	1.141304	0.2568
D(NETDEP(-2))	0.060897	0.108008	0.563818	0.5743
C	0.358830	0.127543	2.813403	0.0060

R-squared	0.107155	Mean dependent var	-0.028817
Adjusted R-squared	0.077059	S.D. dependent var	0.295443
S.E. of regression	0.283831	Akaike info criterion	0.361185
Sum squared resid	7.169859	Schwarz criterion	0.470114
Log likelihood	-12.79510	F-statistic	3.560437
Durbin-Watson stat	2.023252	Prob(F-statistic)	0.017387

Netherlands ADF(2) 1st difference

ADF Test Statistic	-4.905930	1% Critical Value*	-3.5023
		5% Critical Value	-2.8928
		10% Critical Value	-2.5833

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(NETDEP,2)
Method: Least Squares
Date: 03/09/05 Time: 00:52
Sample(adjusted): 9 100
Included observations: 92 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(NETDEP(-1))	-0.874098	0.178172	-4.905930	0.0000
D(NETDEP(-1),2)	-0.029498	0.152835	-0.193004	0.8474
D(NETDEP(-2),2)	-0.006890	0.113313	-0.060802	0.9517
C	-0.027350	0.031891	-0.857600	0.3934

R-squared	0.452480	Mean dependent var	-0.001783
Adjusted R-squared	0.433815	S.D. dependent var	0.398020
S.E. of regression	0.299491	Akaike info criterion	0.469043
Sum squared resid	7.893169	Schwarz criterion	0.578686
Log likelihood	-17.57596	F-statistic	24.24159
Durbin-Watson stat	2.000055	Prob(F-statistic)	0.000000

Spain ADF(2) level

ADF Test Statistic	-0.831173	1% Critical Value*	-3.5111
		5% Critical Value	-2.8967
		10% Critical Value	-2.5853

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(SPADEP)
Method: Least Squares
Date: 03/09/05 Time: 00:52
Sample(adjusted): 12 93
Included observations: 82 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
SPADEP(-1)	-0.008815	0.010606	-0.831173	0.4084
D(SPADEP(-1))	0.605365	0.112921	5.360978	0.0000
D(SPADEP(-2))	0.002542	0.113843	0.022331	0.9822
C	0.014652	0.090711	0.161522	0.8721

R-squared	0.365366	Mean dependent var	-0.124078
Adjusted R-squared	0.340957	S.D. dependent var	0.401492
S.E. of regression	0.325937	Akaike info criterion	0.643325
Sum squared resid	8.286326	Schwarz criterion	0.760726
Log likelihood	-22.37634	F-statistic	14.96849
Durbin-Watson stat	1.986476	Prob(F-statistic)	0.000000

Spain ADF(2) 1st difference

ADF Test Statistic	-4.461927	1% Critical Value*	-3.5121
		5% Critical Value	-2.8972
		10% Critical Value	-2.5855

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(SPADEP,2)
Method: Least Squares
Date: 03/09/05 Time: 00:52
Sample(adjusted): 13 93
Included observations: 81 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(SPADEP(-1))	-0.486854	0.109113	-4.461927	0.0000
D(SPADEP(-1),2)	0.086082	0.119214	0.722078	0.4724
D(SPADEP(-2),2)	0.179047	0.111153	1.610813	0.1113
C	-0.066988	0.037933	-1.765943	0.0814

R-squared	0.234481	Mean dependent var	-0.009231
Adjusted R-squared	0.204656	S.D. dependent var	0.360489
S.E. of regression	0.321491	Akaike info criterion	0.616430
Sum squared resid	7.958466	Schwarz criterion	0.734674
Log likelihood	-20.96540	F-statistic	7.861799
Durbin-Watson stat	1.978881	Prob(F-statistic)	0.000121

UK ADF(2) level

ADF Test Statistic	-1.844724	1% Critical Value*	-3.5213
		5% Critical Value	-2.9012
		10% Critical Value	-2.5876

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(UKDEP)
Method: Least Squares
Date: 03/09/05 Time: 00:53
Sample(adjusted): 4 76
Included observations: 73 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
UKDEP(-1)	-0.077877	0.042216	-1.844724	0.0694
D(UKDEP(-1))	0.182481	0.117002	1.559641	0.1234
D(UKDEP(-2))	-0.077910	0.118160	-0.659364	0.5119
C	0.523618	0.379790	1.378705	0.1724

R-squared	0.079162	Mean dependent var	-0.129481
Adjusted R-squared	0.039126	S.D. dependent var	1.253088
S.E. of regression	1.228329	Akaike info criterion	3.302423
Sum squared resid	104.1067	Schwarz criterion	3.427928
Log likelihood	-116.5384	F-statistic	1.977254
Durbin-Watson stat	2.000602	Prob(F-statistic)	0.125444

UK ADF(2)1st difference

ADF Test Statistic	-5.194300	1% Critical Value*	-3.5226
		5% Critical Value	-2.9017
		10% Critical Value	-2.5879

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(UKDEP,2)
Method: Least Squares
Date: 03/09/05 Time: 00:53
Sample(adjusted): 5 76
Included observations: 72 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(UKDEP(-1))	-1.007083	0.193882	-5.194300	0.0000
D(UKDEP(-1),2)	0.151204	0.156161	0.968255	0.3363
D(UKDEP(-2),2)	0.045741	0.119918	0.381435	0.7041
C	-0.113729	0.150615	-0.755099	0.4528

R-squared	0.446148	Mean dependent var	0.018661
Adjusted R-squared	0.421713	S.D. dependent var	1.653268
S.E. of regression	1.257230	Akaike info criterion	3.349652
Sum squared resid	107.4827	Schwarz criterion	3.476133
Log likelihood	-116.5875	F-statistic	18.25881
Durbin-Watson stat	2.040126	Prob(F-statistic)	0.000000

2. Stationarity of long term real interest rate series

Austria ADF(2) level

ADF Test Statistic	-1.577616	1% Critical Value*	-3.5132
		5% Critical Value	-2.8976
		10% Critical Value	-2.5858

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(AUSBOND)
Method: Least Squares
Date: 03/09/05 Time: 00:36
Sample(adjusted): 4 83
Included observations: 80 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
AUSBOND(-1)	-0.033266	0.021086	-1.577616	0.1188
D(AUSBOND(-1))	0.476520	0.112623	4.231114	0.0001
D(AUSBOND(-2))	-0.019194	0.112089	-0.171236	0.8645
C	0.212728	0.156298	1.361042	0.1775

R-squared	0.231251	Mean dependent var	-0.048126
Adjusted R-squared	0.200906	S.D. dependent var	0.360982
S.E. of regression	0.322690	Akaike info criterion	0.624456
Sum squared resid	7.913778	Schwarz criterion	0.743557
Log likelihood	-20.97823	F-statistic	7.620643
Durbin-Watson stat	1.951803	Prob(F-statistic)	0.000161

Austria ADF(2) 1st difference

ADF Test Statistic	-3.909729	1% Critical Value*	-3.5142
		5% Critical Value	-2.8981
		10% Critical Value	-2.5860

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(AUSBOND,2)
Method: Least Squares
Date: 03/09/05 Time: 00:37
Sample(adjusted): 5 83
Included observations: 79 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(AUSBOND(-1))	-0.528728	0.135234	-3.909729	0.0002
D(AUSBOND(-1),2)	0.022760	0.127002	0.179208	0.8583
D(AUSBOND(-2),2)	-0.126836	0.111089	-1.141757	0.2572
C	-0.030202	0.037033	-0.815527	0.4174

R-squared	0.298306	Mean dependent var	-0.002734
Adjusted R-squared	0.270239	S.D. dependent var	0.378987
S.E. of regression	0.323754	Akaike info criterion	0.631640
Sum squared resid	7.861242	Schwarz criterion	0.751612
Log likelihood	-20.94976	F-statistic	10.62809
Durbin-Watson stat	1.958815	Prob(F-statistic)	0.000007

Belgium ADF(2) level

ADF Test Statistic	-1.171224	1% Critical Value*	-3.4986
		5% Critical Value	-2.8912
		10% Critical Value	-2.5824

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(BELBOND)
Method: Least Squares
Date: 03/09/05 Time: 00:37
Sample(adjusted): 4 100
Included observations: 97 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
BELBOND(-1)	-0.016508	0.014094	-1.171224	0.2445
D(BELBOND(-1))	0.355768	0.103057	3.452151	0.0008
D(BELBOND(-2))	0.054366	0.104451	0.520497	0.6040
C	0.089993	0.121048	0.743450	0.4591

