Risk Premiums on Governments Bonds: A Cointegration Approach and Error Correction Model

by

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Abstract

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In this thesis we investigated the long-run relationships among risk premiums for long-run government bonds of seventeen countries from four regions (East Europe, East Asia, Africa and Latin America). To do this I applied the cointegration test determining the long-run dynamics among the risk premiums, while also employing a vector error correction model that abstracts simultaneously the short-run and long-run information about the relationships. Causality tests were also performed to determine the influence of each risk premium on others.

The results indicated that there is a strong long-run relationship among the risk premiums for each region. In other words, the risk premiums in each region are cointegrated. At the same time we can apply this cointegration method to test the theory of Market Efficiency in the bonds market for these four different regions. The absence of cointegration (absence of a long-run equilibrium) would suggest that the government bonds market is consistent with the Efficient Market Hypothesis. However, the results suggested that the emerging bond markets in each region I investigate have inefficient and predictable markets (it is possible to forecast the risk premium /risk spread), indicating that the Efficient Market Hypothesis does not hold in these specific markets.

After establishing that the countries, as a group in the government bonds markets were cointegrated, we next employed a Vector Error Correction Model (VECM) to tie the short-run behavior of each series to its long-run values. In general, from the VECM the coefficients that represented the speed-of-adjustment parameters were higher in East Europe than the other three regions of Latin America, Africa and East Asia, and because of this the values adjusted relatively faster to changes in the equilibrium relationship. When we observed the different cointegrating vectors, there appeared to be a fairly regular cyclical component that may be related to the business cycle. Upon comparing the cointegrating vectors in different regions that capture the long-run stationary relationship among the risk premiums, we saw that the East Asian market has less fluctuation compared with the fluctuation in the Eastern Europe and Latin American markets. The Eastern Europe and Latin American markets were more volatile, with the highest fluctuation being in the Latin American market.

By performing a causality test, we found that risk premium shocks were transmitted from large countries, with large economies, to smaller economies. For the overall period of study, Brazil, Mexico and Russia, played an influential role in their regions.

To obtain additional insights into the short-run transmission mechanisms among risk premiums, impulse response functions were computed. The impulse response functions showed that almost always shocks worked through the system very quickly. We also saw that the sharpest and most volatile responses occurred between day zero and day two, and that these responses were positive.

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I especially want to thank my advisor, Professor Salih Neftci, who awakened my interest in Financial Engineering. In him, I found not only a source of knowledge and encouragement but also a great friend.

The quality of this paper would have been inferior without the enthusiastic input of the members of my dissertation committee: Michael Grossman, Salih Neftci and Thom Thurston. I own an immeasurable debt to Professor Michael Grossman. As a human being, his evenhandedness and compassion are unsurpassed.

The dissertation is dedicated to my Parents and to my grandfather Onisiforo Theodorou, from whom I inherited a love of life, perseverance and a perspective on the world. I thank them for their unconditional love. I also feel grateful to the many friends who have been supportive of me during many difficult moments.

"In my study all these years I have not succeeded in answering all my problems. The answer I have found only serve to raise a whole set of new questions. In some ways I feel I am as confused as ever, but I believe I am confused on a higher level and about more important things."

Posted outside the economics department,
Columbia University

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Chapter 1

1. Introduction

The degree of integration among different economies is an important issue in international finance. The existence of linkages across different national bond and stock markets has important implications for investors who are seeking for diversification of international opportunities. When such linkages suggest co-movements among different markets, any one market would be a representation of the behavior of that group of markets, and this would effectively amount to a reduced scope of possibilities for portfolio diversification. This implication has sparked interest in innumerable studies to investigate whether different markets are interrelated. Especially in the last few years we experienced a series of major financial crises in the emerging market economies of Asia, Latin America and Eastern Europe. This has raised important questions concerning the stability of the international financial system and caused widespread fear of the perverse impact that these financial crises would have on other countries. Primary crises that began with Mexico in the mid -1990s continued in East Asia in the late 1990s. The financial and currency crises that began in Thailand in 1997 spread around the world[1]. All these crises are a warning and a challenge to officials, to private market participants, and to economic researchers. We want to understand how the risk of such crises, or risk at any time, might be reduced and how the crises that occur could be managed in a way that does less damage in both the short-run and the more distant future. For more about financial crises in emerging market economies see Feldstein (2003).

In this study we looked more specifically for patterns in the government bonds market inter-relationships over time for different regions. We especially focused on

[1] The events that began in Thailand in 1997 eventually enveloped several countries of East Asia (The Philippines, Malaysia, Indonesia, South Korea), as well as Russia (1998), Turkey (2000), and key Latin American economies (Brazil in 1998-99, Argentina in 2000).

the risk premiums that these governments bonds had, looking for the inter-relationships among them.

This thesis employs daily market data for risk premiums from the period of 1999 through 2002 for countries in four different regions,[2] and tries to investigate the long-run behavior among risk premiums. We use the Johansen (1991, 1995) cointegration methodology[3] and try to find the existence of cointegrating vectors that supports the view that there are long-run stationary relationships among risk premiums across countries in each region. If they do exist we will fully estimate these long-run equilibrium relationships[4].

After investigating the relationship among countries in each region, by applying the cointegration test and determining the long run dynamics among risk premiums, the causality test is also performed, determining the influence of each risk premium on the other. Understanding the movement of risk premiums help us for investment decision-making and will provide forecasting tools to predict the future movement of risk premiums.

In this study we also looked to test the theory of Market Efficiency in the bonds market. The last decade we had important changes in the international financial market. We had improved communication, information and in general a substantial increase in cross-border investment and international bonds market activities. This transformation has been further accelerated by the generalized trend towards liberalization and deregulation of capital and money markets.

[2] Eastern Europe, East Asia, Africa and Latin America

[3] The concept of cointegration was developed by Engle and Granger (1987) and the testing procedure was developed by Johansen (1988, 1991, and 1995).

[4] Johansen's cointegration model framework has the advantage of taking into account short-term dynamics of variables while allowing for the return of the system to a long-term equilibrium.

The growing internationalization of capital markets has increased the interest in the efficiency of financial markets internationally. We can apply the cointegration and error correction method to test the theory of Market Efficiency in the bonds market in these four differ regions. The absent of cointegration (absence of a long-run equilibrium) suggests that the government bonds market is consistent with the Efficient Market Hypothesis.[5]

Are the markets predictable? This is related to the Efficient Market Hypothesis: it is not possible to forecast the return[6] on an asset and all relevant market information has already been incorporated in to its price. With the same logic for this thesis it should not be possible to forecast the risk premium in an Efficient Market.
The more efficient the market, the more random is the sequence of price changes (or the risk premium changes) generated by the market, and the most efficient market is one where price changes (or the risk premium changes) are completely random and unpredictable.

Using the cointegration test, Lajaunie and Naka (1992) employ time series data to test the efficiency of the Tokyo foreign exchange, based on the procedures developed by Phillips and Ouliaris (1990), Johansen and Juselius (1990) and Johansen (1991). Karfakis and Parikh (1994) investigate the Market Efficiency Hypothesis for 5 major exchange rates of the Australian dollar, applying the cointegration methodology. Here in this thesis I am using the cointegration test to test the Market Efficiency Hypothesis for the government bonds market of the regions specified above. Absence of cointegration (absence of a long-run equilibrium) suggests that the government bonds market is consistent with the Efficient Market Hypothesis.

---

[5] If markets are efficient, the realized returns should be serially uncorrelated (in this thesis the realized risk premiums should be serially uncorrelated).

[6] Asset return = risk premium +risk free return

In principle, the cointegration perspective is able to detect market inefficiencies and reduces market noise caused by unpredictable events or news information, which would influence the price of a whole group of assets. See Shadbolt and Taylor (2002).

The rest of this thesis proceeds in the following fashion. Section 2 presents the data used, Section 3 describes the methodology employed, and Section 4 discusses the empirical findings, employing a Vector Error Correction Model, Granger causality tests and impulse response functions to further explore the long and short-run dynamics of the Bonds market risk premium series. Finally, Section 5 presents the conclusions and suggests possible extensions.

Chapter 2

2. Data

The study is conducted for seventeen countries that represent major government bonds markets across four regions, Eastern Europe, Africa, Latin America and the Asia region. The countries are: Russia, Poland, Hungary, Bulgaria, Argentina, Mexico, Uruguay, Panama, Venezuela, Brazil, Israel, South Africa, Egypt, China, The Philippines, Thailand and Korea.

Our empirical analysis employed daily data on risk premiums for different long-run government bonds for these seventeen countries, with this study focusing on each region separately.

The data was obtained from the database of Credit Suisse First Boston Bank and includes historical data. The period covered is from May 21, 1999 to May 23, 2002. (The individual data series were transformed to logarithmic form, in order to achieve stationarity in their variances)[7]

Figure 1 plots the individual risk premiums data series for the four different regions and Figure 2 plots the individual risk premiums data series in logarithmic form. When looking at the graphs most of the series appear to have a downward trend, with the exception of Argentina and Uruguay that have an upward tread. The risk premiums have also turned upward toward the end of the sample period for China.

The series by region are:

[7] Examination of the individual data series makes it clear that logarithmic transformations were required to achieve stationarity in variance

Latin America	
Arge_FRB	Argentina's Federal Reserve Bank bonds
Arge_09	Argentina's Government Bonds maturing in 2009
Mex_05	Mexico's Government Bonds maturing in 2005
Mex_07	Mexico's Government Bonds maturing in 2007
URUG_03	Uruguay's Government Bonds maturing in 2003
URUG_08	Uruguay's Government Bonds maturing in 2008
PAN_08	Panama's Government Bonds maturing in 2008
PAN29P06	Panama's Government Bonds maturing in 2006
Vene_07	Venezuela's Government Bonds maturing in 2007
Vene_18	Venezuela's Government Bonds maturing in 2018
Brazil_04	Brazil's Government Bonds maturing in 2004
Brazil_09	Brazil's Government Bonds maturing in 2009

Asia	
China_04	China's Government Bonds maturing in 2004
Phil_10	Philippine's Government Bonds maturing in 2010
Phil_PDI	
Thai_07	Thailand's Government Bonds maturing in 2007
Kor_08	Korea's Government Bonds maturing in 2008
KDB_72506	Korea's Development Bonds maturing in 2006

Eastern Europe	
Rus_03	Russia's Government Bonds maturing in 2003
Rus_07	Russia's Government Bonds maturing in 2007
Rus_10	Russia's Government Bonds maturing in 2010
Pol_04	Polish Government Bonds maturing in 2004
Pol_17	Polish Government Bonds maturing in 2017
Pol_PBS_09	Polish Bonds maturing in 2009
Hung_06	Hungary's Government Bonds maturing in 2006
Bulgaria_IAB11	Bulgaria's Government Bonds maturing in 2011
Bulgaria_FLI12	Bulgaria's Government Bonds maturing in 2012

Africa	
Israel_10	Israel's Government Bonds maturing in 2010
IsraelE_06	Israel's Government Bonds maturing in 2006
SOAF_06	South Africa's Government Bonds maturing in 2006
SOAF_09	South Africa's Government Bonds maturing in 2009
SOAF_17	South Africa's Government Bonds maturing in 2017
Egypt_06	Egypt's Government Bonds maturing in 2006
Egypt_11	Egypt's Government Bonds maturing in 2011

Chapter 3

3. Methodology

3.1 Vector autoregression

The vector autoregression (VAR) is commonly used for forecasting systems of interrelated time series data and for analyzing the dynamic impact of random disturbances on the system of variables. At the same time, the VAR is not just useful for forecasting, but is also useful for describing various characteristics of the data and for testing certain types of theories.

The VAR approach sidesteps the need for structural modeling through the use of modeling the endogenous variables within the system as a function of their lagged values.

I. VAR Theory

Vector autoregression (VAR) modeling is used for multiple time series analysis. It is one approach in econometrics that can be applied to describe a system of more than one equation, and was originally introduced by Sims (1980a)[8]. The classical multi equation modeling (e.g. Dhrymes, 1978) is not considered here. For a detailed description of multiple time series analysis you can refer to Lütkepohl (1993), and for a clear discussion of VAR you can refer to Pagan (1987), who views VAR as a major methodological approach to econometrics.

The mathematical form of a VAR is:

$$y_t = A_1 y_{t-1} + ... + A_p y_{t-p} + Bx_t + \varepsilon_t$$

---

[8] The seminal work of Sims (1972; 1980a; 1980b; 1982) introduced the vector autoregressive (VAR) methodology into the mainstream of applied macroeconomic research as an alternative to large scale macroeconometric models.

where y_t is a k vector of endogenous variables, x_t is a vector of exogenous variables, $A_1, A_2, \ldots, A_p$ and B are matrices of coefficients to be estimated, and ε_t is a vector of innovations that may be contemporaneously correlated with each other, but are uncorrelated with their own lagged values and uncorrelated with all of the equation's right-hand side variables.

Even though econometric analysis will never reveal the actual values of A_i, an appropriately specified model will have forecasts that are unbiased and with a minimum variance.

Here we assume that both x_t and y_t are stationary. Sims (1980) and Sims, Stock, and Watson (1990) recommend against differencing even if the variables contain a unit root.

II. <u>Specifying a VAR Model and the process order:</u>

The starting point is the formulation of the unrestricted VAR model.

We can use economic theory or information contained in the data for specifying the model order p. Since theory provides us with no prior knowledge, we use statistical tools for choosing an appropriate p such as the information criteria. I can use the Akaike Information Criterion (AIC), Schwarz Information Criterion (SIC), and the Hannan – Quinn Information Criterion (HQ) (see Severini and Staniswalis, 1994, Chapter 4).

With the information criteria, we can compare different VAR(p) models containing different $p = 0,1,\ldots,n$ with respect to some objective function. The order p, which optimizes the function, is the recommended order to be used for estimation. Before we apply the order selection criteria we must set the highest possible order $p_{\max}$. This can be difficult: In order to avoid an optimum at the edge and to restrict the parameter space not too much $p_{\max}$ should be reasonable large. On the other hand $p_{\max}$ must not be too large, since we need at least $p_{\max} + 1$ presample values which reduces the sample size T. For a detailed discussion about the properties of the criteria see Lütkepohl (1993).

Here we assume that all the series are stationary but we don't know if this is actually true. All variables to be included in the VAR are required to be stationary in order to carry out the joint significance tests on the lags of the variables. Hence, we subject all variables to the unit root test (Augmented Dickey - Fuller test (ADF -test)).

3.2 Unit Root Test

I. Stationarity

To use a series the series must be stationary. A series is said to be (weakly or covariance) stationary if the mean and autocovariances of the series do not depend on time. Any series that is not stationary is said to be nonstationary[9]. It is important to check whether a series is stationary or not before using it in a regression. The formal method to test the stationarity of a series is the unit root test.

II. Unit Root Tests

The two widely used unit root tests are the: Augmented Dickey-Fuller (ADF) tests, and the Phillips-Perron (PP) test. In recent years we now also have the newest generation of unit root tests. In addition to the existing Augmented Dickey-Fuller (1979) and Phillips-Perron (1988) tests, we can use the GLS-detrended Dickey-Fuller (Elliot, Rothenberg, and Stock, 1996), Kwiatkowski, Phillips, Schmidt, and Shin (KPSS, 1992), and Ng and Perron (NP, 2001) unit root tests.