R-squared	0.152062	Mean dependent var	-0.072224
Adjusted R-squared	0.124710	S.D. dependent var	0.415091
S.E. of regression	0.388346	Akaike info criterion	0.986523
Sum squared resid	14.02559	Schwarz criterion	1.092697
Log likelihood	-43.84639	F-statistic	5.559298
Durbin-Watson stat	1.869007	Prob(F-statistic)	0.001490

Belgium ADF(2) 1st difference

ADF Test Statistic	-4.400717	1% Critical Value*	-3.4993
		5% Critical Value	-2.8915
		10% Critical Value	-2.5826

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(BELBOND,2)
Method: Least Squares
Date: 03/09/05 Time: 00:38
Sample(adjusted): 5 100
Included observations: 96 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(BELBOND(-1))	-0.569513	0.129414	-4.400717	0.0000
D(BELBOND(-1),2)	-0.040089	0.123396	-0.324883	0.7460
D(BELBOND(-2),2)	-0.092429	0.101921	-0.906870	0.3668
C	-0.049933	0.040220	-1.241511	0.2176

R-squared	0.319749	Mean dependent var	-0.010470
Adjusted R-squared	0.297567	S.D. dependent var	0.456232
S.E. of regression	0.382374	Akaike info criterion	0.955937
Sum squared resid	13.45129	Schwarz criterion	1.062785
Log likelihood	-41.88497	F-statistic	14.41474
Durbin-Watson stat	1.988298	Prob(F-statistic)	0.000000

Denmark ADF(2) level

ADF Test Statistic	-1.780006	1% Critical Value*	-3.5015
		5% Critical Value	-2.8925
		10% Critical Value	-2.5831

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(DENBOND)
Method: Least Squares
Date: 03/09/05 Time: 00:38
Sample(adjusted): 4 100
Included observations: 93
Excluded observations: 4 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DENBOND(-1)	-0.027200	0.015281	-1.780006	0.0785
D(DENBOND(-1))	0.429298	0.103386	4.152381	0.0001
D(DENBOND(-2))	-0.107580	0.103893	-1.035489	0.3032
C	0.150469	0.160294	0.938709	0.3504

R-squared	0.194340	Mean dependent var	-0.143166
Adjusted R-squared	0.167183	S.D. dependent var	0.745270
S.E. of regression	0.680125	Akaike info criterion	2.108978
Sum squared resid	41.16872	Schwarz criterion	2.217907
Log likelihood	-94.06746	F-statistic	7.156148
Durbin-Watson stat	1.970750	Prob(F-statistic)	0.000233

Denmark ADF(2) 1st difference

ADF Test Statistic	-4.928504	1% Critical Value*	-3.5031
		5% Critical Value	-2.8932
		10% Critical Value	-2.5834

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(DENBOND,2)
Method: Least Squares
Date: 03/09/05 Time: 00:38
Sample(adjusted): 5 100
Included observations: 91
Excluded observations: 5 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(DENBOND(-1))	-0.669723	0.135888	-4.928504	0.0000
D(DENBOND(-1),2)	0.117626	0.119781	0.982005	0.3288
D(DENBOND(-2),2)	0.000365	0.105912	0.003448	0.9973
C	-0.101128	0.075097	-1.346632	0.1816

R-squared	0.311263	Mean dependent var	-0.007553
Adjusted R-squared	0.287513	S.D. dependent var	0.820955
S.E. of regression	0.692959	Akaike info criterion	2.147269
Sum squared resid	41.77672	Schwarz criterion	2.257636
Log likelihood	-93.70073	F-statistic	13.10606
Durbin-Watson stat	2.007874	Prob(F-statistic)	0.000000

France ADF(2) level

ADF Test Statistic	-1.073449	1% Critical Value*	-3.4986
		5% Critical Value	-2.8912
		10% Critical Value	-2.5824

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(FRABOND)
Method: Least Squares
Date: 03/09/05 Time: 00:39
Sample(adjusted): 4 100
Included observations: 97 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FRABOND(-1)	-0.014569	0.013572	-1.073449	0.2858
D(FRABOND(-1))	0.476910	0.103432	4.610879	0.0000
D(FRABOND(-2))	-0.107168	0.105771	-1.013204	0.3136
C	0.069803	0.124224	0.561911	0.5755

R-squared	0.202404	Mean dependent var	-0.081548
Adjusted R-squared	0.176675	S.D. dependent var	0.494545
S.E. of regression	0.448736	Akaike info criterion	1.275600
Sum squared resid	18.72688	Schwarz criterion	1.381774
Log likelihood	-57.86661	F-statistic	7.866784
Durbin-Watson stat	1.869142	Prob(F-statistic)	0.000098

France ADF(2) 1st difference

ADF Test Statistic	-4.634722	1% Critical Value*	-3.4993
		5% Critical Value	-2.8915
		10% Critical Value	-2.5826

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(FRABOND,2)
Method: Least Squares
Date: 03/09/05 Time: 00:39
Sample(adjusted): 5 100
Included observations: 96 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(FRABOND(-1))	-0.584017	0.126009	-4.634722	0.0000
D(FRABOND(-1),2)	0.093591	0.115923	0.807355	0.4215
D(FRABOND(-2),2)	-0.122578	0.103577	-1.183450	0.2397
C	-0.058955	0.046119	-1.278322	0.2044

R-squared	0.320635	Mean dependent var	-0.011581
Adjusted R-squared	0.298482	S.D. dependent var	0.525193
S.E. of regression	0.439885	Akaike info criterion	1.236165
Sum squared resid	17.80186	Schwarz criterion	1.343013
Log likelihood	-55.33592	F-statistic	14.47352
Durbin-Watson stat	1.924915	Prob(F-statistic)	0.000000

Germany ADF(2) level

ADF Test Statistic	-1.369096	1% Critical Value*	-3.4986
		5% Critical Value	-2.8912
		10% Critical Value	-2.5824

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(GERBOND)
Method: Least Squares
Date: 03/09/05 Time: 00:39
Sample(adjusted): 4 100
Included observations: 97 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GERBOND(-1)	-0.035212	0.025719	-1.369096	0.1743
D(GERBOND(-1))	0.282925	0.100532	2.814261	0.0060
D(GERBOND(-2))	-0.056656	0.101511	-0.558133	0.5781
C	0.202013	0.172525	1.170917	0.2446

R-squared	0.090910	Mean dependent var	-0.034326
Adjusted R-squared	0.061584	S.D. dependent var	0.445184
S.E. of regression	0.431258	Akaike info criterion	1.196143
Sum squared resid	17.29648	Schwarz criterion	1.302317
Log likelihood	-54.01294	F-statistic	3.100029
Durbin-Watson stat	1.825679	Prob(F-statistic)	0.030498

Germany ADF(2) 1st difference

ADF Test Statistic	-4.960749	1% Critical Value*	-3.4993
		5% Critical Value	-2.8915
		10% Critical Value	-2.5826

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(GERBOND,2)
Method: Least Squares
Date: 03/09/05 Time: 00:40
Sample(adjusted): 5 100
Included observations: 96 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(GERBOND(-1))	-0.729052	0.146964	-4.960749	0.0000
D(GERBOND(-1),2)	0.056113	0.124693	0.450009	0.6538
D(GERBOND(-2),2)	-0.057449	0.103166	-0.556855	0.5790
C	-0.033319	0.043761	-0.761385	0.4484

R-squared	0.366158	Mean dependent var	-0.010726
Adjusted R-squared	0.345489	S.D. dependent var	0.524669
S.E. of regression	0.424467	Akaike info criterion	1.164808
Sum squared resid	16.57583	Schwarz criterion	1.271656
Log likelihood	-51.91078	F-statistic	17.71550
Durbin-Watson stat	2.045819	Prob(F-statistic)	0.000000

Greece ADF(2) level

ADF Test Statistic	0.217943	1%	Critical Value*	-3.6289
		5%	Critical Value	-2.9472
		10%	Critical Value	-2.6118

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(GREBOND)
Method: Least Squares
Date: 03/09/05 Time: 00:40
Sample(adjusted): 25 100
Included observations: 35
Excluded observations: 41 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GREBOND(-1)	0.008046	0.036920	0.217943	0.8289
D(GREBOND(-1))	-0.057637	0.166312	-0.346559	0.7313
D(GREBOND(-2))	-0.217913	0.142447	-1.529790	0.1362
C	-0.213711	0.341604	-0.625609	0.5362

R-squared	0.076597	Mean dependent var	-0.097231
Adjusted R-squared	-0.012764	S.D. dependent var	0.938584
S.E. of regression	0.944556	Akaike info criterion	2.831006
Sum squared resid	27.65774	Schwarz criterion	3.008760
Log likelihood	-45.54260	F-statistic	0.857159
Durbin-Watson stat	1.873314	Prob(F-statistic)	0.473589

Greece ADF(2) 1st difference

ADF Test Statistic	-3.534796	1%	Critical Value*	-3.6496
		5%	Critical Value	-2.9558
		10%	Critical Value	-2.6164

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(GREBOND,2)
Method: Least Squares
Date: 03/09/05 Time: 00:40
Sample(adjusted): 26 100
Included observations: 32
Excluded observations: 43 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(GREBOND(-1))	-1.333698	0.377305	-3.534796	0.0014
D(GREBOND(-1),2)	0.212964	0.270189	0.788204	0.4372
D(GREBOND(-2),2)	-0.080832	0.185905	-0.434802	0.6670
C	-0.038900	0.153672	-0.253136	0.8020

R-squared	0.671221	Mean dependent var	0.023370
Adjusted R-squared	0.635995	S.D. dependent var	1.364070
S.E. of regression	0.822982	Akaike info criterion	2.564704
Sum squared resid	18.96438	Schwarz criterion	2.747921
Log likelihood	-37.03526	F-statistic	19.05454
Durbin-Watson stat	1.902402	Prob(F-statistic)	0.000001

Ireland ADF(2) level

ADF Test Statistic	-0.465294	1% Critical Value*	-3.5213
		5% Critical Value	-2.9012
		10% Critical Value	-2.5876

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(IREBOND)
Method: Least Squares
Date: 03/09/05 Time: 00:41
Sample(adjusted): 4 76
Included observations: 73 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
IREBOND(-1)	-0.012219	0.026261	-0.465294	0.6432
D(IREBOND(-1))	0.353167	0.113616	3.108433	0.0027
D(IREBOND(-2))	-0.304455	0.113968	-2.671416	0.0094
C	0.001898	0.295992	0.006414	0.9949

R-squared	0.165906	Mean dependent var	-0.132928
Adjusted R-squared	0.129641	S.D. dependent var	0.795000
S.E. of regression	0.741680	Akaike info criterion	2.293437
Sum squared resid	37.95612	Schwarz criterion	2.418942
Log likelihood	-79.71046	F-statistic	4.574832
Durbin-Watson stat	1.803162	Prob(F-statistic)	0.005571

Ireland ADF(2) 1st difference

ADF Test Statistic	-4.281086	1% Critical Value*	-3.5226
		5% Critical Value	-2.9017
		10% Critical Value	-2.5879

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(IREBOND,2)
Method: Least Squares
Date: 03/09/05 Time: 00:41
Sample(adjusted): 5 76
Included observations: 72 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(IREBOND(-1))	-0.746034	0.174263	-4.281086	0.0001
D(IREBOND(-1),2)	0.177478	0.132602	1.338424	0.1852
D(IREBOND(-2),2)	-0.197471	0.115739	-1.706168	0.0925
C	-0.111214	0.088659	-1.254401	0.2140

R-squared	0.445950	Mean dependent var	-0.014213
Adjusted R-squared	0.421507	S.D. dependent var	0.950761
S.E. of regression	0.723137	Akaike info criterion	2.243516
Sum squared resid	35.55904	Schwarz criterion	2.369998
Log likelihood	-76.76659	F-statistic	18.24424
Durbin-Watson stat	1.919103	Prob(F-statistic)	0.000000

Italy ADF(2) level

ADF Test Statistic	-1.291254	1% Critical Value*	-3.4986
		5% Critical Value	-2.8912
		10% Critical Value	-2.5824

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(ITABOND)
Method: Least Squares
Date: 03/09/05 Time: 00:41
Sample(adjusted): 4 100
Included observations: 97 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ITABOND(-1)	-0.019884	0.015399	-1.291254	0.1998
D(ITABOND(-1))	0.403632	0.102701	3.930176	0.0002
D(ITABOND(-2))	0.017387	0.104467	0.166435	0.8682
C	0.137360	0.180568	0.760711	0.4488

R-squared	0.177275	Mean dependent var	-0.117057
Adjusted R-squared	0.150736	S.D. dependent var	0.778265
S.E. of regression	0.717214	Akaike info criterion	2.213478
Sum squared resid	47.83885	Schwarz criterion	2.319652
Log likelihood	-103.3537	F-statistic	6.679672
Durbin-Watson stat	2.000794	Prob(F-statistic)	0.000392

Italy ADF(2) 1st difference

ADF Test Statistic	-4.582568	1% Critical Value*	-3.4993
		5% Critical Value	-2.8915
		10% Critical Value	-2.5826

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(ITABOND,2)
Method: Least Squares
Date: 03/09/05 Time: 00:42
Sample(adjusted): 5 100
Included observations: 96 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(ITABOND(-1))	-0.591137	0.128997	-4.582568	0.0000
D(ITABOND(-1),2)	-0.011655	0.120927	-0.096378	0.9234
D(ITABOND(-2),2)	-0.029546	0.104512	-0.282705	0.7780
C	-0.077612	0.075571	-1.027018	0.3071

R-squared	0.305156	Mean dependent var	-0.009737
Adjusted R-squared	0.282498	S.D. dependent var	0.857610
S.E. of regression	0.726443	Akaike info criterion	2.239460
Sum squared resid	48.55016	Schwarz criterion	2.346307
Log likelihood	-103.4941	F-statistic	13.46795
Durbin-Watson stat	1.988674	Prob(F-statistic)	0.000000

Netherlands ADF(2) level

ADF Test Statistic	-1.352087	1% Critical Value*	-3.4986
		5% Critical Value	-2.8912
		10% Critical Value	-2.5824

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(NETHBOND)
Method: Least Squares
Date: 03/09/05 Time: 00:42
Sample(adjusted): 4 100
Included observations: 97 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
NETHBOND(-1)	-0.028238	0.020885	-1.352087	0.1796
D(NETHBOND(-1))	0.357655	0.102561	3.487251	0.0007
D(NETHBOND(-2))	-0.151948	0.106637	-1.424907	0.1575
C	0.153871	0.151414	1.016226	0.3122

R-squared	0.131923	Mean dependent var	-0.051339
Adjusted R-squared	0.103920	S.D. dependent var	0.399010
S.E. of regression	0.377709	Akaike info criterion	0.930978
Sum squared resid	13.26777	Schwarz criterion	1.037152
Log likelihood	-41.15245	F-statistic	4.711109
Durbin-Watson stat	1.814555	Prob(F-statistic)	0.004171

Netherlands ADF(2) 1st difference

ADF Test Statistic	-3.877757	1% Critical Value*	-3.4993
		5% Critical Value	-2.8915
		10% Critical Value	-2.5826

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(NETHBOND,2)
Method: Least Squares
Date: 03/09/05 Time: 00:42
Sample(adjusted): 5 100
Included observations: 96 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(NETHBOND(-1))	-0.538034	0.138749	-3.877757	0.0002
D(NETHBOND(-1),2)	-0.040751	0.117893	-0.345661	0.7304
D(NETHBOND(-2),2)	-0.336530	0.101197	-3.325502	0.0013
C	-0.032926	0.037305	-0.882622	0.3797

R-squared	0.433184	Mean dependent var	-0.009215
Adjusted R-squared	0.414701	S.D. dependent var	0.466371
S.E. of regression	0.356796	Akaike info criterion	0.817470
Sum squared resid	11.71192	Schwarz criterion	0.924317
Log likelihood	-35.23854	F-statistic	23.43670
Durbin-Watson stat	1.806389	Prob(F-statistic)	0.000000

Spain ADF(2) level

ADF Test Statistic	-0.930644	1% Critical Value*	-3.4986
		5% Critical Value	-2.8912
		10% Critical Value	-2.5824

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(SPABOND)
Method: Least Squares
Date: 03/09/05 Time: 00:43
Sample(adjusted): 4 100
Included observations: 97 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
SPABOND(-1)	-0.014497	0.015577	-0.930644	0.3544
D(SPABOND(-1))	0.478877	0.101299	4.727347	0.0000
D(SPABOND(-2))	-0.194183	0.103670	-1.873081	0.0642
C	0.058914	0.176652	0.333503	0.7395

R-squared	0.198803	Mean dependent var	-0.120177
Adjusted R-squared	0.172958	S.D. dependent var	0.739668
S.E. of regression	0.672667	Akaike info criterion	2.085231
Sum squared resid	42.08077	Schwarz criterion	2.191405
Log likelihood	-97.13371	F-statistic	7.692117
Durbin-Watson stat	2.035728	Prob(F-statistic)	0.000120

Spain ADF(2) 1st difference

ADF Test Statistic	-6.166077	1% Critical Value*	-3.4993
		5% Critical Value	-2.8915
		10% Critical Value	-2.5826