[9] The assumptions of the classical regression model necessitate that both the independent and dependent sequences be stationary and the errors have a zero mean and a finite variance. In the presence of nonstationary variables, there might be what we call a spurious regression. A spurious regression has a high R^2 and t – statistics that appear to be significant, but the results are without any economic meaning (any t – test, F – test, or R^2 values are unreliable).

III. Unit Root Theory

For more detail about unit root theory see, Davidson and MacKinnon (1993, 2004), Chapter 20 and Chapter 16 respectively, Hamilton (1994), Chapter 17, Hayashi (2000), Chapter 9, Maddala and Kim (1998) and Dhrymes (1998).

Consider a simple AR(1) process:

$$y_t = \mu + \rho y_{t-1} + \varepsilon_t$$

where μ and ρ are parameters and ε_t is assumed to be white noise. y_t is a stationary series if $-1 < \rho < 1$. If $\rho = 1$, y is a nonstationary series. Therefore, the hypothesis for testing if a series is stationary can be evaluated by testing whether the absolute value of ρ is strictly less than one. Both the DF and the PP tests take the unit root as the null hypothesis, $H_0 : \rho = 1$, this null hypothesis is tested against the one-sided alternative

$H_1 : \rho < 1$.

The test is carried out by estimating an equation where y_{t-1} is subtracted from both sides:

$$\Delta y_t = \mu + \gamma y_{t-1} + \varepsilon_t$$

where $\gamma = \rho - 1$ and the null and alternative hypotheses are

$$H_0 : \gamma = 0 ,$$

$$H_1 : \gamma < 0$$

While it may appear that the test can be carried out by performing a t-test on the estimated γ, the t-statistic under the null hypothesis of a unit root does not have the conventional t-distribution. Dickey and Fuller (1979) showed that the distribution under the null hypothesis is nonstandard, and simulated the critical values for selected sample sizes. More recently, MacKinnon (1991) has implemented a much larger set of simulations than those tabulated by Dickey and Fuller. In addition, MacKinnon estimates the response surface using the simulation results, permitting the calculation of Dickey-Fuller critical values for any sample size.

The simple unit root test described above is valid only if the series is an AR(1) process. If the series is correlated at higher order lags we use the Augmented Dickey-Fuller (ADF) test.

a) <u>The Augmented Dickey-Fuller (ADF) Test</u>

The ADF approach controls for higher-order correlation by adding lagged difference terms of the dependent variable y to the right-hand side of the regression:

$$\Delta y_t = \mu + \gamma y_{t-1} + \delta_1 \Delta y_{t-1} + \delta_2 \Delta y_{t-2} + \ldots.. + \delta_{p-1} \Delta y_{t-p+1} + \varepsilon_t$$

This augmented specification is then used to test:

$$H_0 : \gamma = 0,$$

$$H_1 : \gamma < 0$$

We will face two practical issues in performing the ADF test. First, we will have to specify the number of lagged first difference terms to add to the test regression. The usual (though not particularly useful) advice is to include lags sufficient to remove any serial correlation in the residuals. Second, you have the choice of including a constant, a constant and a linear time trend, or neither in the test regression. One approach would be to run the test with both a constant and a linear trend since the other two cases are just special cases of this more general specification. However, including irrelevant regressors in the regression reduces the power of the test, possibly concluding that there is a unit root when, in fact, there is none. The general principle is to choose a specification that is a plausible description of the data under both the null and alternative hypotheses (Hamilton 1994, p.501). If the series seems to contain a trend (whether deterministic or stochastic) you should include both a constant and trend in the test regression. If the series does not exhibit any trend and has a nonzero mean, you should only include a constant in the regression. While if the series seems to be fluctuating around a zero mean, you should include neither a constant nor a trend in the test regression.

Criticism

A number of authors have pointed out that the standard ADF tests are not appropriate for variables that may have undergone structural changes. For example, Perron (1989, 1990) has shown that the existence of structural changes tends to bias the standard ADF tests towards nonrejection of the null hypothesis of a unit root. Hence, it might be misleading to conclude that the variables are nonstationary just on the basis of the results from the standard ADF tests. Perron (1990) developed a procedure to test the hypothesis that a given series Y_t has a unit root with an exogenous structural break which occurs at time T_b.

b) The Phillips-Perron (PP) Test

With the DF test we use the assumption that the error terms are independently and identically distributed. The ADF test adjusts the DF test to take care of serial correlation in the error terms by adding the lagged difference terms into the regression. Phillips and Perron (1988) propose an alternative (nonparametric) method of controlling for higher order serial correlation in the series when testing for a unit root, without adding lagged difference terms. The PP method estimates the equation,

$$\Delta y_t = \mu + \gamma y_{t-1} + \varepsilon_t$$

and modifies the t-ratio of the γ coefficient so that serial correlation does not affect the asymptotic distribution of the test statistic. The asymptotic distribution of the PP modified t -ratio is the same as that of the ADF statistic.

c) Dickey-Fuller Test with GLS Detrending (DFGLS)

In the ADF test regression, you may include a constant, or a constant and a linear time trend. Elliot, Rothenberg, and Stock, (1996) proposed a simple modification of the ADF tests in which the data is detrended so that the explanatory variables are "taken out" of the data prior to running the test regression.

3.3 Cointegration Test

If I have a time series that contains a unit root (non-stationary time series), Engle and Granger (1987)[10] pointed out that a linear combination of two or more nonstationary series may be stationary. If such a stationary linear combination exists, the nonstationary time series are said to be cointegrated. The stationary linear combination is called the cointegrating equation and may be interpreted as a long-run equilibrium relationship of the variables. This means that even though each series diverges from its mean as time passes, the series move together in the long run.

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[10] The classic papers on cointegration are those of Hendry (1986), Granger (1986), and Engle and Granger (1987).

Therefore, cointegration among economic time series is often interpreted as indicating some sort of long-run equilibrium relationship.[11]

There are two major important ways to test for cointegration, the Engle and Granger (1987) test and the Johansen (1991) test. The first one is a straightforward test for cointegrating relationships between two variables. The Johansen (1991) test has the advantage of being invariant to normalization and can reveal cointegrating relationships among more than two variables. However, because of data limitations in my study, the Johansen test is infeasible for the entire sample of countries for all regions because of this I have chosen to test each region separately.

I. Engle –Granger Test

To implement the Engle- Granger test, we first regress the series X_t on that of series Y_t:[12]

$$Y_t = b_0 + b_1 X_t + u_t$$

These two series can be regarded as cointegrated if the residuals from regression are stationary. Thus, the null hypothesis of no cointegration is tested by determining whether the $\hat{u}_t$ have a unit root, which involves estimating the test regression,

$$\Delta \hat{u}_t = (a-1)\hat{u}_{t-1} + \varepsilon_t$$

and applying a residual-based unit -root test.

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[11] For more detail about cointegration theory see, Hamilton (1994), Enders (2003), Hendry (1996), Granger(1990), Hatanaka (1996), Banerjee et al. (1993), Hargreaves (1994) and Harris (1995, 2003).

[12] Including a time trend had no impact on the results.

II. Johansen's Cointegration Test

In contrast, Johansen's test takes a full-information maximum likelihood (FIML) approach to the problem. It employs a power function with better properties than the Engle-Granger method (Kremers 1992), and has less bias when the number of variables is greater than two (Johansen, 1988, 1991; Johansen and Juselius, 1990)[13]. Following Johansen, we specify a VAR in the series, which we express in levels as a VAR of order p:

$$y_t = A_1 y_{t-1} + A_2 y_{t-2} + \ldots . + A_p y_{t-p} + B_1 x_t + \varepsilon_t \qquad (1)$$

where y_t is a k-vector of non-stationary I(1) variables, x_t is a vector of deterministic variables, and ε_t is a vector of random disturbances, assumed to be identically and independently normally distributed.

We can rewrite the equation (1) as follows:

$$\Delta y_t = \Pi y_{t-1} + \sum_{i=1}^{p-1} \Gamma_i \Delta y_{t-i} + \mathrm{B} x_t + \varepsilon_t \qquad (2)$$

where

$$\Pi = \sum_{i=1}^{p} \mathrm{A}_i - I \quad \text{and} \quad \Gamma_i = -\sum_{j=i+1}^{p} \mathrm{A}_j$$

The purpose of the cointegration model is to establish the number of long-run stationary relationships among the variables contained in y_t. In other words, we may

[13] Those methods are introduced by Johansen (1988, 1991) and initially applied by Johansen and Juselius (1990, 1992). A similar approach was introduced independently by Ahn and Reinsel (1988, 1990). Johansen (1995) provides a detailed exposition.

determine the number of cointegrated vectors by studying the rank of the matrix Π, as follows.

Granger's representation theorem asserts that if the coefficient matrix Π has reduced rank $r < k$, then there exist $k \times r$ matrices a and β each with rank r such that $\Pi = \alpha\beta'$ and $\beta' y_t$ is stationary I(0). r is the number of cointegrating relations (the cointegrating rank) and each column of β is the cointegrating vector. The elements of a are known as the adjustment parameters[14] in the Vector Error Correction Model (VEC). Johansen's method estimates the Π matrix from an unrestricted VAR and tests whether we can reject the restrictions implied by the reduced rank of Π. If $r = 0$, then Π = 0, and there exists no linear combination of the elements of y_t that is stationary. At the other extreme, if rank(Π) = k, y_t is a stationary process. In the intermediate case, when $0 < r < k$, there exist r stationary linear combinations of the elements of y_t along with $k - r$ stochastic trends.

We test for the reduced rank of Π by using a likelihood ratio test. The procedure uses the technique of reduced rank regression first introduced by Anderson (1951) and applied to systems of $I(1)$ variables independently by Johansen (1988) and Ahn and Reinsel (1990). This technique is appealing because it delivers at once the MLE of α and β and the eigenvalues needed to construct likelihood ratio tests. Consider the problem of testing the null hypothesis that there are at most r cointegrating vectors against the unrestricted model (2). The null hypothesis is that rank(Π) = r and the alternative is that rank(Π) =k. The likelihood ratio test statistic, called the Trace statistic by Johansen and Juselius (1990), is given by

$$Trace = -T \sum_{i=r+1}^{k} \log(1 - \lambda_i) \qquad (3)$$

where the λ_i are the eigenvalues, ordered from smallest to largest, which arise in the

[14] Since the speed-of-adjustment parameters are small in value the values adjust relatively slowly to changes in the equilibrium relationship.

solution of the reduced rank regression problem. In order to test the null hypothesis we have to calculate the trace statistic (3) and compare it with the 5% or 1% critical values from Osterwald-Lenum (1992).

It is also possible to test the null hypothesis that rank(Π) = r against the alternative that rank(Π) = r + 1. In that case[15], the likelihood ratio statistic, which is called the $\lambda_{\max}$ statistic, is

$$\lambda_{\max} = -T \log(1 - \lambda_{r+1}) \qquad (4)$$

Of course, the $\lambda_{\max}$ statistic is equal to the Trace statistic when $k - r = 1$.

There are two major ways to test for cointegration, the Engle and Granger test and the Johansen test. There are also many other cointegration tests, Phillips and Ouliaris (1990) propose a two step cointegration test based on the residuals from a cointegration regression, and a test described by Engle and Yoo (1987) is based on the significance of the disequilibrium terms in the Vector Error Correction (VEC)[16].

After running the Johansen cointegration test to determine the number of cointegrating relations, we estimate the Vector Error Correction (VEC) Model.

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[15] It is called the maximum eigenvalue test since it compares the r cointegrating relations null with an r + 1 alternative.

[16] Here the disequilibrium terms is the speed – of – adjustment coefficients that will I see later.

3.4 Vector Error Correction Model[17]

The Vector Error Correction Model (VECM) was first introduced by Sargan (1984) and later popularized by Engel and Granger (1987). Engle and Granger have shown that a system of cointegrated variables can be represented by a dynamic Error-Correction Model (ECM) by invoking the Granger's Representation Theorem.

The Granger Representation Theorem states that a VAR model on differences of I(1) variables will be misspecified if the variables are cointegrated (Engle and Granger, 1987). Engle and Granger showed that an equilibrium specification is missing from a VAR representation (1), but when lagged disequilibrium terms are included as explanatory variables the model become well specified. Such a model is called an error correction model because it has a self regulating mechanism whereby deviations from the long run equilibrium are automatically corrected.

A VEC Model is a restricted VAR designed to be used with nonstationary series that are known to be cointegrated. The VEC has cointegration relations built into the specification so that it restricts the long-run behavior of the endogenous variables to converge to their cointegrating relations, while also allowing for short-run adjustment dynamics. (The cointegration term is known as the error correction term, since the deviation from the long-run equilibrium is corrected gradually through a series of partial short-run adjustments.)

Because the VEC specification only applies to cointegrated series, I first run the Johansen cointegration test to determine the number of cointegrating relations.

For a deeper discussion of VAR and VEC models, see Davidson and MacKinnon (1993, pp.715–730), and Hamilton (1994, Chapter 19, pp. 571–629).

[17] The link between cointegration and error correction mechanisms is discussed in Mills (1990, pp. 273-274), Cuthbertson, Hall and Taylor (1992, pp. 133-134), and Alogoskoufis and Smith (1995).

Consider the P- dimensional vector autoregressive model with Gaussian errors, that we saw before:

$$y_t = A_1 y_{t-1} + A_2 y_{t-2} + ... + A_p y_{t-p} + B_1 x_t + \varepsilon_t \qquad (1)$$

Following Johansen (1991, 1995), model (1) can be reformulated into a Vector-error—correction form:

$$\Delta y_t = \Pi y_{t-1} + \sum_{i=1}^{p-1} \Gamma_i \Delta y_{t-i} + \mathrm{B} x_t + \varepsilon_t \qquad (2)$$

where

$$\Pi = \sum_{i=1}^{p} \mathrm{A}_i - I \quad \text{and} \quad \Gamma_i = -\sum_{j=i+1}^{p} \mathrm{A}_j$$

The principal difference between model (1) and model (2) is that the time paths of cointegration are influenced by the extent of any deviation from the long-run equilibrium, as well as by their separate self-feedback pattern plus stochastic shocks and the exogenous variable.

Equation (2) resembles a VAR model in first differences, except for the inclusion of the lagged level of y_{t-1}, an error correction term, which will contain information about the long run relationship among variables in the vector y_t. This way of specifying the system contains information on both the short and long-run adjustment to changes in y_t through the estimates of Γ and Π respectively. The VECM equation (eq. 2) above allows for three model specifications. (a) If Π is of full rank, then y_t is stationary in levels and a VAR in levels is an appropriate model. (b) If Π has a zero rank, then it contains no long run information, and the appropriate model is a VAR in first differences (implies variables are not cointegrated). (c) If the rank of Π is a positive number, r, and is less than k (where k is the number of variables in the system), there exists matrices α and β, with dimensions (k x r), such that $\Pi = \alpha\beta$ '. In this representation β contains the coefficients of the r distinct long run cointegrating vectors that render $\beta' y_t$ stationary, even though y_t is itself non-stationary, and α contains the short-run speed of adjustment coefficients[18] for the equations in the system.[19]

Johansen's methodology requires the estimation of the VAR equation (2) and the residuals can then be used to compute two likelihood ratio (LR) test statistics that can be used in the determination of the cointegrating vectors of y_t. The first test which considers the hypothesis that the rank of Π is less than or equal to r cointegrating vectors is given by the trace test below:

$$Trace = -T \sum_{i=r+1}^{k} \ln(1-\lambda_i)$$

The second test statistic is known as the Maximal Eigenvalue Test which computes the null hypothesis that there are exactly r cointegrating vectors in y_t and is given by:

$$\lambda_{\max} = -T \ln(1-\lambda_r)$$

The distributions for these tests are not given by the usual chi-squared distribution. The asymptotic critical values for these likelihood ratio tests are calculated via numerical simulations (see Johansen and Juselius 1990; and Osterwald-Lenum 1992).