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(SPABOND,2)
Method: Least Squares
Date: 03/09/05 Time: 00:43
Sample(adjusted): 5 100
Included observations: 96 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(SPABOND(-1))	-0.829125	0.134466	-6.166077	0.0000
D(SPABOND(-1),2)	0.275554	0.115570	2.384309	0.0192
D(SPABOND(-2),2)	0.129155	0.104756	1.232911	0.2207
C	-0.107494	0.070578	-1.523058	0.1312

R-squared	0.347021	Mean dependent var	-0.008705
Adjusted R-squared	0.325729	S.D. dependent var	0.819600
S.E. of regression	0.673007	Akaike info criterion	2.086650
Sum squared resid	41.67028	Schwarz criterion	2.193498
Log likelihood	-96.15922	F-statistic	16.29760
Durbin-Watson stat	1.980203	Prob(F-statistic)	0.000000

UK ADF(2) level

ADF Test Statistic	-1.384389	1% Critical Value*	-3.4986
		5% Critical Value	-2.8912
		10% Critical Value	-2.5824

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(UKBOND)
Method: Least Squares
Date: 03/09/05 Time: 00:43
Sample(adjusted): 4 100
Included observations: 97 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
UKBOND(-1)	-0.024073	0.017389	-1.384389	0.1696
D(UKBOND(-1))	0.241950	0.101812	2.376437	0.0195
D(UKBOND(-2))	-0.102483	0.103968	-0.985717	0.3268
C	0.135408	0.156274	0.866477	0.3885

R-squared	0.078023	Mean dependent var	-0.079012
Adjusted R-squared	0.048282	S.D. dependent var	0.492427
S.E. of regression	0.480392	Akaike info criterion	1.411934
Sum squared resid	21.46220	Schwarz criterion	1.518107
Log likelihood	-64.47878	F-statistic	2.623404
Durbin-Watson stat	1.961202	Prob(F-statistic)	0.055166

UK ADF(2)1st difference

ADF Test Statistic	-5.102477	1% Critical Value*	-3.4993
		5% Critical Value	-2.8915
		10% Critical Value	-2.5826

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(UKBOND,2)
Method: Least Squares
Date: 03/09/05 Time: 00:44
Sample(adjusted): 5 100
Included observations: 96 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(UKBOND(-1))	-0.805094	0.157785	-5.102477	0.0000
D(UKBOND(-1),2)	0.059162	0.131506	0.449882	0.6539
D(UKBOND(-2),2)	-0.066954	0.105763	-0.633056	0.5283
C	-0.065208	0.051674	-1.261917	0.2102

R-squared	0.398306	Mean dependent var	-0.002606
Adjusted R-squared	0.378685	S.D. dependent var	0.617254
S.E. of regression	0.486542	Akaike info criterion	1.437785
Sum squared resid	21.77850	Schwarz criterion	1.544633
Log likelihood	-65.01370	F-statistic	20.30051
Durbin-Watson stat	1.964826	Prob(F-statistic)	0.000000

APPENDIX B

1.Short term real interest rates cointegrations

Austria Deposits cointegration

Dependent Variable: AUSDEP
Method: Least Squares
Date: 04/09/05 Time: 09:30
Sample(adjusted): 3 83
Included observations: 81 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GERDEP	0.345472	0.035370	9.767434	0.0000
C	1.478241	0.191372	7.724446	0.0000

R-squared	0.547026	Mean dependent var	3.198098
Adjusted R-squared	0.541292	S.D. dependent var	0.996076
S.E. of regression	0.674622	Akaike info criterion	2.075054
Sum squared resid	35.95411	Schwarz criterion	2.134176
Log likelihood	-82.03969	F-statistic	95.40277
Durbin-Watson stat	0.096892	Prob(F-statistic)	0.000000

Stationarity of residual

ADF Test Statistic	-1.739672	1% Critical Value*	-3.5153
		5% Critical Value	-2.8986
		10% Critical Value	-2.5863

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(RESID01)
Method: Least Squares
Date: 04/09/05 Time: 09:32
Sample(adjusted): 6 83
Included observations: 78 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
RESID01(-1)	-0.063083	0.036261	-1.739672	0.0861
D(RESID01(-1))	0.125624	0.114557	1.096602	0.2764
D(RESID01(-2))	0.086829	0.115131	0.754175	0.4531
C	-0.004449	0.023784	-0.187067	0.8521

R-squared	0.053662	Mean dependent var	-0.005506
Adjusted R-squared	0.015297	S.D. dependent var	0.211118
S.E. of regression	0.209497	Akaike info criterion	-0.238295
Sum squared resid	3.247782	Schwarz criterion	-0.117438
Log likelihood	13.29352	F-statistic	1.398712
Durbin-Watson stat	1.959625	Prob(F-statistic)	0.249955

Belgium Deposits cointegration

Dependent Variable: BELDEP
Method: Least Squares
Date: 04/09/05 Time: 09:33
Sample(adjusted): 1 94
Included observations: 94 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GERDEP	0.689791	0.052387	13.16733	0.0000
C	1.739493	0.275556	6.312663	0.0000

R-squared	0.653326	Mean dependent var	5.055467
Adjusted R-squared	0.649557	S.D. dependent var	1.831908
S.E. of regression	1.084456	Akaike info criterion	3.021082
Sum squared resid	108.1962	Schwarz criterion	3.075194
Log likelihood	-139.9908	F-statistic	173.3787
Durbin-Watson stat	0.161078	Prob(F-statistic)	0.000000

Stationarity of residual

ADF Test Statistic	-2.197977	1% Critical Value*	-3.5031
		5% Critical Value	-2.8932
		10% Critical Value	-2.5834

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(RESID02)
Method: Least Squares
Date: 04/09/05 Time: 09:33
Sample(adjusted): 4 94
Included observations: 91 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
RESID02(-1)	-0.095597	0.043493	-2.197977	0.0306
D(RESID02(-1))	0.153725	0.105671	1.454758	0.1493
D(RESID02(-2))	0.108855	0.105245	1.034303	0.3039
C	-0.015126	0.044487	-0.340015	0.7347

R-squared	0.067668	Mean dependent var	-0.020660
Adjusted R-squared	0.035519	S.D. dependent var	0.431217
S.E. of regression	0.423490	Akaike info criterion	1.162385
Sum squared resid	15.60287	Schwarz criterion	1.272752
Log likelihood	-48.88850	F-statistic	2.104801
Durbin-Watson stat	1.991626	Prob(F-statistic)	0.105434

Denmark Deposits cointegration

Dependent Variable: DENDEP
Method: Least Squares
Date: 04/09/05 Time: 09:33
Sample(adjusted): 2 92
Included observations: 91 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GERDEP	1.250343	0.111678	11.19599	0.0000
C	0.486346	0.589470	0.825056	0.4115

R-squared	0.584792	Mean dependent var	6.535806
Adjusted R-squared	0.580126	S.D. dependent var	3.469018
S.E. of regression	2.247842	Akaike info criterion	4.479551
Sum squared resid	449.6988	Schwarz criterion	4.534735
Log likelihood	-201.8196	F-statistic	125.3502
Durbin-Watson stat	0.071692	Prob(F-statistic)	0.000000

Stationarity of residual

ADF Test Statistic	-1.871798	1% Critical Value*	-3.5055
		5% Critical Value	-2.8943
		10% Critical Value	-2.5840

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(RESID03)
Method: Least Squares
Date: 04/09/05 Time: 09:34
Sample(adjusted): 5 92
Included observations: 88 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
RESID03(-1)	-0.049875	0.026645	-1.871798	0.0647
D(RESID03(-1))	0.366901	0.100561	3.648559	0.0005
D(RESID03(-2))	0.015874	0.101561	0.156297	0.8762
C	-0.023442	0.057323	-0.408940	0.6836

R-squared	0.176868	Mean dependent var	-0.044680
Adjusted R-squared	0.147470	S.D. dependent var	0.577394
S.E. of regression	0.533122	Akaike info criterion	1.624257
Sum squared resid	23.87443	Schwarz criterion	1.736864
Log likelihood	-67.46732	F-statistic	6.016403
Durbin-Watson stat	2.010668	Prob(F-statistic)	0.000919

France Deposits cointegration

Dependent Variable: FRADEP
Method: Least Squares
Date: 04/09/05 Time: 09:35
Sample(adjusted): 1 94
Included observations: 94 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GERDEP	0.492302	0.066359	7.418814	0.0000
C	2.430286	0.349050	6.962575	0.0000

R-squared	0.374315	Mean dependent var	4.796889
Adjusted R-squared	0.367514	S.D. dependent var	1.727285
S.E. of regression	1.373693	Akaike info criterion	3.493929
Sum squared resid	173.6069	Schwarz criterion	3.548042
Log likelihood	-162.2147	F-statistic	55.03880
Durbin-Watson stat	0.060134	Prob(F-statistic)	0.000000

Stationarity of residual

ADF Test Statistic	-1.515498	1% Critical Value*	-3.5031
		5% Critical Value	-2.8932
		10% Critical Value	-2.5834

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(RESID04)
Method: Least Squares
Date: 04/09/05 Time: 09:35
Sample(adjusted): 4 94
Included observations: 91 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
RESID04(-1)	-0.035811	0.023630	-1.515498	0.1333
D(RESID04(-1))	0.460809	0.103745	4.441745	0.0000
D(RESID04(-2))	-0.167180	0.103808	-1.610474	0.1109
C	-0.011378	0.031767	-0.358178	0.7211

R-squared	0.199426	Mean dependent var	-0.016256
Adjusted R-squared	0.171820	S.D. dependent var	0.332627
S.E. of regression	0.302705	Akaike info criterion	0.490846
Sum squared resid	7.971847	Schwarz criterion	0.601213
Log likelihood	-18.33348	F-statistic	7.224020
Durbin-Watson stat	1.979299	Prob(F-statistic)	0.000220

Greece Deposits cointergration

Dependent Variable: GREDEP
Method: Least Squares
Date: 04/09/05 Time: 09:36
Sample(adjusted): 1 94
Included observations: 94 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GERDEP	1.334528	0.206331	6.467894	0.0000
C	7.282386	1.085313	6.709938	0.0000

R-squared	0.312579	Mean dependent var	13.69775
Adjusted R-squared	0.305108	S.D. dependent var	5.123874
S.E. of regression	4.271272	Akaike info criterion	5.762747
Sum squared resid	1678.426	Schwarz criterion	5.816860
Log likelihood	-268.8491	F-statistic	41.83365
Durbin-Watson stat	0.038236	Prob(F-statistic)	0.000000

Stationarity of residual

ADF Test Statistic	-0.888775	1% Critical Value*	-3.5031
		5% Critical Value	-2.8932
		10% Critical Value	-2.5834

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(RESID05)
Method: Least Squares
Date: 04/09/05 Time: 09:37
Sample(adjusted): 4 94
Included observations: 91 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
RESID05(-1)	-0.016819	0.018924	-0.888775	0.3766
D(RESID05(-1))	0.565486	0.103632	5.456651	0.0000
D(RESID05(-2))	-0.140842	0.105845	-1.330646	0.1868
C	-0.026146	0.076394	-0.342248	0.7330

R-squared	0.265474	Mean dependent var	-0.041978
Adjusted R-squared	0.240145	S.D. dependent var	0.832918
S.E. of regression	0.726052	Akaike info criterion	2.240570
Sum squared resid	45.86218	Schwarz criterion	2.350938
Log likelihood	-97.94595	F-statistic	10.48124
Durbin-Watson stat	1.903873	Prob(F-statistic)	0.000006

Ireland Deposits cointergration

Dependent Variable: IREDEP
Method: Least Squares
Date: 04/09/05 Time: 09:38
Sample(adjusted): 1 94
Included observations: 94 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GERDEP	1.393119	0.143170	9.730506	0.0000
C	-2.381622	0.753084	-3.162491	0.0021

R-squared	0.507185	Mean dependent var	4.315405
Adjusted R-squared	0.501829	S.D. dependent var	4.199099
S.E. of regression	2.963777	Akaike info criterion	5.031853
Sum squared resid	808.1254	Schwarz criterion	5.085965
Log likelihood	-234.4971	F-statistic	94.68275
Durbin-Watson stat	0.108868	Prob(F-statistic)	0.000000

Stationarity of residual

ADF Test Statistic	-1.701266	1% Critical Value*	-3.5031
		5% Critical Value	-2.8932
		10% Critical Value	-2.5834

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(RESID06)
Method: Least Squares
Date: 04/09/05 Time: 09:39
Sample(adjusted): 4 94
Included observations: 91 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
RESID06(-1)	-0.057614	0.033865	-1.701266	0.0925
D(RESID06(-1))	0.265275	0.100575	2.637580	0.0099
D(RESID06(-2))	-0.279924	0.101870	-2.747866	0.0073
C	-0.047378	0.096599	-0.490462	0.6250

R-squared	0.158364	Mean dependent var	-0.041775
Adjusted R-squared	0.129342	S.D. dependent var	0.985215
S.E. of regression	0.919295	Akaike info criterion	2.712540
Sum squared resid	73.52393	Schwarz criterion	2.822908
Log likelihood	-119.4206	F-statistic	5.456706
Durbin-Watson stat	1.896277	Prob(F-statistic)	0.001746

Italy Deposits cointergration

Dependent Variable: ITADEP
Method: Least Squares
Date: 04/09/05 Time: 09:39
Sample(adjusted): 9 94
Included observations: 86 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GERDEP	1.095708	0.188532	5.811798	0.0000
C	1.765092	0.903349	1.953943	0.0540

R-squared	0.286788	Mean dependent var	6.626961
Adjusted R-squared	0.278297	S.D. dependent var	3.721439
S.E. of regression	3.161478	Akaike info criterion	5.162937
Sum squared resid	839.5751	Schwarz criterion	5.220015
Log likelihood	-220.0063	F-statistic	33.77699
Durbin-Watson stat	0.026080	Prob(F-statistic)	0.000000

Stationarity of residual

ADF Test Statistic	-2.124134	1% Critical Value*	-3.5101
		5% Critical Value	-2.8963
		10% Critical Value	-2.5851

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(RESID07)
Method: Least Squares
Date: 04/09/05 Time: 09:40
Sample(adjusted): 12 94
Included observations: 83 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
RESID07(-1)	-0.033169	0.015616	-2.124134	0.0368
D(RESID07(-1))	0.317983	0.107550	2.956599	0.0041
D(RESID07(-2))	0.169281	0.105506	1.604459	0.1126
C	-0.060304	0.048871	-1.233935	0.2209

R-squared	0.218341	Mean dependent var	-0.101686
Adjusted R-squared	0.188657	S.D. dependent var	0.483705
S.E. of regression	0.435695	Akaike info criterion	1.223246
Sum squared resid	14.99661	Schwarz criterion	1.339817
Log likelihood	-46.76471	F-statistic	7.355677
Durbin-Watson stat	2.059973	Prob(F-statistic)	0.000207

Netherlands Deposits cointegration

Dependent Variable: NETDEP
Method: Least Squares
Date: 04/09/05 Time: 09:41
Sample(adjusted): 5 94
Included observations: 90 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GERDEP	0.231194	0.038620	5.986382	0.0000
C	2.591304	0.197417	13.12603	0.0000

R-squared	0.289387	Mean dependent var	3.671068
Adjusted R-squared	0.281312	S.D. dependent var	0.898052
S.E. of regression	0.761328	Akaike info criterion	2.314466
Sum squared resid	51.00656	Schwarz criterion	2.370017
Log likelihood	-102.1510	F-statistic	35.83677
Durbin-Watson stat	0.127757	Prob(F-statistic)	0.000000

Stationarity of residual

ADF Test Statistic	-2.202218	1% Critical Value*	-3.5064
		5% Critical Value	-2.8947
		10% Critical Value	-2.5842

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(RESID01)
Method: Least Squares
Date: 04/09/05 Time: 09:42
Sample(adjusted): 8 94
Included observations: 87 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
RESID01(-1)	-0.087267	0.039627	-2.202218	0.0304
D(RESID01(-1))	0.104712	0.107782	0.971516	0.3341
D(RESID01(-2))	0.097440	0.106854	0.911899	0.3645
C	-0.014332	0.028845	-0.496865	0.6206

R-squared	0.063725	Mean dependent var	-0.016249
Adjusted R-squared	0.029884	S.D. dependent var	0.271917
S.E. of regression	0.267823	Akaike info criterion	0.247908
Sum squared resid	5.953534	Schwarz criterion	0.361283
Log likelihood	-6.783991	F-statistic	1.883057
Durbin-Watson stat	1.991664	Prob(F-statistic)	0.138770

Spain Deposits cointergration

Dependent Variable: SPADEP
Method: Least Squares
Date: 04/09/05 Time: 09:42
Sample(adjusted): 9 93
Included observations: 85 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GERDEP	1.374294	0.151903	9.047176	0.0000
C	1.499331	0.731464	2.049766	0.0435