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[18] When these coefficients are large, adjustment is quick so the linear combination of the I(1) series will be highly stationary and reverting back to the long-run equilibrium will be rapid.

[19] More details of short-run dynamics in cointegrated systems may be found in Proietti (1997).

Two major approaches are used in the selection of lags: the Akaike information criteria (AIC) and the Schwarz criteria (SC). Formally, these test statistics use the following log-likelihood function assuming a multivariate normal distribution:

$$L = -\frac{Tk}{2}(1 - \log 2\pi) - \frac{T}{2}\log\left[\det\left(\frac{\sum \varepsilon_t \varepsilon_t^{'}}{T}\right)\right]$$

The two information criteria are computed as,

$$AIC = -\frac{2L}{T} + \frac{2n}{T} \quad \text{and} \quad SC = -\frac{2L}{T} + n\frac{\log T}{T}$$

where $n = k(d + pk)$ is the number of estimated parameters in the VAR. The lowest AIC or SC values gives the most desirable model. Once the rank of matrix Π is determined, we can estimate the VEC model (2) and conduct innovation accounting and causality tests. Here at this study we set up a VECM by using the Schwarz criterion to select the appropriate lag lengths (see Reimers (1993)).

3.5 Granger Causality

One of the questions that can be addressed with VAR is how useful some variable are for forecasting others. Causality is very important because it is synonymous with predictability. The question of whether X causes a change in Y is investigated empirically using different methods. One approach is to use the Granger causality test, proposed by Granger (1963, 1969). Causality proposed by Granger which builds on earlier research by Weiner (1956). Other, closely related, definitions of causality have been suggested, notably by Sims (1972).

I. Granger Causality Tests

The Granger (1969, 1988) approaches the question of whether x causes y is to see how much of the current y can be explained by past values of y and then to see whether adding lagged values of x can improve the explanation. y is said to be "Granger-Caused" by x if x helps in the prediction of y, or equivalently if the coefficients on the lagged x 's are statistically significant. Note that two-way causation is frequently the case; x Granger causes y and y Granger causes x.

(It is important to note that the statement "x Granger causes y" does not imply that y is the effect or the result of x. Granger causality measures precedence and informational content but does not by itself indicate causality in the more common use of the term.)

The idea behind the Granger causality test is the following: If x causes y, the change in x should come before the change in y. This is equivalent to saying that the lagged values of x should help predict the current values of y. The past values of y should not have any significant power in explaining the current variations in x.

To Do this we can run bivariate regressions of the form:

$$X_t = a_0 + \sum_{i=1}^{k} a_{x,i} X_{t-i} + \sum_{i=1}^{k} a_{y,i} Y_{t-i} + \varepsilon_{x,t} \qquad (5)$$

$$Y_t = \beta_0 + \sum_{i=1}^{k} \beta_{x,i} X_{t-i} + \sum_{i=1}^{k} \beta_{y,i} Y_{t-i} + \varepsilon_{y,t} \qquad (6)$$

Where $\varepsilon_{x,t}$ and $\varepsilon_{y,t}$ are independent white noise processes.

If regression equations (5) and (6) fail to reject the null hypothesis

$$H_0 : a_{y,1} = a_{y,2} = \dots\dots\dots = a_{y,k} = 0$$

that implies that y does not Granger cause x. Similarly, failing to reject the null hypothesis

$$H_0 : \beta_{x,1} = \beta_{x,2} = \dots\dots\dots = \beta_{x,k} = 0$$

indicates that x does not Granger cause the y. In order to conclude that x does Granger cause y, two conditions should be met. First, the null hypothesis of "x does not Granger cause y" should be rejected, Second, the null hypothesis of "y does not granger cause x " should not be rejected. If the two null hypotheses are rejected simultaneously, there is said to be a feedback relation between x and y.

In regression equations (5) and (6), in general it is better to use more rather than fewer lags, since the theory is couched in terms of the relevance of all past information. We should pick a lag length that corresponds to reasonable beliefs about the longest time over which one of the variables could help predict the other.

To test the null hypothesis

$$H_0 : a_{y,1} = a_{y,2} = \dots\dots\dots = a_{y,k} = 0$$

and

$$H_0 : \beta_{x,1} = \beta_{x,2} = \dots\dots\dots = \beta_{x,k} = 0$$

we use the reported F-statistics[20] for the joint hypothesis testing of each equation. The null hypothesis is therefore that y does not Granger-cause x in the first regression and that x does not Granger-cause y in the second regression.

In chapter 4 we will see that my time series contains a unit root. The implementation of the Granger causality if I have a unit root requires certain transformations of the original variables. If two variables are cointegrated, Engle and Granger (1987) showed that the error correction term is required in testing for Granger causality

II. Granger Causality Test under the VEC Framework

If there is evidence of a cointegrating relationship among the various bond markets, we can be assured that causality exists between the markets in at least one direction. One can therefore make causality inferences by simultaneously estimating the parameters of the following VECM equation:

$$\Delta Y_t = \alpha + \mathrm{B}(L)\Delta Y_{t-1} + \delta Z_{t-1} + \varepsilon_t \qquad (7)$$

where,

$Y_t = nxt$ vector of variable,

$\alpha = nx1$ vector of constants,

$B(L) = nxn$ matrices of the polynomial expression in the lag operator (L):

$$B(L) = \sum_{s=1}^{m} B_{ij}(s) L^{s-1}$$

for i,j =n, and m =number of lags

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[20] The F-statistic is calculated from residual sums of squares in the restricted and unrestricted models. The F test given by $F = (N-k)\dfrac{(ESS_R - ESS_{UR})}{q(ESS_{UR})}$ follows the F distribution with q and (N-k) d.f: N is the number of observations; k is the number of estimated parameters in the unrestricted regression; and q is the number of parameter restrictions. If the computed F value exceeds the critical F value at the chosen level of significance, we reject the null hypothesis.

$\delta = nx1$ vector of constants

$Z_{t-1} = nxt$ vectors of error correction terms from equation (4)

$\varepsilon_t = nxt$ vector of residuals

The model allows us to differentiate between the short-run and long-run dynamic relationships, and tests for the hypothesis that the coefficients of lagged variables and the error correction terms calculated from the cointegrating regression are zero. If the coefficients in the system are jointly significant, it means that the lagged variables in the system are important in predicting current movements of the dependent variables (i.e., the short run dynamics), and the dependent variables in the equation adjust to the previous period's equilibrium error. Standard Granger causality tests overlook the latter channel of influence. On the other hand, note that if there is no evidence of a cointegrating relationship, then the inclusion of an error-correction term will not improve the dynamic representation, and the system can be reduced to that of a Granger framework (see Granger (1969)).

The estimation of the VEC model allows testing for Granger causality. After we found that there is a cointegrating relationship and we have estimated the Vector Error Correction Model (VECM), the next step is to test for causality. When there are cointegration relationships, we can test for short-run causality using an $F-test$ of the significance of the lagged differences of the relevant variables. In addition, we can test for long-run causality by, using a $t-test$ of the significance of the error correction term [21]. Some empirical references are Khalid and Guan (1999), Wernerheim (2000) and Hayo (1999). Particularly, each equation can be tested to determine whether any of the two right-hand-side variables cause the left-hand-side variable. The null hypothesis of noncausality can be rejected not only if one finds significant the lagged logarithmic differences ($F-test$) of a particular variable in

[21] We test the coefficients of the error correction term which are often referred to as speed –of – adjustment parameter. They reflect the response with which the system of the cointegrated variables move back to their long-run equilibrium relation. The larger the coefficients of the error correction term, the greater the response of the cointegrated variables to move back to their long-run equilibrium relation. Thus, the coefficients capture the effect of the deviation of the variables from their long-run equilibrium.

any of the equations, but also if one finds significant the coefficient of the lagged error correction term ($t - test$).[22, 23]

According to Granger (1988), causality within the framework of the VEC model can occur in two different ways. The first way is through the impact of the lagged differences of a right-hand-side variable. The second way is through the error correction term, which is a function of the one-period lagged values of the variable. Granger suggests that the impact of the lagged difference of a right-hand-side variable on the left-hand-side variable captures the short-run dynamics of the system and therefore can be interpreted as short-run causality. The impact of the one –period lagged error correction term on the left-hand-side variable captures the extent that the variables are out of equilibrium: thus, it can be interpreted as long-run causality. Toda and Philips (1994), who discuss the asymptotic case of a causality test with a VEC model, distinguish the two parts of the hypothesis as

"short-run noncausality" and "long-run noncausality."

For example if we have the VEC Model (7), the null hypothesis of short-run noncausality is stated by setting coefficient $B_{ij} = 0$. The null hypothesis for long-run noncausality is stated by setting coefficients, $\delta_i = 0$.[24]

A test for overall Granger causality that combines the two sources of causality was also constructed.[25] If the coefficients of the error correction terms and the coefficients

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[22] According to Sims, Stock and Watson (1990), the t-ratio of the coefficient of the error correction term follows an asymptotic standard normal distribution.

[23] The error correction term is a stationary variable with a zero mean.

[24] At least one of the B(i,j) coefficients must be significantly different than zero to support short-run causality.

[25] Since this test considers both sources of causality, it is only reported by some authors as testing for Granger causality, especially when these authors are not interested in the long- and short-run impacts of the variables.

of the lagged differences of a right-hand-side variable are jointly significant, Granger causality is established. The appropriate test is an $F(wald)-test$.

3.6 Impulse Response Analysis (Impulse Response Functions)

Dynamic simulations are used to calculate the variance decompositions (VDC) and the impulse response functions (IRF), while a time period horizon is employed to allow the dynamics of the systems to play out. In chapter 4 we will see the results for a twenty-day time period to convey a sense of the dynamics of the system.

Impulse response analysis is based on the VMA (Vector-moving-average) presentation of the VAR model (1)

$$y_t = A_1 y_{t-1} + A_2 y_{t-2} + \dots + A_p y_{t-p} + B_1 x_t + \varepsilon_t \qquad (1)$$

A VAR was written in vector $MA(\infty)$[26] form as

$$y_t = \mu + \varepsilon_t + \psi_1 \varepsilon_{t-1} + \psi_2 \varepsilon_{t-2} + \dots + \psi_n \varepsilon_{t-n} + \dots$$

As shown by Lütkepohl and Reimers (1992), innovation accounting can also be used in a vector – error – correction model (2)

$$\Delta y_t = \Pi y_{t-1} + \sum_{i=1}^{p-1} \Gamma_i \Delta y_{t-i} + \mathrm{B} x_t + \varepsilon_t \qquad (2)$$

to obtain information concerning the interactions among the variables. In general, an impulse response function, $\psi_{j,k}(i)$, identifies the consequences of a one unit

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[26] MA = Moving-Average

increase in the k^{th} variable's innovation at period t ($\varepsilon_{k,t}$) for the value of the j^{th} variable at period $t+i(y_{j,t+i})$. It is formally defined as

$$\frac{\partial y_{j,t+1}}{\partial \varepsilon_{k,t}} = \psi_{j,k}(i)$$

Another use of $\psi_{j,k}(i)$ is for generating the forecast error variance decomposition, which measures the proportion of the movements in a sequence caused by its "own" shocks versus shocks to other variables. For example, in a two-variable VAR system (y and x), the variance of the m – step ahead forecast error variance of y_{t+m} is expressed as

$$\sigma_y(m)^2 = \sigma_y^2 \sum_{j=0}^{m-1} \psi_{11}(j)^2 + \sigma_x^2 \sum_{j=0}^{m-1} \psi_{12}(j)^2$$

where σ_y^2 and σ_x^2 are the variances of Gausian errors $\{\varepsilon_{yt}\}$ and $\{\varepsilon_{xt}\}$, respectively. Therefore, the proportions of $\sigma_y(m)^2$ due to shocks in the $\{\varepsilon_{yt}\}$ and $\{\varepsilon_{xt}\}$ sequences are

$$\frac{\sigma_y^2 \sum_{j=0}^{m-1} \psi_{11}(j)^2}{\sigma_y(m)^2} \quad \text{and} \quad \frac{\sigma_x^2 \sum_{j=0}^{m-1} \psi_{12}(j)^2}{\sigma_y(m)^2}$$

For a detailed discussion about Impulse Response Analysis and Variance Decomposition See Hamilton (1994) and Lutkepohl and Reimers (1992).

Chapter 4

4 Empirical Results

Our empirical analysis employed daily data on risk-premiums for long run government bonds across four regions and seventeen countries of East Europe, East Asia, Africa and Latin America.

The empirical application that follows consists of three steps. In the first step, we test for the order of integration of each time series, using the univariate Augmented Dickey Fuller (ADF) unit root test. In the second step, we test for the existence of cointegration relations using the Johansen procedure (Johansen (1988)). In the third and last step we estimate the Vector Error Correction Model (VECM), test for causality, and present the impulse response functions.

4.1 Unit Root Results

To analyze a series the series must be stationary. Therefore, it is important to check whether a series is stationary or not before using it in a VAR. As mentioned before the formal method to test the stationarity of a series is the unit root test.

When completing the unit root test we can never be fully sure that we are including the appropriate deterministic regressors in our econometric model, though there are some useful guidelines that I followed.

First: I plotted the data. Visual inspection can help determine whether there is a clear tread in the data. In Figure 2 we visualize the series.

Second: I plotted the correlations (correlograms)[27] for each series,

[27] ρ is the correlation, γ is the covariance

$$\hat{\rho}(p) = \frac{\hat{\gamma}(p)}{\hat{\gamma}(0)}$$

The correlations against the lag p, as well as the plot of partial correlations against p, are standard methods used in time series analysis. The correlogram is a useful diagnostic plot for short memory processes. Partial correlations may be used to identify the order p of an autoregressive process. This is discussed in detail for example in Box and Jenkins (1970). In finite samples, the correlogram of a unit root process will decay slowly. As such, a slowly decaying ACF can be indicative of a unit root or a near unit root process.
In Figure 3 we visualize the ACF and the PACF[28] for the series and we see that all the series are near unit root or are unit root.

After these investigations I moved to perform an ADF test but the problem in the ADF test is the number of the lags that I will use. Too few lags means that the regression residuals do not behave like white noise processes, the model will not appropriately capture the actual error process so that γ[29] and its standard error will be well-estimated. Including too many lags reduces the power of the test to reject the null of a unit root since the increased number of lags necessitates the estimation of additional parameters and a loss of degrees of freedom. The degrees of freedom decrease since the number of parameters estimated has increased and the number of usable observations has decreased[30]. As such, the presence of unnecessary lags will reduce the power of the Dickey-Fuller test to detect a unit root.

How does a careful researcher select the appropriate lag length in such circumstances?

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[28] ACF = partial autocorrelations function, PACF= partial autocorrelations function.

[29] $\Delta y_t = \mu + \gamma y_{t-1} + \delta_1 \Delta y_{t-1} + \delta_2 \Delta y_{t-2} + \ldots.. + \delta_{p-1} \Delta y_{t-p+1} + \varepsilon_t$

[30] We lose one observation for each additional lag included in the autoregression.

One approach is to start with a relatively long lag length and pare down the model by the usual $t-test$ and/or $F-test$. We can repeat the process until the lag is significantly different from zero. For example, if I tried lags p=10, and if the $t-statistic$ on lag 10 is insignificant at some specified critical value, while the $F-test$ indicates that lags 7-10 are also insignificant, we can re-estimate using only lags 1-6. By repeating the process for lag 6 and lags 4-6 until a reasonable lag length has been determined. Once a tentative lag length has been determined, diagnostic checking should be conducted. Plotting the residuals is a most important diagnostic tool. There should not appear to be any strong evidence of structural change or serial correlation. The correlogram of the residuals should appear to be white noise. The $Ljung-Box\ \ Q-$statistics should not reveal any significant autocorrelation among the residuals. In addition to the use of $F-tests$ and $t-tests$, it is also possible to determine the lag length using an information criterion such as the AIC, HQ or the SBC[31] as previously discussed. In practice, the SBC will select a more parsimonious model than will either the AIC, HQ or the $t-test$. Nevertheless, whichever method is used, the researcher must ensure that the final estimating equation contains residuals that act as white noise processes (see Ng and Perron, 1995).

I. Performing Unit Root Tests:

Using EViews as a statistical program I am running a unit root test for each series that I have, but first from the Figures 2 we visualize the series and I can specify whether to include a constant, a constant and linear trend, or neither in the test regression. This choice is important since the distribution of the test statistic under the null hypothesis differs among these three cases.

Second, I specify whether to test for a unit root in the level, first difference, or second difference of the series. If the test fails to reject the test in levels but rejects the test in

[31] AIC= Akaike Information Criterion, Akaike's (1969)
SIC= Schwarz Information Criterion, Schwarz's (1978)
HQ= Hannan – Quinn Information Criterion.

first differences, then the series contains unit root and is of integrated order one, $I(1)$. If the test fails to reject the test in levels and first differences but rejects the test in second differences, then the series contains unit roots and is of integrated order two, $I(2)$.

Third, For the ADF test, I specify the number of lagged first difference terms to add in the test regression using the previously mentioned information criteria.

From EViews[32] results for the ADF test, the test statistic is the $t-statistic$ for the lagged dependent variable in the test regression reported in $Table-1$. The null hypothesis of a unit root is rejected against the one-sided alternative, if the $t-statistic$ is less than (lies to the left of) the critical value[33]. You should note that the critical values reported by EViews are valid only for unit root tests of a data series, and will be invalid if the series is based on estimated values.

$Table-1$ reports the results of all estimations using the lag lengths suggested by the AIC and SBC, and reports ADF test results for stationarity over the series in the four regions that I study: Latin America (Panel A), East Asia (Panel B), East Europe (Panel C) and for Africa (Panel D).

$Table-1$ presents the results of the unit root test. It shows that almost all of the series are able to accept the null hypothesis of unit root. In almost all cases the ADF test statistic is higher than the critical value. The regression results show that for almost every series the null hypothesis of a unit root is not rejected at the 5 percent level. Given the critical value of the τ statistic, it is not possible to reject the null of a unit root in these series.

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[32] We use Eviews 4.1

[33] MacKinnon critical values for rejection of the hypothesis of a unit root

Unit Root Test:

$$H_0 : \gamma = 0$$

and

$$H_1 : \gamma < 0$$

The only exceptions are Pan29p06, Pan_08 and China_04, that have an estimated value of γ that is significantly different from zero at the 5 percent level, and Thai_07 and Soaf_17, that have an estimated value of γ that is significantly different from zero at the 10 percent level.

Table – 2 shows results of the unit root tests on the first difference of the series. In this case the hypothesis of a unit root is rejected for each series. Therefore, all the series are $I(1)$ processes. The entire risk premiums that are not stationary are stationary series in their 1^{st} differenced form.

4.2 Cointegration Tests

We can conduct two distinct cointegration tests: the Engle-Granger (1987) test and the Johansen (1991) test. Although the Engle-Granger test is more straightforward for cointegrating relationships between all country pairs for the risk premiums, the Johansen test has the advantage of being invariant to normalization and can reveal cointegrating relationships among more than two variables. However, because of data limitations, the Johansen test is infeasible for the entire sample of countries, and for that reason we apply the Johansen test in subsets of countries.

Here our cointegration empirics are focused on the nonstationary series[34] of the four regions of East Europe, East Asia, Africa and Latin America separately. We apply the

[34] Series identified as exhibiting unit-root behavior

Johansen test[35] to these four subsets of countries, where we first apply the test in country pairs or in different products pairs for each region, and then test in bigger groups of countries for each region.

I. How to Perform a Johansen Test

To carry out the Johansen test, we should note that since it is a test for cointegration, it is only valid when you are working with series that are known to be nonstationary. Using Eviews as statistical software, the Cointegration Test dialog asks you to provide information about the test (Deterministic trend specification and lags).

a) Deterministic Trend Specification

My series may have nonzero means and deterministic trends as well as stochastic trends. Similarly, the cointegrating equations may have intercepts and deterministic trends. Therefore, in order to carry out the test, I need to make an assumption regarding the trend underlying my data. Because I am not certain which trend assumption to use, I chose to use the function of "Summary" in Eviews to run the 5 trend assumptions. This helps me to determine the right trend assumption.

Eviews considers the following five deterministic trend cases considered by Johansen (1995, pp. 80–84):

1. The level data y_t have no deterministic trends and the cointegrating equations do not have intercepts.

2. The level data y_t have no deterministic trends and the cointegrating equations have intercepts.

3. The level data y_t have linear trends but the cointegrating equations have only intercepts.

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[35] Johansen test is a FIML test

4. The level data y_t and the cointegrating equations have linear trends.

5. The level data y_t have quadratic trends and the cointegrating equations have linear trends.

The Summary indicates the number of cointegrating relations under each of the 5 trend assumptions where I have been able to see how sensitive the results of each test were to the assumption of trend. The output displays the log likelihood and the two information criteria under each model as a model selection guide. As a user of these information criteria as a model selection guide, we select the model with the smallest information criterion.[36] Then I selected one of the five options to see the full output of the test.

b) <u>Interpreting Results of a Cointegration Test</u>

The first part of the table reports results for testing the number of cointegrating relations.

Two types of test statistics are reported.

The first block reports the *trace* statistics

$$Trace = -T \sum_{i=r+1}^{k} \log(1-\lambda_i)$$

and the second block reports the *maximum eigenvalue* statistics,

$$\lambda_{\max} = -T \log(1-\lambda_{r+1})$$

For each block, the first column is the number of cointegrating relations under the null hypothesis, the second column is the ordered eigenvalues of the Π matrix,

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[36] See Information Criteria for a discussion of the use of information criteria in model selection at Grasa (1989).

$$\Pi = \sum_{i=1}^{p} A_i - I$$

the third column is the test statistic[37], and the last two columns are the 5% and 1% critical values. The critical values are taken from Osterward-Lenum (1992). See $Table-4$.

To determine the number of cointegrating relations r, subject to the assumptions made about the trends in the series, we can proceed sequentially from $r=0$ to $r=k-1$ until we fail to reject the null hypothesis. The first row in the $Table-4$ tests the hypothesis of no cointegration, the second row tests the hypothesis of one cointegrating relation, the third_row tests the hypothesis of two cointegrating relations, and so on.

The trace statistic reported in the first block tests the null hypothesis of r Cointegrating relations against the alternative of k cointegrating relations, where k is the number of endogenous variables, for $r = 0,1,....,k-1$. The alternative of k cointegrating relations corresponds to the case where none of the series has a unit root and a stationary VAR may be specified in terms of the levels of all of the series. The trace statistic for the null hypothesis of cointegrating relations is computed as,[38]

$$LR_{tr}(r/k) = -T\sum_{i=r+1}^{k}\log(1-\lambda_i)$$

where λ_i is the $i-th$ largest eigenvalue of the Π matrix which is reported in the second column of the output $Table-4$.

The second block of the output reports the maximum eigenvalue statistic which tests the null hypothesis of r cointegrating relations against the alternative of $r+1$ cointegrating relations. This test statistic is computed as,

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[37] The first block reports the *trace* statistics and the second block reports the *maximum eigenvalue* statistics that we saw at chapter 3.

[38] LR is the Likelihood Ratio

$$LR_{\max}(r/r+1) = -T\log(1-\lambda_{r+1}) = LR_{tr}(r/k) - LR_{tr}(r+1/k)$$

for $r = 0,1,....,k-1$

II. Results from the Cointegration Test

Here our cointegration empirics are focused on the nonstationary series of the four regions of East Europe, East Asia, Africa and Latin America separately. Applying the Johansen test to these four subsets of countries, where first we apply the test in country pairs or in different products pairs with in each region, and after we test in bigger groups of countries.

$Table-3$ summarizes the Johansen test results for each region and reports the results of all estimations over the series in the four regions that I am studying: Latin America $(Table-3.1)$, East Asia $(Table-3.2)$, East Europe $(Table-3.3)$ and Africa $(Table-3.4)$.

The trace and maximum eigenvalue tests generate a much more coherent picture of the long-run relationships among countries in each region and we see that there is strong evidence of cointegration relationships. In each region, the FIML-based tests provide strong evidence of cointegration not just among countries but among different products.

In this study the main interest is to capture the link among risk premiums for each region. That is why I used multivariate cointegration techniques to test for this. It is also why from this point forward I will focus on the results that I have at the end of each $(Table-3)$, which give me the cointegration relationships for each region. These results present the Johansen test for cointegration for big groups of bonds in each of the four regions.

<u>In Panel A:</u> We have the group with Arge_FRB, Arge_09, Brazil_04, Brazil_09, Mex_05, Mex_07, URUG_03, URUG_08, Vene_07 and Vene_18. These bonds risk premiums are cointegrated at the 5% level of significance.

<u>In Panel B:</u> We have the group with Phil_10, Phil_PDI, Kor_08 and KDB_72506. These bonds risk premiums are cointegrated at the 1% level of significance.

<u>In Panel C:</u> We have the group with Rus_03, Rus_07, Rus_10, Pol_04, Pol_17, Pol_PBS_09, Bulgaria_IAB11, and Bulgaria_FLI12. These bonds risk premiums are cointegrated at the 1% level of significance.

<u>In Panel D:</u> We have the group with Israel_10, IsraelE_06, SOAF_06 and SOAF_09. These bonds risk premiums are cointegrated at the 1% level of significance.

For more detail on these Multivariate cointegration test results see $(Table-4)$. The $\lambda-\max$ and Trace test statistics indicate that there are two significant cointegrating vectors for each Panel group. Group from panel A see $(Table-4.1)$, group from panel B see $(Table-4.1)$, group from panel C see $(Table-4.1)$ and group from panel D see $(Table-4.1)$. The existence of more than one cointegrating vector indicates that the system under examination is stationary in more than one direction and, hence, more stable. These results taken together clearly support the hypothesis of cointegration among the regional Bond markets. This implies that investors can not gain substantial diversification benefits if the investors invest in major government bonds markets across each region, Eastern Europe, Africa, Latin American and the East Asia.

In the group from Panel A (Latin America) of $(Table-4.1)$ the Johansen test statistics show a rejection of the null hypothesis of no cointegrating vectors under both the trace and maximal eigenvalue forms of the test. In the case of the trace test, the null of no cointegrating vectors is rejected since the test statistic of 305.24 is greater than the 1% critical value of 279.07. Moving on to test the null of at most 1 cointegrating vector, the trace statistic is 225.89, while the 5% critical value is 222.21, so the null is only rejected at 5% (and not rejected at 1%). Finally, examining the null that there are at most 2 cointegrating vectors, the trace statistic is now well below the 5% critical value, suggesting that the null should not be rejected, thus we accept that there are 2 cointegrating vectors.

In the group from Panel B (East Asia) of (*Table* – 4.2) the Johansen test statistics show a rejection of the null hypothesis of no cointegrating vectors under both the trace and maximal eigenvalue forms of the test. In the case of the trace test, the null of no cointegrating vectors is rejected since the test statistic of 120.35 is greater than the 1% critical value of 70.05. Moving on to test the null of at most 1 cointegrating vectors, the trace statistic is 69.309, while the 1% critical value is 48.45, so the null is rejected at 1%. Finally, examining the null that there are at most 2 cointegrating vectors, the trace statistic is now well below the 5% critical value, suggesting that the null should not be rejected, thus we accept that there are 2 cointegrating vectors.

In the group from Panel C (East Europe) of (*Table* – 4.3) the Johansen test statistics show a rejection of the null hypothesis of no cointegrating vectors under both the trace and maximal eigenvalue forms of the test. In the case of the trace test, the null of no cointegrating vectors is rejected since the test statistic of 214.31 is greater than the 1% critical value of 177.20. Moving on to test the null of at most 1 cointegrating vector, the trace statistic is 139.81, while the 5% critical value is 131.79, so the null is only rejected at 5% (and not rejected at 1%). Finally, examining the null that there are at most 2 cointegrating vectors, the trace statistic is now well below the 5% critical value, suggesting that the null should not be rejected, thus we accept that there are 2 cointegrating vectors.

In the group from Panel D (Africa) of (*Table* – 4.4) the Johansen test statistics show a rejection of the null hypothesis of no cointegrating vectors under both the trace and maximal eigenvalue forms of the test. In the case of the trace test, the null of no cointegrating vectors is rejected since the test statistic of 89.95 is greater than the 1% critical value of 70.05. Moving on to test the null of at most 1 cointegrating vector, the trace statistic is 50.75, while the 1% critical value is 48.45, so the null is rejected at 1%. Finally, examining the null that there are at most 2 cointegrating vectors, the trace statistic is now well below the 5% critical value, suggesting that the null should not be rejected, thus we accept that there are 2 cointegrating vectors.

In $Figure-4$ we plot the cointegrating vectors that capture the long run stationary relationship among the risk premiums of each different group (panel).

For the group with series Arge_FRB, Arge_09, Brazil_04, Brazil_09, Mex_05, Mex_07, URUG_03, URUG_08, Vene_07 and Vene_18 see $Figure-4.1$.

For the group with series Phil_10, Phil_PDI, Kor_08 and KDB_72506 see $Figure-4.2$.

For the group with series Rus_03, Rus_07, Rus_10, Pol_04, Pol_17, Pol_PBS_09, Bulgaria_IAB11 and Bulgaria_FLI12 see $Figure-4.3$.

For the group with series Israel_10, Israel_06, SOAF_06 and SOAF_09 see $Figure-4.4$.

If we observe the plot of the different cointegrating vectors, there appears to be a fairly regular cyclical component[39] that may be related to the business cycle. Some future research may investigate these cyclical components with the business cycle.

[39] This regular cyclical component could be related to the business cycle and the uncertainty in the market. The risk premiums long run relationship must show a steady rise during and shortly after the recessions. Also, as the bond market goes into the boom period the cointegrating relationship must fall in value.

In *Figure* – 8 we compare the cointegrating vectors in different regions that capture the long-run stationary relationship among the risk premiums, and we see that the East Asian market has less fluctuation compare with the fluctuation in the Eastern Europe and Latin American , (when comparing with the Eastern Europe and Latin American markets see *Figure* – 8.4 and *Figure* – 8.5).

The Eastern Europe and Latin American markets are more volatile, while the most fluctuation is in the Latin American market (see *Figure* – 8.3).