R-squared	0.496516	Mean dependent var	7.638869
Adjusted R-squared	0.490450	S.D. dependent var	3.525843
S.E. of regression	2.516844	Akaike info criterion	4.707137
Sum squared resid	525.7638	Schwarz criterion	4.764611
Log likelihood	-198.0533	F-statistic	81.85140
Durbin-Watson stat	0.050632	Prob(F-statistic)	0.000000

Stationarity of residual

ADF Test Statistic	-1.887995	1% Critical Value*	-3.5111
		5% Critical Value	-2.8967
		10% Critical Value	-2.5853

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(RESID02)
Method: Least Squares
Date: 04/09/05 Time: 09:43
Sample(adjusted): 12 93
Included observations: 82 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
RESID02(-1)	-0.039456	0.020899	-1.887995	0.0627
D(RESID02(-1))	0.474569	0.110149	4.308438	0.0000
D(RESID02(-2))	0.135068	0.107877	1.252056	0.2143
C	-0.016336	0.050896	-0.320971	0.7491

R-squared	0.315988	Mean dependent var	-0.034204
Adjusted R-squared	0.289680	S.D. dependent var	0.545801
S.E. of regression	0.460004	Akaike info criterion	1.332385
Sum squared resid	16.50505	Schwarz criterion	1.449786
Log likelihood	-50.62780	F-statistic	12.01101
Durbin-Watson stat	1.670698	Prob(F-statistic)	0.000002

UK Deposits cointergration

Dependent Variable: UKDEP
Method: Least Squares
Date: 04/09/05 Time: 09:43
Sample(adjusted): 1 76
Included observations: 76 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GERDEP	0.934521	0.166306	5.619279	0.0000
C	3.407775	0.943068	3.613497	0.0005

R-squared	0.299085	Mean dependent var	8.325666
Adjusted R-squared	0.289613	S.D. dependent var	3.633943
S.E. of regression	3.062849	Akaike info criterion	5.102531
Sum squared resid	694.1972	Schwarz criterion	5.163866
Log likelihood	-191.8962	F-statistic	31.57629
Durbin-Watson stat	0.181619	Prob(F-statistic)	0.000000

Stationarity of residual

ADF Test Statistic	-2.220944	1% Critical Value*	-3.5213
		5% Critical Value	-2.9012
		10% Critical Value	-2.5876

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(RESID03)
Method: Least Squares
Date: 04/09/05 Time: 09:44
Sample(adjusted): 4 76
Included observations: 73 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
RESID03(-1)	-0.115466	0.051989	-2.220944	0.0296
D(RESID03(-1))	0.246312	0.116754	2.109673	0.0385
D(RESID03(-2))	-0.062818	0.118743	-0.529028	0.5985
C	-0.064406	0.148876	-0.432618	0.6666

R-squared	0.112409	Mean dependent var	-0.066469
Adjusted R-squared	0.073818	S.D. dependent var	1.317811
S.E. of regression	1.268240	Akaike info criterion	3.366373
Sum squared resid	110.9818	Schwarz criterion	3.491878
Log likelihood	-118.8726	F-statistic	2.912844
Durbin-Watson stat	1.993624	Prob(F-statistic)	0.040446

2. Long term real interest rates cointegrations

Austria bond cointergration

Dependent Variable: AUSBOND
Method: Least Squares
Date: 04/09/05 Time: 09:17
Sample(adjusted): 1 83
Included observations: 83 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GERBOND	1.036738	0.035584	29.13488	0.0000
C	0.036976	0.251950	0.146757	0.8837

R-squared	0.912888	Mean dependent var	7.183793
Adjusted R-squared	0.911813	S.D. dependent var	1.764029
S.E. of regression	0.523852	Akaike info criterion	1.568585
Sum squared resid	22.22807	Schwarz criterion	1.626870
Log likelihood	-63.09628	F-statistic	848.8410
Durbin-Watson stat	0.306701	Prob(F-statistic)	0.000000

Stationarity of residual

ADF Test Statistic	-2.540517	1% Critical Value*	-3.5132
		5% Critical Value	-2.8976
		10% Critical Value	-2.5858

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(RESID01)
Method: Least Squares
Date: 04/09/05 Time: 09:17
Sample(adjusted): 4 83
Included observations: 80 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
RESID01(-1)	-0.145992	0.057466	-2.540517	0.0131
D(RESID01(-1))	0.178778	0.100213	1.783978	0.0784
D(RESID01(-2))	-0.158462	0.101076	-1.567744	0.1211
C	-0.013424	0.027306	-0.491609	0.6244

R-squared	0.152834	Mean dependent var	-0.015112
Adjusted R-squared	0.119393	S.D. dependent var	0.260216
S.E. of regression	0.244188	Akaike info criterion	0.066953
Sum squared resid	4.531727	Schwarz criterion	0.186055
Log likelihood	1.321864	F-statistic	4.570275
Durbin-Watson stat	1.906051	Prob(F-statistic)	0.005366

Belgium bond cointegration

Dependent Variable: BELBOND
Method: Least Squares
Date: 04/09/05 Time: 09:18
Sample: 1 100
Included observations: 100

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GERBOND	1.505625	0.063425	23.73860	0.0000
C	-1.673981	0.425441	-3.934696	0.0002

R-squared	0.851857	Mean dependent var	8.075959
Adjusted R-squared	0.850345	S.D. dependent var	2.867830
S.E. of regression	1.109428	Akaike info criterion	3.065363
Sum squared resid	120.6214	Schwarz criterion	3.117467
Log likelihood	-151.2682	F-statistic	563.5212
Durbin-Watson stat	0.196380	Prob(F-statistic)	0.000000

Stationarity of residual

ADF Test Statistic	-2.306942	1% Critical Value*	-3.4986
		5% Critical Value	-2.8912
		10% Critical Value	-2.5824

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(RESID02)
Method: Least Squares
Date: 04/09/05 Time: 09:18
Sample(adjusted): 4 100
Included observations: 97 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
RESID02(-1)	-0.105054	0.045538	-2.306942	0.0233
D(RESID02(-1))	0.098977	0.099913	0.990632	0.3244
D(RESID02(-2))	-0.078231	0.102286	-0.764828	0.4463
C	-0.021084	0.047823	-0.440868	0.6603

R-squared	0.074463	Mean dependent var	-0.020542
Adjusted R-squared	0.044606	S.D. dependent var	0.481517
S.E. of regression	0.470655	Akaike info criterion	1.370980
Sum squared resid	20.60100	Schwarz criterion	1.477153
Log likelihood	-62.49252	F-statistic	2.494051
Durbin-Watson stat	1.981927	Prob(F-statistic)	0.064783

Denmark bond cointergration

Dependent Variable: DENBOND
Method: Least Squares
Date: 04/09/05 Time: 09:19
Sample: 1 100
Included observations: 99
Excluded observations: 1

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GERBOND	2.319038	0.141339	16.40765	0.0000
C	-5.791726	0.950481	-6.093469	0.0000

R-squared	0.735125	Mean dependent var	9.266726
Adjusted R-squared	0.732395	S.D. dependent var	4.754797
S.E. of regression	2.459684	Akaike info criterion	4.657938
Sum squared resid	586.8545	Schwarz criterion	4.710365
Log likelihood	-228.5679	F-statistic	269.2109
Durbin-Watson stat	0.174811	Prob(F-statistic)	0.000000

Stationarity of residual

ADF Test Statistic	-3.147907	1% Critical Value*	-3.5015
		5% Critical Value	-2.8925
		10% Critical Value	-2.5831

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(RESID03)
Method: Least Squares
Date: 04/09/05 Time: 09:19
Sample(adjusted): 4 100
Included observations: 93
Excluded observations: 4 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
RESID03(-1)	-0.130752	0.041536	-3.147907	0.0022
D(RESID03(-1))	0.226087	0.096571	2.341140	0.0215
D(RESID03(-2))	0.011152	0.099201	0.112420	0.9107
C	-0.070961	0.097704	-0.726288	0.4696

R-squared	0.132901	Mean dependent var	-0.077738
Adjusted R-squared	0.103673	S.D. dependent var	0.993485
S.E. of regression	0.940577	Akaike info criterion	2.757412
Sum squared resid	78.73699	Schwarz criterion	2.866341
Log likelihood	-124.2197	F-statistic	4.547049
Durbin-Watson stat	1.793331	Prob(F-statistic)	0.005181

France bond cointergration

Dependent Variable: FRABOND
Method: Least Squares
Date: 04/09/05 Time: 09:20
Sample: 1 100
Included observations: 100

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GERBOND	1.724224	0.092289	18.68298	0.0000
C	-2.703510	0.619049	-4.367197	0.0000