4.3 VECM Test Results:

After establishing that the countries as a group in these Bonds markets are cointegrated (i.e., there exists a long-run relationship among these countries in each group), we next employ a Vector Error Correction Model (VECM) to tie the short-run behavior of each series to its long-run values. To examine the short-run dynamics of the series we also perform Granger causality tests by running model (2) without the error correction term, resulting in the standard Granger causality tests that we analyze in a later stage.

I. VECM Test Results for Latin America

The results for the Vector Error-Correction regression for Panel A, representing Arge_FRB, Arge_09, Brazil_04, Brazil_09, Mex_05, Mex_07, URUG_03, URUG_08, Vene_07 and Vene_18, are presented as the following. First, I present the VEC model and second, I substitute in the coefficients that I have estimated. For more analytical results see *Table* – 5, Panel A.

a) <u>VEC Model:</u>

D(ARGE_09) = A(1,1)*(B(1,1)*ARGE_09(-1) + B(1,2)*ARGE_FRB(-1) + B(1,3)*BRAZIL_04(-1) + B(1,4)*BRAZIL_09(-1) + B(1,5)*MEX_05(-1) + B(1,6)*MEX_07(-1) + B(1,7)*URUG_03(-1) + B(1,8)*URUG_08(-1) + B(1,9)*VENE_07(-1) + B(1,10)*VENE_18(-1) + B(1,11)*(@TREND(1)) + B(1,12)) + A(1,2)*(B(2,1)*ARGE_09(-1) + B(2,2)*ARGE_FRB(-1) + B(2,3)*BRAZIL_04(-1) + B(2,4)*BRAZIL_09(-1) + B(2,5)*MEX_05(-1) + B(2,6)*MEX_07(-1) + B(2,7)*URUG_03(-1) + B(2,8)*URUG_08(-1) + B(2,9)*VENE_07(-1) + B(2,10)*VENE_18(-1) + B(2,11)*(@TREND(1)) + B(2,12)) + C(1,1)*D(ARGE_09(-1)) + C(1,2)*D(ARGE_FRB(-1)) + C(1,3)*D(BRAZIL_04(-1)) + C(1,4)*D(BRAZIL_09(-1)) + C(1,5)*D(MEX_05(-1)) + C(1,6)*D(MEX_07(-1)) + C(1,7)*D(URUG_03(-1)) + C(1,8)*D(URUG_08(-1)) + C(1,9)*D(VENE_07(-1)) + C(1,10)*D(VENE_18(-1)) + C(1,11)

D(ARGE_FRB) = A(2,1)*(B(1,1)*ARGE_09(-1) + B(1,2)*ARGE_FRB(-1) + B(1,3)*BRAZIL_04(-1) + B(1,4)*BRAZIL_09(-1) + B(1,5)*MEX_05(-1) + B(1,6)*MEX_07(-1) + B(1,7)*URUG_03(-1) + B(1,8)*URUG_08(-1) + B(1,9)*VENE_07(-1) + B(1,10)*VENE_18(-1) + B(1,11)*(@TREND(1)) + B(1,12)) + A(2,2)*(B(2,1)*ARGE_09(-1) + B(2,2)*ARGE_FRB(-1) + B(2,3)*BRAZIL_04(-1) + B(2,4)*BRAZIL_09(-1) + B(2,5)*MEX_05(-1) + B(2,6)*MEX_07(-1) + B(2,7)*URUG_03(-1) + B(2,8)*URUG_08(-1) + B(2,9)*VENE_07(-1) + B(2,10)*VENE_18(-1) + B(2,11)*(@TREND(1)) + B(2,12)) + C(2,1)*D(ARGE_09(-1)) + C(2,2)*D(ARGE_FRB(-1)) + C(2,3)*D(BRAZIL_04(-1)) + C(2,4)*D(BRAZIL_09(-1)) + C(2,5)*D(MEX_05(-1)) + C(2,6)*D(MEX_07(-1)) + C(2,7)*D(URUG_03(-1)) + C(2,8)*D(URUG_08(-1)) + C(2,9)*D(VENE_07(-1)) + C(2,10)*D(VENE_18(-1)) + C(2,11)

D(BRAZIL_04) = A(3,1)*(B(1,1)*ARGE_09(-1) + B(1,2)*ARGE_FRB(-1) + B(1,3)*BRAZIL_04(-1) + B(1,4)*BRAZIL_09(-1) + B(1,5)*MEX_05(-1) + B(1,6)*MEX_07(-1) + B(1,7)*URUG_03(-1) + B(1,8)*URUG_08(-1) + B(1,9)*VENE_07(-1) + B(1,10)*VENE_18(-1) + B(1,11)*(@TREND(1)) + B(1,12)) + A(3,2)*(B(2,1)*ARGE_09(-1) + B(2,2)*ARGE_FRB(-1) + B(2,3)*BRAZIL_04(-1) + B(2,4)*BRAZIL_09(-1) + B(2,5)*MEX_05(-1) + B(2,6)*MEX_07(-1) + B(2,7)*URUG_03(-1) + B(2,8)*URUG_08(-1) + B(2,9)*VENE_07(-1) + B(2,10)*VENE_18(-1) + B(2,11)*(@TREND(1)) + B(2,12)) + C(3,1)*D(ARGE_09(-1)) + C(3,2)*D(ARGE_FRB(-1)) + C(3,3)*D(BRAZIL_04(-1)) + C(3,4)*D(BRAZIL_09(-1)) + C(3,5)*D(MEX_05(-1)) + C(3,6)*D(MEX_07(-1)) + C(3,7)*D(URUG_03(-1)) + C(3,8)*D(URUG_08(-1)) + C(3,9)*D(VENE_07(-1)) + C(3,10)*D(VENE_18(-1)) + C(3,11)

D(BRAZIL_09) = A(4,1)*(B(1,1)*ARGE_09(-1) + B(1,2)*ARGE_FRB(-1) + B(1,3)*BRAZIL_04(-1) + B(1,4)*BRAZIL_09(-1) + B(1,5)*MEX_05(-1) + B(1,6)*MEX_07(-1) + B(1,7)*URUG_03(-1) + B(1,8)*URUG_08(-1) + B(1,9)*VENE_07(-1) + B(1,10)*VENE_18(-1) + B(1,11)*(@TREND(1)) + B(1,12)) + A(4,2)*(B(2,1)*ARGE_09(-1) + B(2,2)*ARGE_FRB(-1) + B(2,3)*BRAZIL_04(-1) + B(2,4)*BRAZIL_09(-1) + B(2,5)*MEX_05(-1) + B(2,6)*MEX_07(-1) + B(2,7)*URUG_03(-1) + B(2,8)*URUG_08(-1) + B(2,9)*VENE_07(-1) + B(2,10)*VENE_18(-1) + B(2,11)*(@TREND(1)) + B(2,12)) + C(4,1)*D(ARGE_09(-1)) + C(4,2)*D(ARGE_FRB(-1)) + C(4,3)*D(BRAZIL_04(-1)) + C(4,4)*D(BRAZIL_09(-1)) + C(4,5)*D(MEX_05(-1)) + C(4,6)*D(MEX_07(-1)) + C(4,7)*D(URUG_03(-1)) + C(4,8)*D(URUG_08(-1)) + C(4,9)*D(VENE_07(-1)) + C(4,10)*D(VENE_18(-1)) + C(4,11)

D(MEX_05) = A(5,1)*(B(1,1)*ARGE_09(-1) + B(1,2)*ARGE_FRB(-1) + B(1,3)*BRAZIL_04(-1) + B(1,4)*BRAZIL_09(-1) + B(1,5)*MEX_05(-1) + B(1,6)*MEX_07(-1) + B(1,7)*URUG_03(-1) + B(1,8)*URUG_08(-1) + B(1,9)*VENE_07(-1) + B(1,10)*VENE_18(-1) + B(1,11)*(@TREND(1)) + B(1,12)) + A(5,2)*(B(2,1)*ARGE_09(-1) + B(2,2)*ARGE_FRB(-1) + B(2,3)*BRAZIL_04(-1) + B(2,4)*BRAZIL_09(-1) + B(2,5)*MEX_05(-1) + B(2,6)*MEX_07(-1) + B(2,7)*URUG_03(-1) + B(2,8)*URUG_08(-1) + B(2,9)*VENE_07(-1) + B(2,10)*VENE_18(-1) + B(2,11)*(@TREND(1)) + B(2,12)) + C(5,1)*D(ARGE_09(-1)) + C(5,2)*D(ARGE_FRB(-1)) + C(5,3)*D(BRAZIL_04(-1)) + C(5,4)*D(BRAZIL_09(-1)) + C(5,5)*D(MEX_05(-1)) + C(5,6)*D(MEX_07(-1)) + C(5,7)*D(URUG_03(-1)) + C(5,8)*D(URUG_08(-1)) + C(5,9)*D(VENE_07(-1)) + C(5,10)*D(VENE_18(-1)) + C(5,11)

D(MEX_07) = A(6,1)*(B(1,1)*ARGE_09(-1) + B(1,2)*ARGE_FRB(-1) + B(1,3)*BRAZIL_04(-1) + B(1,4)*BRAZIL_09(-1) + B(1,5)*MEX_05(-1) + B(1,6)*MEX_07(-1) + B(1,7)*URUG_03(-1) + B(1,8)*URUG_08(-1) + B(1,9)*VENE_07(-1) + B(1,10)*VENE_18(-1) + B(1,11)*(@TREND(1)) + B(1,12)) + A(6,2)*(B(2,1)*ARGE_09(-1) + B(2,2)*ARGE_FRB(-1) + B(2,3)*BRAZIL_04(-1) + B(2,4)*BRAZIL_09(-1) + B(2,5)*MEX_05(-1) + B(2,6)*MEX_07(-1) + B(2,7)*URUG_03(-1) + B(2,8)*URUG_08(-1) + B(2,9)*VENE_07(-1) + B(2,10)*VENE_18(-1) + B(2,11)*(@TREND(1)) + B(2,12)) + C(6,1)*D(ARGE_09(-1)) + C(6,2)*D(ARGE_FRB(-1)) + C(6,3)*D(BRAZIL_04(-1)) + C(6,4)*D(BRAZIL_09(-1)) + C(6,5)*D(MEX_05(-1)) + C(6,6)*D(MEX_07(-1)) + C(6,7)*D(URUG_03(-1)) + C(6,8)*D(URUG_08(-1)) + C(6,9)*D(VENE_07(-1)) + C(6,10)*D(VENE_18(-1)) + C(6,11)

D(URUG_03) = A(7,1)*(B(1,1)*ARGE_09(-1) + B(1,2)*ARGE_FRB(-1) + B(1,3)*BRAZIL_04(-1) + B(1,4)*BRAZIL_09(-1) + B(1,5)*MEX_05(-1) + B(1,6)*MEX_07(-1) + B(1,7)*URUG_03(-1) + B(1,8)*URUG_08(-1) + B(1,9)*VENE_07(-1) + B(1,10)*VENE_18(-1) + B(1,11)*(@TREND(1)) + B(1,12)) + A(7,2)*(B(2,1)*ARGE_09(-1) + B(2,2)*ARGE_FRB(-1) + B(2,3)*BRAZIL_04(-1) + B(2,4)*BRAZIL_09(-1) + B(2,5)*MEX_05(-1) + B(2,6)*MEX_07(-1) + B(2,7)*URUG_03(-1) + B(2,8)*URUG_08(-1) + B(2,9)*VENE_07(-1) + B(2,10)*VENE_18(-1) + B(2,11)*(@TREND(1)) + B(2,12)) + C(7,1)*D(ARGE_09(-1)) + C(7,2)*D(ARGE_FRB(-1)) + C(7,3)*D(BRAZIL_04(-1)) + C(7,4)*D(BRAZIL_09(-1)) + C(7,5)*D(MEX_05(-1)) + C(7,6)*D(MEX_07(-1)) + C(7,7)*D(URUG_03(-1)) + C(7,8)*D(URUG_08(-1)) + C(7,9)*D(VENE_07(-1)) + C(7,10)*D(VENE_18(-1)) + C(7,11)

D(URUG_08) = A(8,1)*(B(1,1)*ARGE_09(-1) + B(1,2)*ARGE_FRB(-1) + B(1,3)*BRAZIL_04(-1) + B(1,4)*BRAZIL_09(-1) + B(1,5)*MEX_05(-1) + B(1,6)*MEX_07(-1) + B(1,7)*URUG_03(-1) + B(1,8)*URUG_08(-1) + B(1,9)*VENE_07(-1) + B(1,10)*VENE_18(-1) + B(1,11)*(@TREND(1)) + B(1,12)) + A(8,2)*(B(2,1)*ARGE_09(-1) + B(2,2)*ARGE_FRB(-1) + B(2,3)*BRAZIL_04(-1) + B(2,4)*BRAZIL_09(-1) + B(2,5)*MEX_05(-1) + B(2,6)*MEX_07(-1) + B(2,7)*URUG_03(-1) + B(2,8)*URUG_08(-1) + B(2,9)*VENE_07(-1) + B(2,10)*VENE_18(-1) + B(2,11)*(@TREND(1)) + B(2,12)) + C(8,1)*D(ARGE_09(-1)) + C(8,2)*D(ARGE_FRB(-1)) + C(8,3)*D(BRAZIL_04(-1)) + C(8,4)*D(BRAZIL_09(-1)) + C(8,5)*D(MEX_05(-1)) + C(8,6)*D(MEX_07(-1)) + C(8,7)*D(URUG_03(-1)) + C(8,8)*D(URUG_08(-1)) + C(8,9)*D(VENE_07(-1)) + C(8,10)*D(VENE_18(-1)) + C(8,11)

D(VENE_07) = A(9,1)*(B(1,1)*ARGE_09(-1) + B(1,2)*ARGE_FRB(-1) +
B(1,3)*BRAZIL_04(-1) + B(1,4)*BRAZIL_09(-1) + B(1,5)*MEX_05(-1) +
B(1,6)*MEX_07(-1) + B(1,7)*URUG_03(-1) + B(1,8)*URUG_08(-1) +
B(1,9)*VENE_07(-1) + B(1,10)*VENE_18(-1) + B(1,11)*(@TREND(1)) + B(1,12))
+ A(9,2)*(B(2,1)*ARGE_09(-1) + B(2,2)*ARGE_FRB(-1) + B(2,3)*BRAZIL_04(-
1) + B(2,4)*BRAZIL_09(-1) + B(2,5)*MEX_05(-1) + B(2,6)*MEX_07(-1) +
B(2,7)*URUG_03(-1) + B(2,8)*URUG_08(-1) + B(2,9)*VENE_07(-1) +
B(2,10)*VENE_18(-1) + B(2,11)*(@TREND(1)) + B(2,12)) +
C(9,1)*D(ARGE_09(-1)) + C(9,2)*D(ARGE_FRB(-1)) + C(9,3)*D(BRAZIL_04(-1))
+ C(9,4)*D(BRAZIL_09(-1)) + C(9,5)*D(MEX_05(-1)) + C(9,6)*D(MEX_07(-1)) +
C(9,7)*D(URUG_03(-1)) + C(9,8)*D(URUG_08(-1)) + C(9,9)*D(VENE_07(-1)) +
C(9,10)*D(VENE_18(-1)) + C(9,11)

D(VENE_18) = A(10,1)*(B(1,1)*ARGE_09(-1) + B(1,2)*ARGE_FRB(-1) +
B(1,3)*BRAZIL_04(-1) + B(1,4)*BRAZIL_09(-1) + B(1,5)*MEX_05(-1) +
B(1,6)*MEX_07(-1) + B(1,7)*URUG_03(-1) + B(1,8)*URUG_08(-1) +
B(1,9)*VENE_07(-1) + B(1,10)*VENE_18(-1) + B(1,11)*(@TREND(1)) + B(1,12))
+ A(10,2)*(B(2,1)*ARGE_09(-1) + B(2,2)*ARGE_FRB(-1) + B(2,3)*BRAZIL_04(-
1) + B(2,4)*BRAZIL_09(-1) + B(2,5)*MEX_05(-1) + B(2,6)*MEX_07(-1) +
B(2,7)*URUG_03(-1) + B(2,8)*URUG_08(-1) + B(2,9)*VENE_07(-1) +
B(2,10)*VENE_18(-1) + B(2,11)*(@TREND(1)) + B(2,12)) +
C(10,1)*D(ARGE_09(-1)) + C(10,2)*D(ARGE_FRB(-1)) +
C(10,3)*D(BRAZIL_04(-1)) + C(10,4)*D(BRAZIL_09(-1)) + C(10,5)*D(MEX_05(-
1)) + C(10,6)*D(MEX_07(-1)) + C(10,7)*D(URUG_03(-1)) +
C(10,8)*D(URUG_08(-1)) + C(10,9)*D(VENE_07(-1)) + C(10,10)*D(VENE_18(-
1)) + C(10,11)

b) VEC Model after Substituted Coefficients:

D(ARGE_09) = - 0.01182552821*(ARGE_09(-1) - 1.11445192*BRAZIL_04(-1) - 0.2495458322*BRAZIL_09(-1) + 0.3259843744*MEX_05(-1) - 1.070310223*MEX_07(-1) + 0.120644075*URUG_03(-1) + 1.201480709*URUG_08(-1) - 9.087132131*VENE_07(-1) + 15.8635524*VENE_18(-1) - 0.008976227538*(@TREND(1)) - 45.11536885) + 0.005606515016*(ARGE_FRB(-1) - 0.8005325276*BRAZIL_04(-1) - 0.5872356551*BRAZIL_09(-1) - 12.27706844*MEX_05(-1) + 14.69363474*MEX_07(-1) + 1.269681008*URUG_03(-1) + 0.2927168724*URUG_08(-1) - 13.54911264*VENE_07(-1) + 21.73894523*VENE_18(-1) - 0.01454436816*(@TREND(1)) - 74.01582444) - 0.08386480651*D(ARGE_09(-1)) + 0.0274478518*D(ARGE_FRB(-1)) + 0.02811247216*D(BRAZIL_04(-1)) + 0.1024707857*D(BRAZIL_09(-1)) + 0.06453494161*D(MEX_05(-1)) - 0.05631349899*D(MEX_07(-1)) + 0.001850192978*D(URUG_03(-1)) - 0.04400852159*D(URUG_08(-1)) + 0.00990797702*D(VENE_07(-1)) + 0.0551524583*D(VENE_18(-1)) + 0.003703507514

D(ARGE_FRB) = - 0.02150662241*(ARGE_09(-1) - 1.11445192*BRAZIL_04(-1) - 0.2495458322*BRAZIL_09(-1) + 0.3259843744*MEX_05(-1) - 1.070310223*MEX_07(-1) + 0.120644075*URUG_03(-1) + 1.201480709*URUG_08(-1) - 9.087132131*VENE_07(-1) + 15.8635524*VENE_18(-1) - 0.008976227538*(@TREND(1)) - 45.11536885) + 0.009652128866*(ARGE_FRB(-1) - 0.8005325276*BRAZIL_04(-1) - 0.5872356551*BRAZIL_09(-1) - 12.27706844*MEX_05(-1) + 14.69363474*MEX_07(-1) + 1.269681008*URUG_03(-1) + 0.2927168724*URUG_08(-1) - 13.54911264*VENE_07(-1) + 21.73894523*VENE_18(-1) - 0.01454436816*(@TREND(1)) - 74.01582444) +

0.05357047035*D(ARGE_09(-1)) - 0.03384413541*D(ARGE_FRB(-1)) +
0.05005117032*D(BRAZIL_04(-1)) - 0.02743240521*D(BRAZIL_09(-1)) +
0.1023359317*D(MEX_05(-1)) - 0.03929211981*D(MEX_07(-1)) -
0.008719253045*D(URUG_03(-1)) - 0.1197656999*D(URUG_08(-1)) -
0.06169139307*D(VENE_07(-1)) + 0.1969793175*D(VENE_18(-1)) +
0.006082599379

D(BRAZIL_04) = - 0.005131198406*(ARGE_09(-1) - 1.11445192*BRAZIL_04(-1) - 0.2495458322*BRAZIL_09(-1) + 0.3259843744*MEX_05(-1) -
1.070310223*MEX_07(-1) + 0.120644075*URUG_03(-1) +
1.201480709*URUG_08(-1) - 9.087132131*VENE_07(-1) +
15.8635524*VENE_18(-1) - 0.008976227538*(@TREND(1)) - 45.11536885) -
1.397019986e-05*(ARGE_FRB(-1) - 0.8005325276*BRAZIL_04(-1) -
0.5872356551*BRAZIL_09(-1) - 12.27706844*MEX_05(-1) +
14.69363474*MEX_07(-1) + 1.269681008*URUG_03(-1) +
0.2927168724*URUG_08(-1) - 13.54911264*VENE_07(-1) +
21.73894523*VENE_18(-1) - 0.01454436816*(@TREND(1)) - 74.01582444) -
0.04020618749*D(ARGE_09(-1)) - 0.0038831083*D(ARGE_FRB(-1)) -
0.09076499508*D(BRAZIL_04(-1)) + 0.2126630437*D(BRAZIL_09(-1)) +
0.08697812475*D(MEX_05(-1)) - 0.006083189876*D(MEX_07(-1)) +
0.01052827946*D(URUG_03(-1)) - 0.009654920386*D(URUG_08(-1)) -
0.03591802203*D(VENE_07(-1)) - 0.07312060318*D(VENE_18(-1)) +
0.0006352596469

D(BRAZIL_09) = - 0.001719712854*(ARGE_09(-1) - 1.11445192*BRAZIL_04(-1) - 0.2495458322*BRAZIL_09(-1) + 0.3259843744*MEX_05(-1) - 1.070310223*MEX_07(-1) + 0.120644075*URUG_03(-1) + 1.201480709*URUG_08(-1) - 9.087132131*VENE_07(-1) + 15.8635524*VENE_18(-1) - 0.008976227538*(@TREND(1)) - 45.11536885) - 0.0008930014867*(ARGE_FRB(-1) - 0.8005325276*BRAZIL_04(-1) - 0.5872356551*BRAZIL_09(-1) - 12.27706844*MEX_05(-1) + 14.69363474*MEX_07(-1) + 1.269681008*URUG_03(-1) + 0.2927168724*URUG_08(-1) - 13.54911264*VENE_07(-1) + 21.73894523*VENE_18(-1) - 0.01454436816*(@TREND(1)) - 74.01582444) - 0.04137150101*D(ARGE_09(-1)) + 0.007609355268*D(ARGE_FRB(-1)) + 0.06482541179*D(BRAZIL_04(-1)) - 0.02020457964*D(BRAZIL_09(-1)) + 0.06161631339*D(MEX_05(-1)) - 0.02213146413*D(MEX_07(-1)) + 0.003465513228*D(URUG_03(-1)) - 0.001843678136*D(URUG_08(-1)) - 0.04643620494*D(VENE_07(-1)) - 0.002994977263*D(VENE_18(-1)) + 0.0003392945382

D(MEX_05) = - 0.005099371912*(ARGE_09(-1) - 1.11445192*BRAZIL_04(-1) - 0.2495458322*BRAZIL_09(-1) + 0.3259843744*MEX_05(-1) - 1.070310223*MEX_07(-1) + 0.120644075*URUG_03(-1) + 1.201480709*URUG_08(-1) - 9.087132131*VENE_07(-1) + 15.8635524*VENE_18(-1) - 0.008976227538*(@TREND(1)) - 45.11536885) + 0.00367235498*(ARGE_FRB(-1) - 0.8005325276*BRAZIL_04(-1) - 0.5872356551*BRAZIL_09(-1) - 12.27706844*MEX_05(-1) + 14.69363474*MEX_07(-1) + 1.269681008*URUG_03(-1) + 0.2927168724*URUG_08(-1) - 13.54911264*VENE_07(-1) +

21.73894523*VENE_18(-1) - 0.01454436816*(@TREND(1)) - 74.01582444) - 0.08852523952*D(ARGE_09(-1)) + 0.003336691497*D(ARGE_FRB(-1)) +

0.2727859525*D(BRAZIL_04(-1)) - 0.04191011644*D(BRAZIL_09(-1)) - 0.1619425658*D(MEX_05(-1)) + 0.1422594765*D(MEX_07(-1)) + 0.02983380978*D(URUG_03(-1)) - 0.06299627144*D(URUG_08(-1)) - 0.09360492484*D(VENE_07(-1)) + 0.0956372819*D(VENE_18(-1)) - 0.001133672765

D(MEX_07) = 0.01033319291*(ARGE_09(-1) - 1.11445192*BRAZIL_04(-1) - 0.2495458322*BRAZIL_09(-1) + 0.3259843744*MEX_05(-1) - 1.070310223*MEX_07(-1) + 0.120644075*URUG_03(-1) + 1.201480709*URUG_08(-1) - 9.087132131*VENE_07(-1) + 15.8635524*VENE_18(-1) - 0.008976227538*(@TREND(1)) - 45.11536885) - 0.007204685801*(ARGE_FRB(-1) - 0.8005325276*BRAZIL_04(-1) - 0.5872356551*BRAZIL_09(-1) - 12.27706844*MEX_05(-1) + 14.69363474*MEX_07(-1) + 1.269681008*URUG_03(-1) + 0.2927168724*URUG_08(-1) - 13.54911264*VENE_07(-1) + 21.73894523*VENE_18(-1) - 0.01454436816*(@TREND(1)) - 74.01582444) - 0.06140911686*D(ARGE_09(-1)) + 0.009147156037*D(ARGE_FRB(-1)) + 0.1614165656*D(BRAZIL_04(-1)) - 0.002849262509*D(BRAZIL_09(-1)) - 0.01737199567*D(MEX_05(-1)) - 0.03674475856*D(MEX_07(-1)) + 0.03034229003*D(URUG_03(-1)) - 0.04495338628*D(URUG_08(-1)) - 0.06917494082*D(VENE_07(-1)) + 0.0355407239*D(VENE_18(-1)) - 0.0005380202763

D(URUG_03) = 0.003920128152*(ARGE_09(-1) - 1.11445192*BRAZIL_04(-1) - 0.2495458322*BRAZIL_09(-1) + 0.3259843744*MEX_05(-1) - 1.070310223*MEX_07(-1) + 0.120644075*URUG_03(-1) + 1.201480709*URUG_08(-1) - 9.087132131*VENE_07(-1) + 15.8635524*VENE_18(-1) - 0.008976227538*(@TREND(1)) - 45.11536885) - 0.006832984314*(ARGE_FRB(-1) - 0.8005325276*BRAZIL_04(-1) - 0.5872356551*BRAZIL_09(-1) - 12.27706844*MEX_05(-1) + 14.69363474*MEX_07(-1) + 1.269681008*URUG_03(-1) + 0.2927168724*URUG_08(-1) - 13.54911264*VENE_07(-1) + 21.73894523*VENE_18(-1) - 0.01454436816*(@TREND(1)) - 74.01582444) - 0.3447930479*D(ARGE_09(-1)) + 0.1303496112*D(ARGE_FRB(-1)) + 0.1454963655*D(BRAZIL_04(-1)) + 0.1363116441*D(BRAZIL_09(-1)) + 0.4118213757*D(MEX_05(-1)) - 0.1114027764*D(MEX_07(-1)) - 0.006446793401*D(URUG_03(-1)) - 0.08676961057*D(URUG_08(-1)) - 0.5279554634*D(VENE_07(-1)) + 0.4905700707*D(VENE_18(-1)) + 0.005195402577

D(URUG_08) = - 0.008860459751*(ARGE_09(-1) - 1.11445192*BRAZIL_04(-1) - 0.2495458322*BRAZIL_09(-1) + 0.3259843744*MEX_05(-1) - 1.070310223*MEX_07(-1) + 0.120644075*URUG_03(-1) + 1.201480709*URUG_08(-1) - 9.087132131*VENE_07(-1) + 15.8635524*VENE_18(-1) - 0.008976227538*(@TREND(1)) - 45.11536885) + 0.004045433587*(ARGE_FRB(-1) - 0.8005325276*BRAZIL_04(-1) - 0.5872356551*BRAZIL_09(-1) - 12.27706844*MEX_05(-1) + 14.69363474*MEX_07(-1) + 1.269681008*URUG_03(-1) + 0.2927168724*URUG_08(-1) - 13.54911264*VENE_07(-1) + 21.73894523*VENE_18(-1) - 0.01454436816*(@TREND(1)) - 74.01582444) -

0.03598653982*D(ARGE_09(-1)) + 0.03202646006*D(ARGE_FRB(-1)) +
0.04246939543*D(BRAZIL_04(-1)) + 0.09640242986*D(BRAZIL_09(-1)) +
0.2306152321*D(MEX_05(-1)) - 0.3714394225*D(MEX_07(-1)) +
0.04545579186*D(URUG_03(-1)) - 0.04948202452*D(URUG_08(-1)) +
0.01790844888*D(VENE_07(-1)) + 0.121458153*D(VENE_18(-1)) +
0.00275138921

D(VENE_07) = 0.005012025171*(ARGE_09(-1) - 1.11445192*BRAZIL_04(-1) -
0.2495458322*BRAZIL_09(-1) + 0.3259843744*MEX_05(-1) -
1.070310223*MEX_07(-1) + 0.120644075*URUG_03(-1) +
1.201480709*URUG_08(-1) - 9.087132131*VENE_07(-1) +
15.8635524*VENE_18(-1) - 0.008976227538*(@TREND(1)) - 45.11536885) +
0.004752800265*(ARGE_FRB(-1) - 0.8005325276*BRAZIL_04(-1) -
0.5872356551*BRAZIL_09(-1) - 12.27706844*MEX_05(-1) +
14.69363474*MEX_07(-1) + 1.269681008*URUG_03(-1) +
0.2927168724*URUG_08(-1) - 13.54911264*VENE_07(-1) +
21.73894523*VENE_18(-1) - 0.01454436816*(@TREND(1)) - 74.01582444) -
0.01845761329*D(ARGE_09(-1)) - 0.04716522642*D(ARGE_FRB(-1)) +
0.1305008846*D(BRAZIL_04(-1)) + 0.06045494097*D(BRAZIL_09(-1)) +
0.1064454294*D(MEX_05(-1)) - 0.0300712523*D(MEX_07(-1)) -
0.002990297586*D(URUG_03(-1)) - 0.003327603168*D(URUG_08(-1)) -
0.2505720844*D(VENE_07(-1)) - 0.04512244587*D(VENE_18(-1)) +
0.0003948840281