R-squared	0.780787	Mean dependent var	8.462007
Adjusted R-squared	0.778550	S.D. dependent var	3.430420
S.E. of regression	1.614303	Akaike info criterion	3.815481
Sum squared resid	255.3856	Schwarz criterion	3.867585
Log likelihood	-188.7741	F-statistic	349.0536
Durbin-Watson stat	0.120974	Prob(F-statistic)	0.000000

Stationarity of residual

ADF Test Statistic	-2.009262	1% Critical Value*	-3.4986
		5% Critical Value	-2.8912
		10% Critical Value	-2.5824

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(RESID04)
Method: Least Squares
Date: 04/09/05 Time: 09:21
Sample(adjusted): 4 100
Included observations: 97 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
RESID04(-1)	-0.070498	0.035087	-2.009262	0.0474
D(RESID04(-1))	0.107989	0.099164	1.088991	0.2790
D(RESID04(-2))	0.003024	0.101535	0.029787	0.9763
C	-0.021643	0.054924	-0.394056	0.6944

R-squared	0.048541	Mean dependent var	-0.022361
Adjusted R-squared	0.017849	S.D. dependent var	0.545524
S.E. of regression	0.540634	Akaike info criterion	1.648214
Sum squared resid	27.18252	Schwarz criterion	1.754388
Log likelihood	-75.93839	F-statistic	1.581542
Durbin-Watson stat	1.944249	Prob(F-statistic)	0.199107

Greece bond cointergration

Dependent Variable: GREBOND
Method: Least Squares
Date: 04/09/05 Time: 09:23
Sample(adjusted): 22 100
Included observations: 44
Excluded observations: 35 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GERBOND	4.490398	0.521207	8.615385	0.0000
C	-13.39449	2.659261	-5.036924	0.0000

R-squared	0.638632	Mean dependent var	9.172818
Adjusted R-squared	0.630028	S.D. dependent var	5.001117
S.E. of regression	3.041948	Akaike info criterion	5.107262
Sum squared resid	388.6447	Schwarz criterion	5.188362
Log likelihood	-110.3598	F-statistic	74.22486
Durbin-Watson stat	0.472015	Prob(F-statistic)	0.000000

Stationarity of residual

ADF Test Statistic	-1.571096	1% Critical Value*	-3.6289
		5% Critical Value	-2.9472
		10% Critical Value	-2.6118

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(RESID05)
Method: Least Squares
Date: 04/09/05 Time: 09:24
Sample(adjusted): 25 100
Included observations: 35
Excluded observations: 41 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
RESID05(-1)	-0.211700	0.134747	-1.571096	0.1263
D(RESID05(-1))	0.061422	0.179879	0.341465	0.7351
D(RESID05(-2))	-0.099081	0.169186	-0.585635	0.5624
C	-0.024796	0.325605	-0.076154	0.9398

R-squared	0.121666	Mean dependent var	0.036847
Adjusted R-squared	0.036666	S.D. dependent var	1.952122
S.E. of regression	1.915999	Akaike info criterion	4.245566
Sum squared resid	113.8027	Schwarz criterion	4.423320
Log likelihood	-70.29741	F-statistic	1.431366
Durbin-Watson stat	1.835685	Prob(F-statistic)	0.252442

Ireland bond cointergration

Dependent Variable: IREBOND
Method: Least Squares
Date: 04/09/05 Time: 09:24
Sample(adjusted): 1 76
Included observations: 76 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GERBOND	1.690128	0.180138	9.382420	0.0000
C	-1.355552	1.307618	-1.036658	0.3033

R-squared	0.543294	Mean dependent var	10.63999
Adjusted R-squared	0.537122	S.D. dependent var	3.515473
S.E. of regression	2.391757	Akaike info criterion	4.607897
Sum squared resid	423.3170	Schwarz criterion	4.669232
Log likelihood	-173.1001	F-statistic	88.02980
Durbin-Watson stat	0.115745	Prob(F-statistic)	0.000000

Stationarity of residual

ADF Test Statistic	-1.580635	1% Critical Value*	-3.5213
		5% Critical Value	-2.9012
		10% Critical Value	-2.5876

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(RESID07)
Method: Least Squares
Date: 04/09/05 Time: 09:25
Sample(adjusted): 4 76
Included observations: 73 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
RESID07(-1)	-0.062389	0.039471	-1.580635	0.1185
D(RESID07(-1))	0.253624	0.114822	2.208846	0.0305
D(RESID07(-2))	-0.225677	0.114969	-1.962944	0.0537
C	-0.047667	0.091062	-0.523449	0.6023

R-squared	0.131887	Mean dependent var	-0.041348
Adjusted R-squared	0.094142	S.D. dependent var	0.814780
S.E. of regression	0.775480	Akaike info criterion	2.382566
Sum squared resid	41.49443	Schwarz criterion	2.508071
Log likelihood	-82.96366	F-statistic	3.494232
Durbin-Watson stat	1.948918	Prob(F-statistic)	0.020083

Italy bond cointergration

Dependent Variable: ITABOND
Method: Least Squares
Date: 04/09/05 Time: 09:25
Sample: 1 100
Included observations: 100

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GERBOND	2.484746	0.119263	20.83409	0.0000
C	-5.476909	0.799991	-6.846213	0.0000
R-squared	0.815810	Mean dependent var	10.61350	
Adjusted R-squared	0.813930	S.D. dependent var	4.836235	
S.E. of regression	2.086147	Akaike info criterion	4.328312	
Sum squared resid	426.4971	Schwarz criterion	4.380416	
Log likelihood	-214.4156	F-statistic	434.0593	
Durbin-Watson stat	0.262773	Prob(F-statistic)	0.000000	

Stationarity of residual

ADF Test Statistic	-2.720991	1% Critical Value*	-3.4986
		5% Critical Value	-2.8912
		10% Critical Value	-2.5824

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(RESID08)
Method: Least Squares
Date: 04/09/05 Time: 09:25
Sample(adjusted): 4 100
Included observations: 97 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
RESID08(-1)	-0.143500	0.052738	-2.720991	0.0078
D(RESID08(-1))	0.071063	0.099027	0.717609	0.4748
D(RESID08(-2))	0.057789	0.099729	0.579462	0.5637
C	-0.026885	0.102435	-0.262454	0.7936
R-squared	0.074027	Mean dependent var	-0.031765	
Adjusted R-squared	0.044157	S.D. dependent var	1.031656	
S.E. of regression	1.008622	Akaike info criterion	2.895409	
Sum squared resid	94.61052	Schwarz criterion	3.001583	
Log likelihood	-136.4273	F-statistic	2.478312	
Durbin-Watson stat	1.938199	Prob(F-statistic)	0.066061	

Netherlands bond cointergration

Dependent Variable: NETHBOND
Method: Least Squares
Date: 04/09/05 Time: 09:26
Sample: 1 100
Included observations: 100

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GERBOND	1.061619	0.022891	46.37798	0.0000
C	0.128016	0.153545	0.833740	0.4065

R-squared	0.956423	Mean dependent var	7.002719
Adjusted R-squared	0.955979	S.D. dependent var	1.908374
S.E. of regression	0.400400	Akaike info criterion	1.027093
Sum squared resid	15.71140	Schwarz criterion	1.079197
Log likelihood	-49.35466	F-statistic	2150.917
Durbin-Watson stat	0.429098	Prob(F-statistic)	0.000000

Stationarity of residual

ADF Test Statistic	-3.614573	1% Critical Value*	-3.4986
		5% Critical Value	-2.8912
		10% Critical Value	-2.5824

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(RESID09)
Method: Least Squares
Date: 04/09/05 Time: 09:26
Sample(adjusted): 4 100
Included observations: 97 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
RESID09(-1)	-0.238295	0.065926	-3.614573	0.0005
D(RESID09(-1))	-0.175839	0.100057	-1.757386	0.0821
D(RESID09(-2))	-0.137994	0.102661	-1.344177	0.1822
C	-0.023363	0.023317	-1.001955	0.3190

R-squared	0.217847	Mean dependent var	-0.014897
Adjusted R-squared	0.192616	S.D. dependent var	0.254095
S.E. of regression	0.228316	Akaike info criterion	-0.075813
Sum squared resid	4.847905	Schwarz criterion	0.030361
Log likelihood	7.676931	F-statistic	8.634195
Durbin-Watson stat	2.087011	Prob(F-statistic)	0.000041

Spain bond cointergration

Dependent Variable: SPABOND
Method: Least Squares
Date: 04/09/05 Time: 09:26
Sample: 1 100
Included observations: 100

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GERBOND	2.264343	0.122389	18.50124	0.0000
C	-4.334878	0.820954	-5.280293	0.0000

R-squared	0.777422	Mean dependent var	10.32828
Adjusted R-squared	0.775151	S.D. dependent var	4.514748
S.E. of regression	2.140813	Akaike info criterion	4.380046
Sum squared resid	449.1420	Schwarz criterion	4.432149
Log likelihood	-217.0023	F-statistic	342.2960
Durbin-Watson stat	0.256149	Prob(F-statistic)	0.000000

Stationarity of residual

ADF Test Statistic	-2.828870	1% Critical Value*	-3.4986
		5% Critical Value	-2.8912
		10% Critical Value	-2.5824

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(RESID10)
Method: Least Squares
Date: 04/09/05 Time: 09:27
Sample(adjusted): 4 100
Included observations: 97 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
RESID10(-1)	-0.149641	0.052898	-2.828870	0.0057
D(RESID10(-1))	0.180811	0.099197	1.822750	0.0716
D(RESID10(-2))	-0.003174	0.101757	-0.031187	0.9752
C	-0.036807	0.104254	-0.353049	0.7249

R-squared	0.097751	Mean dependent var	-0.042451
Adjusted R-squared	0.068646	S.D. dependent var	1.063067
S.E. of regression	1.025930	Akaike info criterion	2.929439
Sum squared resid	97.88555	Schwarz criterion	3.035613
Log likelihood	-138.0778	F-statistic	3.358582
Durbin-Watson stat	1.924233	Prob(F-statistic)	0.022117

UK bond cointergration

Dependent Variable: UKBOND
Method: Least Squares
Date: 04/09/05 Time: 09:27
Sample: 1 100
Included observations: 100

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GERBOND	1.498395	0.070711	21.19042	0.0000
C	-1.136772	0.474312	-2.396674	0.0184

R-squared	0.820852	Mean dependent var	8.566353
Adjusted R-squared	0.819024	S.D. dependent var	2.907461
S.E. of regression	1.236871	Akaike info criterion	3.282844
Sum squared resid	149.9253	Schwarz criterion	3.334947
Log likelihood	-162.1422	F-statistic	449.0338
Durbin-Watson stat	0.223312	Prob(F-statistic)	0.000000

Stationarity of residual

ADF Test Statistic	-2.992473	1% Critical Value*	-3.4986
		5% Critical Value	-2.8912
		10% Critical Value	-2.5824

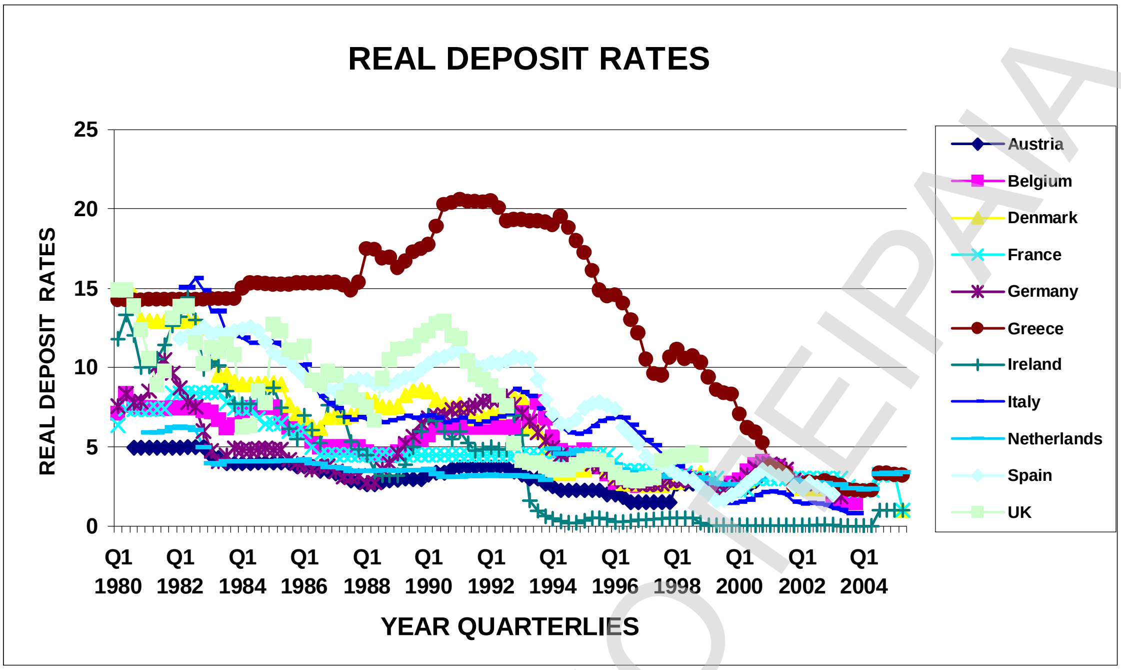
*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(RESID11)
Method: Least Squares
Date: 04/09/05 Time: 09:27
Sample(adjusted): 4 100
Included observations: 97 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
RESID11(-1)	-0.149487	0.049954	-2.992473	0.0035
D(RESID11(-1))	0.078690	0.100559	0.782526	0.4359
D(RESID11(-2))	-0.014107	0.101602	-0.138844	0.8899
C	-0.033103	0.057440	-0.576306	0.5658

R-squared	0.093420	Mean dependent var	-0.027578
Adjusted R-squared	0.064175	S.D. dependent var	0.582913
S.E. of regression	0.563899	Akaike info criterion	1.732480
Sum squared resid	29.57234	Schwarz criterion	1.838653
Log likelihood	-80.02527	F-statistic	3.194430
Durbin-Watson stat	1.933710	Prob(F-statistic)	0.027121

APPENDIX C


REAL DEPOSIT RATES
REAL DEPOSIT RATES
YEAR QUARTERLIES
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Q1 1982
Q1 1984
Q1 1986
Q1 1988
Q1 1990
Q1 1992
Q1 1994
Q1 1996
Q1 1998
Q1 2000
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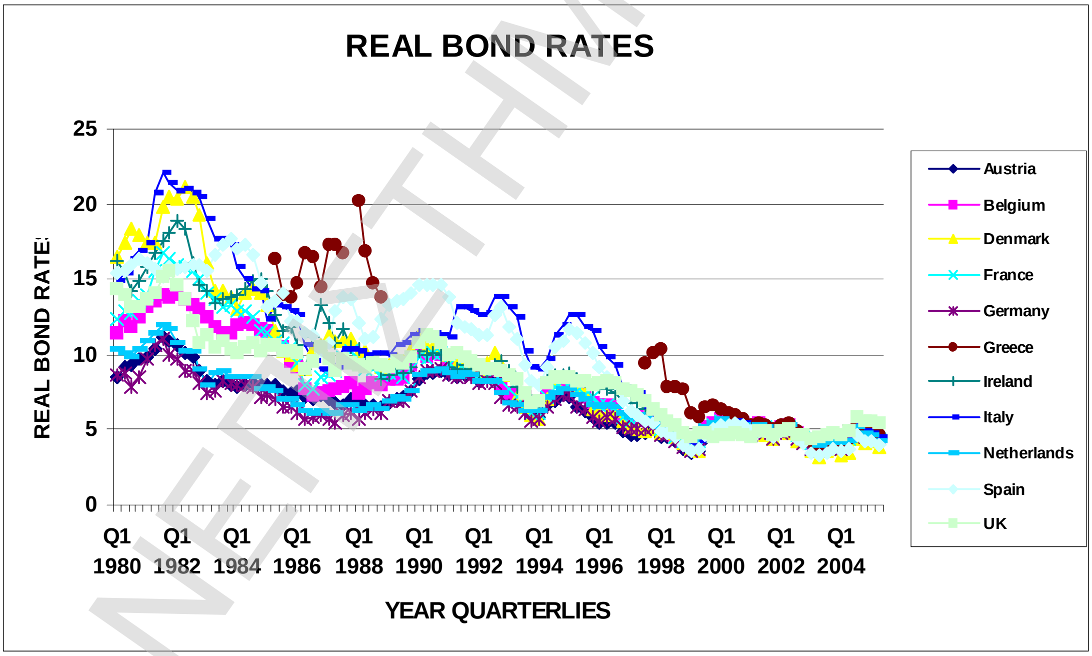
Q1 2004
Austria
Belgium
Denmark
France
Germany
Greece
Ireland
Italy
Netherlands
Spain
UK


REAL BOND RATES
REAL BOND RATE
YEAR QUARTERLIES
Q1 1980
Q1 1982
Q1 1984
Q1 1986
Q1 1988
Q1 1990
Q1 1992
Q1 1994
Q1 1996
Q1 1998
Q1 2000
Q1 2002
Q1 2004
Austria
Belgium
Denmark
France
Germany
Greece
Ireland
Italy
Netherlands
Spain
UK