D(VENE_18) = - 0.005528183228*(ARGE_09(-1) - 1.11445192*BRAZIL_04(-1) - 0.2495458322*BRAZIL_09(-1) + 0.3259843744*MEX_05(-1) - 1.070310223*MEX_07(-1) + 0.120644075*URUG_03(-1) + 1.201480709*URUG_08(-1) - 9.087132131*VENE_07(-1) + 15.8635524*VENE_18(-1) - 0.008976227538*(@TREND(1)) - 45.11536885) + 0.001956501893*(ARGE_FRB(-1) - 0.8005325276*BRAZIL_04(-1) - 0.5872356551*BRAZIL_09(-1) - 12.27706844*MEX_05(-1) + 14.69363474*MEX_07(-1) + 1.269681008*URUG_03(-1) + 0.2927168724*URUG_08(-1) - 13.54911264*VENE_07(-1) + 21.73894523*VENE_18(-1) - 0.01454436816*(@TREND(1)) - 74.01582444) - 0.05144110916*D(ARGE_09(-1)) + 0.008266892314*D(ARGE_FRB(-1)) + 0.01810949655*D(BRAZIL_04(-1)) + 0.0450522214*D(BRAZIL_09(-1)) + 0.08617244055*D(MEX_05(-1)) - 0.04580229955*D(MEX_07(-1)) + 0.009420879182*D(URUG_03(-1)) - 0.02937884445*D(URUG_08(-1)) + 0.02156660652*D(VENE_07(-1)) - 0.1121515551*D(VENE_18(-1)) + 0.0004665851609

II. VECM Test Results for East Asia

The results for the Vector Error-Correction regression for Panel B, representing Phil_10, Phil_PDI, Kor_08 and KDB_72506, are presented as the following. First, I present the VEC model and second, I substitute in the coefficients that I have estimated. For more analytical results see *Table* – 5, Panel B.

a) VEC Model:

D(KDB_72506) = A(1,1)*(B(1,1)*KDB_72506(-1) + B(1,2)*KOR_08(-1) + B(1,3)*PHIL_10(-1) + B(1,4)*PHIL_PDI(-1) + B(1,5)*(@TREND(1)) + B(1,6)) + A(1,2)*(B(2,1)*KDB_72506(-1) + B(2,2)*KOR_08(-1) + B(2,3)*PHIL_10(-1) + B(2,4)*PHIL_PDI(-1) + B(2,5)*(@TREND(1)) + B(2,6)) + C(1,1)*D(KDB_72506(-1)) + C(1,2)*D(KDB_72506(-2)) + C(1,3)*D(KOR_08(-1)) + C(1,4)*D(KOR_08(-2)) + C(1,5)*D(PHIL_10(-1)) + C(1,6)*D(PHIL_10(-2)) + C(1,7)*D(PHIL_PDI(-1)) + C(1,8)*D(PHIL_PDI(-2)) + C(1,9)

D(KOR_08) = A(2,1)*(B(1,1)*KDB_72506(-1) + B(1,2)*KOR_08(-1) + B(1,3)*PHIL_10(-1) + B(1,4)*PHIL_PDI(-1) + B(1,5)*(@TREND(1)) + B(1,6)) + A(2,2)*(B(2,1)*KDB_72506(-1) + B(2,2)*KOR_08(-1) + B(2,3)*PHIL_10(-1) + B(2,4)*PHIL_PDI(-1) + B(2,5)*(@TREND(1)) + B(2,6)) + C(2,1)*D(KDB_72506(-1)) + C(2,2)*D(KDB_72506(-2)) + C(2,3)*D(KOR_08(-1)) + C(2,4)*D(KOR_08(-2)) + C(2,5)*D(PHIL_10(-1)) + C(2,6)*D(PHIL_10(-2)) + C(2,7)*D(PHIL_PDI(-1)) + C(2,8)*D(PHIL_PDI(-2)) + C(2,9)

D(PHIL_10) = A(3,1)*(B(1,1)*KDB_72506(-1) + B(1,2)*KOR_08(-1) + B(1,3)*PHIL_10(-1) + B(1,4)*PHIL_PDI(-1) + B(1,5)*(@TREND(1)) + B(1,6)) + A(3,2)*(B(2,1)*KDB_72506(-1) + B(2,2)*KOR_08(-1) + B(2,3)*PHIL_10(-1) + B(2,4)*PHIL_PDI(-1) + B(2,5)*(@TREND(1)) + B(2,6)) + C(3,1)*D(KDB_72506(-1)) + C(3,2)*D(KDB_72506(-2)) + C(3,3)*D(KOR_08(-1)) + C(3,4)*D(KOR_08(-2)) + C(3,5)*D(PHIL_10(-1)) + C(3,6)*D(PHIL_10(-2)) + C(3,7)*D(PHIL_PDI(-1)) + C(3,8)*D(PHIL_PDI(-2)) + C(3,9)

D(PHIL_PDI) = A(4,1)*(B(1,1)*KDB_72506(-1) + B(1,2)*KOR_08(-1) + B(1,3)*PHIL_10(-1) + B(1,4)*PHIL_PDI(-1) + B(1,5)*(@TREND(1)) + B(1,6)) + A(4,2)*(B(2,1)*KDB_72506(-1) + B(2,2)*KOR_08(-1) + B(2,3)*PHIL_10(-1) + B(2,4)*PHIL_PDI(-1) + B(2,5)*(@TREND(1)) + B(2,6)) + C(4,1)*D(KDB_72506(-1)) + C(4,2)*D(KDB_72506(-2)) + C(4,3)*D(KOR_08(-1)) + C(4,4)*D(KOR_08(-2)) + C(4,5)*D(PHIL_10(-1)) + C(4,6)*D(PHIL_10(-2)) + C(4,7)*D(PHIL_PDI(-1)) + C(4,8)*D(PHIL_PDI(-2)) + C(4,9)

b) VEC Model after Substituted Coefficients:

D(KDB_72506) = - 0.1689140553*(KDB_72506(-1) - 0.2504782732*PHIL_10(-1) - 0.6164306729*PHIL_PDI(-1) + 0.001264458033*(@TREND(1)) - 0.3331719313) + 0.04889640844*(KOR_08(-1) - 0.4085756757*PHIL_10(-1) - 0.4143767198*PHIL_PDI(-1) + 0.001271595745*(@TREND(1)) - 0.5597581763) - 0.1371419964*D(KDB_72506(-1)) - 0.1511767625*D(KDB_72506(-2)) + 0.01013835541*D(KOR_08(-1)) - 0.02115680136*D(KOR_08(-2)) + 0.1342678303*D(PHIL_10(-1)) + 0.02180679272*D(PHIL_10(-2)) - 0.04624768527*D(PHIL_PDI(-1)) + 0.006446960252*D(PHIL_PDI(-2)) - 0.00101674818

D(KOR_08) = 0.008203037217*(KDB_72506(-1) - 0.2504782732*PHIL_10(-1) - 0.6164306729*PHIL_PDI(-1) + 0.001264458033*(@TREND(1)) - 0.3331719313) - 0.1730938494*(KOR_08(-1) - 0.4085756757*PHIL_10(-1) - 0.4143767198*PHIL_PDI(-1) + 0.001271595745*(@TREND(1)) - 0.5597581763) + 0.07543611971*D(KDB_72506(-1)) - 0.02274738899*D(KDB_72506(-2)) - 0.3183913007*D(KOR_08(-1)) - 0.1632909802*D(KOR_08(-2)) + 0.1861280195*D(PHIL_10(-1)) + 0.1636840052*D(PHIL_10(-2)) + 0.05742795661*D(PHIL_PDI(-1)) + 0.0378481418*D(PHIL_PDI(-2)) - 0.000776202366

D(PHIL_10) = - 0.02084273467*(KDB_72506(-1) - 0.2504782732*PHIL_10(-1) - 0.6164306729*PHIL_PDI(-1) + 0.001264458033*(@TREND(1)) - 0.3331719313) + 0.0240878089*(KOR_08(-1) - 0.4085756757*PHIL_10(-1) - 0.4143767198*PHIL_PDI(-1) + 0.001271595745*(@TREND(1)) - 0.5597581763) + 0.02481435368*D(KDB_72506(-1)) + 0.01761761703*D(KDB_72506(-2)) - 0.01685576789*D(KOR_08(-1)) - 0.02544124498*D(KOR_08(-2)) + 0.06915896681*D(PHIL_10(-1)) - 0.03952905133*D(PHIL_10(-2)) + 0.05070455223*D(PHIL_PDI(-1)) + 0.05248918937*D(PHIL_PDI(-2)) - 0.0004477375028

D(PHIL_PDI) = - 0.009190945394*(KDB_72506(-1) - 0.2504782732*PHIL_10(-1) - 0.6164306729*PHIL_PDI(-1) + 0.001264458033*(@TREND(1)) - 0.3331719313) + 0.07958471888*(KOR_08(-1) - 0.4085756757*PHIL_10(-1) - 0.4143767198*PHIL_PDI(-1) + 0.001271595745*(@TREND(1)) - 0.5597581763) + 0.04581208409*D(KDB_72506(-1)) + 0.07770688918*D(KDB_72506(-2)) - 0.001353999899*D(KOR_08(-1)) - 0.04995440391*D(KOR_08(-2)) + 0.1033848461*D(PHIL_10(-1)) + 0.06206118239*D(PHIL_10(-2)) - 0.2347382945*D(PHIL_PDI(-1)) - 0.1570831198*D(PHIL_PDI(-2)) + 0.0004991925568

III. VECM Test Results for East Europe

The results for the Vector Error-Correction regression for Panel C, representing Rus_03, Rus_07, Rus_10, Pol_04, Pol_17, Pol_PBS_09, Bulgaria_IAB11 and Bulgaria_FLI12, are presented as the following. First I, present the VEC model and second, I substitute in the coefficients that I have estimated. For more analytical results see *Table* – 5, Panel C.

a) VEC Model:

D(BULGARIA_FLI12) = A(1,1)*(B(1,1)*BULGARIA_FLI12(-1) + B(1,2)*BULGARIA_IAB11(-1) + B(1,3)*POL_04(-1) + B(1,4)*POL_17(-1) + B(1,5)*POL_PBS_09(-1) + B(1,6)*RUS_03(-1) + B(1,7)*RUS_07(-1) + B(1,8)*RUS_10(-1) + B(1,9)) + A(1,2)*(B(2,1)*BULGARIA_FLI12(-1) + B(2,2)*BULGARIA_IAB11(-1) + B(2,3)*POL_04(-1) + B(2,4)*POL_17(-1) + B(2,5)*POL_PBS_09(-1) + B(2,6)*RUS_03(-1) + B(2,7)*RUS_07(-1) + B(2,8)*RUS_10(-1) + B(2,9)) + C(1,1)*D(BULGARIA_FLI12(-1)) + C(1,2)*D(BULGARIA_IAB11(-1)) + C(1,3)*D(POL_04(-1)) + C(1,4)*D(POL_17(-1)) + C(1,5)*D(POL_PBS_09(-1)) + C(1,6)*D(RUS_03(-1)) + C(1,7)*D(RUS_07(-1)) + C(1,8)*D(RUS_10(-1))

D(BULGARIA_IAB11) = A(2,1)*(B(1,1)*BULGARIA_FLI12(-1) + B(1,2)*BULGARIA_IAB11(-1) + B(1,3)*POL_04(-1) + B(1,4)*POL_17(-1) + B(1,5)*POL_PBS_09(-1) + B(1,6)*RUS_03(-1) + B(1,7)*RUS_07(-1) + B(1,8)*RUS_10(-1) + B(1,9)) + A(2,2)*(B(2,1)*BULGARIA_FLI12(-1) + B(2,2)*BULGARIA_IAB11(-1) + B(2,3)*POL_04(-1) + B(2,4)*POL_17(-1) + B(2,5)*POL_PBS_09(-1) + B(2,6)*RUS_03(-1) + B(2,7)*RUS_07(-1) + B(2,8)*RUS_10(-1) + B(2,9)) + C(2,1)*D(BULGARIA_FLI12(-1)) + C(2,2)*D(BULGARIA_IAB11(-1)) + C(2,3)*D(POL_04(-1)) + C(2,4)*D(POL_17(-1)) + C(2,5)*D(POL_PBS_09(-1)) + C(2,6)*D(RUS_03(-1)) + C(2,7)*D(RUS_07(-1)) + C(2,8)*D(RUS_10(-1))

D(POL_04) = A(3,1)*(B(1,1)*BULGARIA_FLI12(-1) + B(1,2)*BULGARIA_IAB11(-1) + B(1,3)*POL_04(-1) + B(1,4)*POL_17(-1) + B(1,5)*POL_PBS_09(-1) + B(1,6)*RUS_03(-1) + B(1,7)*RUS_07(-1) + B(1,8)*RUS_10(-1) + B(1,9)) + A(3,2)*(B(2,1)*BULGARIA_FLI12(-1) + B(2,2)*BULGARIA_IAB11(-1) + B(2,3)*POL_04(-1) + B(2,4)*POL_17(-1) + B(2,5)*POL_PBS_09(-1) + B(2,6)*RUS_03(-1) + B(2,7)*RUS_07(-1) + B(2,8)*RUS_10(-1) + B(2,9)) + C(3,1)*D(BULGARIA_FLI12(-1)) + C(3,2)*D(BULGARIA_IAB11(-1)) + C(3,3)*D(POL_04(-1)) + C(3,4)*D(POL_17(-1)) + C(3,5)*D(POL_PBS_09(-1)) + C(3,6)*D(RUS_03(-1)) + C(3,7)*D(RUS_07(-1)) + C(3,8)*D(RUS_10(-1))

D(POL_17) = A(4,1)*(B(1,1)*BULGARIA_FLI12(-1) + B(1,2)*BULGARIA_IAB11(-1) + B(1,3)*POL_04(-1) + B(1,4)*POL_17(-1) + B(1,5)*POL_PBS_09(-1) + B(1,6)*RUS_03(-1) + B(1,7)*RUS_07(-1) + B(1,8)*RUS_10(-1) + B(1,9)) + A(4,2)*(B(2,1)*BULGARIA_FLI12(-1) + B(2,2)*BULGARIA_IAB11(-1) + B(2,3)*POL_04(-1) + B(2,4)*POL_17(-1) + B(2,5)*POL_PBS_09(-1) + B(2,6)*RUS_03(-1) + B(2,7)*RUS_07(-1) + B(2,8)*RUS_10(-1) + B(2,9)) + C(4,1)*D(BULGARIA_FLI12(-1)) + C(4,2)*D(BULGARIA_IAB11(-1)) + C(4,3)*D(POL_04(-1)) + C(4,4)*D(POL_17(-1)) + C(4,5)*D(POL_PBS_09(-1)) + C(4,6)*D(RUS_03(-1)) + C(4,7)*D(RUS_07(-1)) + C(4,8)*D(RUS_10(-1))

D(POL_PBS_09) = A(5,1)*(B(1,1)*BULGARIA_FLI12(-1) + B(1,2)*BULGARIA_IAB11(-1) + B(1,3)*POL_04(-1) + B(1,4)*POL_17(-1) + B(1,5)*POL_PBS_09(-1) + B(1,6)*RUS_03(-1) + B(1,7)*RUS_07(-1) + B(1,8)*RUS_10(-1) + B(1,9)) + A(5,2)*(B(2,1)*BULGARIA_FLI12(-1) + B(2,2)*BULGARIA_IAB11(-1) + B(2,3)*POL_04(-1) + B(2,4)*POL_17(-1) + B(2,5)*POL_PBS_09(-1) + B(2,6)*RUS_03(-1) + B(2,7)*RUS_07(-1) + B(2,8)*RUS_10(-1) + B(2,9)) + C(5,1)*D(BULGARIA_FLI12(-1)) + C(5,2)*D(BULGARIA_IAB11(-1)) + C(5,3)*D(POL_04(-1)) + C(5,4)*D(POL_17(-1)) + C(5,5)*D(POL_PBS_09(-1)) + C(5,6)*D(RUS_03(-1)) + C(5,7)*D(RUS_07(-1)) + C(5,8)*D(RUS_10(-1))

D(RUS_03) = A(6,1)*(B(1,1)*BULGARIA_FLI12(-1) + B(1,2)*BULGARIA_IAB11(-1) + B(1,3)*POL_04(-1) + B(1,4)*POL_17(-1) + B(1,5)*POL_PBS_09(-1) + B(1,6)*RUS_03(-1) + B(1,7)*RUS_07(-1) + B(1,8)*RUS_10(-1) + B(1,9)) + A(6,2)*(B(2,1)*BULGARIA_FLI12(-1) + B(2,2)*BULGARIA_IAB11(-1) + B(2,3)*POL_04(-1) + B(2,4)*POL_17(-1) + B(2,5)*POL_PBS_09(-1) + B(2,6)*RUS_03(-1) + B(2,7)*RUS_07(-1) + B(2,8)*RUS_10(-1) + B(2,9)) + C(6,1)*D(BULGARIA_FLI12(-1)) + C(6,2)*D(BULGARIA_IAB11(-1)) + C(6,3)*D(POL_04(-1)) + C(6,4)*D(POL_17(-1)) + C(6,5)*D(POL_PBS_09(-1)) + C(6,6)*D(RUS_03(-1)) + C(6,7)*D(RUS_07(-1)) + C(6,8)*D(RUS_10(-1))

D(RUS_07) = A(7,1)*(B(1,1)*BULGARIA_FLI12(-1) + B(1,2)*BULGARIA_IAB11(-1) + B(1,3)*POL_04(-1) + B(1,4)*POL_17(-1) + B(1,5)*POL_PBS_09(-1) + B(1,6)*RUS_03(-1) + B(1,7)*RUS_07(-1) + B(1,8)*RUS_10(-1) + B(1,9)) + A(7,2)*(B(2,1)*BULGARIA_FLI12(-1) + B(2,2)*BULGARIA_IAB11(-1) + B(2,3)*POL_04(-1) + B(2,4)*POL_17(-1) + B(2,5)*POL_PBS_09(-1) + B(2,6)*RUS_03(-1) + B(2,7)*RUS_07(-1) + B(2,8)*RUS_10(-1) + B(2,9)) + C(7,1)*D(BULGARIA_FLI12(-1)) + C(7,2)*D(BULGARIA_IAB11(-1)) + C(7,3)*D(POL_04(-1)) + C(7,4)*D(POL_17(-1)) + C(7,5)*D(POL_PBS_09(-1)) + C(7,6)*D(RUS_03(-1)) + C(7,7)*D(RUS_07(-1)) + C(7,8)*D(RUS_10(-1))

D(RUS_10) = A(8,1)*(B(1,1)*BULGARIA_FLI12(-1) + B(1,2)*BULGARIA_IAB11(-1) + B(1,3)*POL_04(-1) + B(1,4)*POL_17(-1) + B(1,5)*POL_PBS_09(-1) + B(1,6)*RUS_03(-1) + B(1,7)*RUS_07(-1) + B(1,8)*RUS_10(-1) + B(1,9)) + A(8,2)*(B(2,1)*BULGARIA_FLI12(-1) + B(2,2)*BULGARIA_IAB11(-1) + B(2,3)*POL_04(-1) + B(2,4)*POL_17(-1) + B(2,5)*POL_PBS_09(-1) + B(2,6)*RUS_03(-1) + B(2,7)*RUS_07(-1) + B(2,8)*RUS_10(-1) + B(2,9)) + C(8,1)*D(BULGARIA_FLI12(-1)) + C(8,2)*D(BULGARIA_IAB11(-1)) + C(8,3)*D(POL_04(-1)) + C(8,4)*D(POL_17(-1)) + C(8,5)*D(POL_PBS_09(-1)) + C(8,6)*D(RUS_03(-1)) + C(8,7)*D(RUS_07(-1)) + C(8,8)*D(RUS_10(-1))

b) VEC Model after Substituted Coefficients:

D(BULGARIA_FLI12) = - 0.039178696*(BULGARIA_FLI12(-1) + 2.871129869*POL_04(-1) - 0.6821811691*POL_17(-1) - 1.532939758*POL_PBS_09(-1) + 0.5979009785*RUS_03(-1) - 1.110582765*RUS_07(-1) - 1.460259813*RUS_10(-1) + 5.246282612) + 0.03198796144*(BULGARIA_IAB11(-1) + 3.53611495*POL_04(-1) - 0.4296141587*POL_17(-1) - 2.078832275*POL_PBS_09(-1) + 0.6839351933*RUS_03(-1) - 1.030952228*RUS_07(-1) - 1.747227354*RUS_10(-1) + 4.65874974) - 0.1194981541*D(BULGARIA_FLI12(-1)) + 0.1288926781*D(BULGARIA_IAB11(-1)) + 0.006286680647*D(POL_04(-1)) - 0.03136192435*D(POL_17(-1)) + 0.009060627491*D(POL_PBS_09(-1)) - 0.0725003913*D(RUS_03(-1)) - 0.01285947175*D(RUS_07(-1)) + 0.2356777466*D(RUS_10(-1))

D(BULGARIA_IAB11) = 0.01863763481*(BULGARIA_FLI12(-1) + 2.871129869*POL_04(-1) - 0.6821811691*POL_17(-1) - 1.532939758*POL_PBS_09(-1) + 0.5979009785*RUS_03(-1) - 1.110582765*RUS_07(-1) - 1.460259813*RUS_10(-1) + 5.246282612) - 0.01648353362*(BULGARIA_IAB11(-1) + 3.53611495*POL_04(-1) - 0.4296141587*POL_17(-1) - 2.078832275*POL_PBS_09(-1) + 0.6839351933*RUS_03(-1) - 1.030952228*RUS_07(-1) - 1.747227354*RUS_10(-1) + 4.65874974) + 0.080569871*D(BULGARIA_FLI12(-1)) - 0.1139394857*D(BULGARIA_IAB11(-1)) + 0.001341129185*D(POL_04(-1)) - 0.02247473014*D(POL_17(-1)) - 0.0009416143534*D(POL_PBS_09(-1)) - 0.03623824671*D(RUS_03(-1)) + 0.01245773069*D(RUS_07(-1)) + 0.1767973107*D(RUS_10(-1))

D(POL_04) = 0.5304857721*(BULGARIA_FLI12(-1) + 2.871129869*POL_04(-1) - 0.6821811691*POL_17(-1) - 1.532939758*POL_PBS_09(-1) + 0.5979009785*RUS_03(-1) - 1.110582765*RUS_07(-1) - 1.460259813*RUS_10(-1) + 5.246282612) - 0.4941886097*(BULGARIA_IAB11(-1) + 3.53611495*POL_04(-1) - 0.4296141587*POL_17(-1) - 2.078832275*POL_PBS_09(-1) + 0.6839351933*RUS_03(-1) - 1.030952228*RUS_07(-1) - 1.747227354*RUS_10(-1) + 4.65874974) - 0.6712439509*D(BULGARIA_FLI12(-1)) + 0.4196998461*D(BULGARIA_IAB11(-1)) - 0.2769082071*D(POL_04(-1)) - 0.314637928*D(POL_17(-1)) + 0.006866722849*D(POL_PBS_09(-1)) + 0.4682758019*D(RUS_03(-1)) + 0.01533562566*D(RUS_07(-1)) - 0.1097502034*D(RUS_10(-1))

D(POL_17) = 0.4002616156*(BULGARIA_FLI12(-1) + 2.871129869*POL_04(-1) - 0.6821811691*POL_17(-1) - 1.532939758*POL_PBS_09(-1) + 0.5979009785*RUS_03(-1) - 1.110582765*RUS_07(-1) - 1.460259813*RUS_10(-1) + 5.246282612) - 0.3276428735*(BULGARIA_IAB11(-1) + 3.53611495*POL_04(-1) - 0.4296141587*POL_17(-1) - 2.078832275*POL_PBS_09(-1) + 0.6839351933*RUS_03(-1) - 1.030952228*RUS_07(-1) - 1.747227354*RUS_10(-1) + 4.65874974) - 0.5344057351*D(BULGARIA_FLI12(-1)) + 0.4275876405*D(BULGARIA_IAB11(-1)) - 0.02475586814*D(POL_04(-1)) - 0.2729606979*D(POL_17(-1)) + 0.1089533182*D(POL_PBS_09(-1)) + 0.1810832479*D(RUS_03(-1)) + 0.2616727503*D(RUS_07(-1)) - 0.3132187243*D(RUS_10(-1))

D(POL_PBS_09) = - 0.02378850207*(BULGARIA_FLI12(-1) + 2.871129869*POL_04(-1) - 0.6821811691*POL_17(-1) - 1.532939758*POL_PBS_09(-1) + 0.5979009785*RUS_03(-1) - 1.110582765*RUS_07(-1) - 1.460259813*RUS_10(-1) + 5.246282612) + 0.02672701567*(BULGARIA_IAB11(-1) + 3.53611495*POL_04(-1) - 0.4296141587*POL_17(-1) - 2.078832275*POL_PBS_09(-1) + 0.6839351933*RUS_03(-1) - 1.030952228*RUS_07(-1) - 1.747227354*RUS_10(-1) + 4.65874974) - 0.07687365529*D(BULGARIA_FLI12(-1)) - 0.001484712023*D(BULGARIA_IAB11(-1)) + 0.008151071572*D(POL_04(-1)) - 0.02217379101*D(POL_17(-1)) - 0.1856302081*D(POL_PBS_09(-1)) + 0.1424570681*D(RUS_03(-1)) - 0.02450221033*D(RUS_07(-1)) + 0.008950845027*D(RUS_10(-1))

D(RUS_03) = 0.1022667478*(BULGARIA_FLI12(-1) + 2.871129869*POL_04(-1) - 0.6821811691*POL_17(-1) - 1.532939758*POL_PBS_09(-1) + 0.5979009785*RUS_03(-1) - 1.110582765*RUS_07(-1) - 1.460259813*RUS_10(-1) + 5.246282612) - 0.07669390694*(BULGARIA_IAB11(-1) + 3.53611495*POL_04(-1) - 0.4296141587*POL_17(-1) - 2.078832275*POL_PBS_09(-1) + 0.6839351933*RUS_03(-1) - 1.030952228*RUS_07(-1) - 1.747227354*RUS_10(-1) + 4.65874974) + 0.03074844006*D(BULGARIA_FLI12(-1)) - 0.02164380427*D(BULGARIA_IAB11(-1)) + 0.004226853798*D(POL_04(-1)) - 0.01804982468*D(POL_17(-1)) + 0.02532637622*D(POL_PBS_09(-1)) - 0.2143404051*D(RUS_03(-1)) + 0.05443387746*D(RUS_07(-1)) + 0.3149190281*D(RUS_10(-1))

D(RUS_07) = 0.09715396296*(BULGARIA_FLI12(-1) + 2.871129869*POL_04(-1) - 0.6821811691*POL_17(-1) - 1.532939758*POL_PBS_09(-1) + 0.5979009785*RUS_03(-1) - 1.110582765*RUS_07(-1) - 1.460259813*RUS_10(-1) + 5.246282612) - 0.07590071756*(BULGARIA_IAB11(-1) + 3.53611495*POL_04(-1) - 0.4296141587*POL_17(-1) - 2.078832275*POL_PBS_09(-1) + 0.6839351933*RUS_03(-1) - 1.030952228*RUS_07(-1) - 1.747227354*RUS_10(-1) + 4.65874974) - 0.006243132847*D(BULGARIA_FLI12(-1)) + 0.06876686322*D(BULGARIA_IAB11(-1)) + 0.0001226156941*D(POL_04(-1)) + 0.01201304379*D(POL_17(-1)) - 0.02367809311*D(POL_PBS_09(-1)) + 0.02117499351*D(RUS_03(-1)) - 0.159669391*D(RUS_07(-1)) + 0.2487744333*D(RUS_10(-1))

D(RUS_10) = 0.07077146125*(BULGARIA_FLI12(-1) + 2.871129869*POL_04(-1) - 0.6821811691*POL_17(-1) - 1.532939758*POL_PBS_09(-1) + 0.5979009785*RUS_03(-1) - 1.110582765*RUS_07(-1) - 1.460259813*RUS_10(-1) + 5.246282612) - 0.05602011025*(BULGARIA_IAB11(-1) + 3.53611495*POL_04(-1) - 0.4296141587*POL_17(-1) - 2.078832275*POL_PBS_09(-1) + 0.6839351933*RUS_03(-1) - 1.030952228*RUS_07(-1) - 1.747227354*RUS_10(-1) + 4.65874974) - 0.004191301712*D(BULGARIA_FLI12(-1)) + 0.03779561229*D(BULGARIA_IAB11(-1)) + 0.004850394284*D(POL_04(-1)) + 0.008693459358*D(POL_17(-1)) - 0.008228788882*D(POL_PBS_09(-1)) - 0.02079330725*D(RUS_03(-1)) + 0.1632774444*D(RUS_07(-1)) - 0.04475763369*D(RUS_10(-1))

IV. VECM Test Results for Africa

The results for the Vector Error-Correction regression for Panel D, representing Israel_10, SOAF_06, SOAF_09, Egypt_06 and Egypt_11, are presented as the following. First, I present the VEC model and second, I substitute in the coefficients that I have estimated. For more analytical results see *Table* – 5, Panel D.

a) VEC Model:

D(ISRAEL_10) = A(1,1)*(B(1,1)*ISRAEL_10(-1) + B(1,2)*ISRAELE_06(-1) + B(1,3)*SOAF_06(-1) + B(1,4)*SOAF_09(-1) + B(1,5)*(@TREND(1)) + B(1,6)) + A(1,2)*(B(2,1)*ISRAEL_10(-1) + B(2,2)*ISRAELE_06(-1) + B(2,3)*SOAF_06(-1) + B(2,4)*SOAF_09(-1) + B(2,5)*(@TREND(1)) + B(2,6)) + C(1,1)*D(ISRAEL_10(-1)) + C(1,2)*D(ISRAELE_06(-1)) + C(1,3)*D(SOAF_06(-1)) + C(1,4)*D(SOAF_09(-1)) + C(1,5)

D(ISRAELE_06) = A(2,1)*(B(1,1)*ISRAEL_10(-1) + B(1,2)*ISRAELE_06(-1) + B(1,3)*SOAF_06(-1) + B(1,4)*SOAF_09(-1) + B(1,5)*(@TREND(1)) + B(1,6)) + A(2,2)*(B(2,1)*ISRAEL_10(-1) + B(2,2)*ISRAELE_06(-1) + B(2,3)*SOAF_06(-1) + B(2,4)*SOAF_09(-1) + B(2,5)*(@TREND(1)) + B(2,6)) + C(2,1)*D(ISRAEL_10(-1)) + C(2,2)*D(ISRAELE_06(-1)) + C(2,3)*D(SOAF_06(-1)) + C(2,4)*D(SOAF_09(-1)) + C(2,5)

D(SOAF_06) = A(3,1)*(B(1,1)*ISRAEL_10(-1) + B(1,2)*ISRAELE_06(-1) + B(1,3)*SOAF_06(-1) + B(1,4)*SOAF_09(-1) + B(1,5)*(@TREND(1)) + B(1,6)) + A(3,2)*(B(2,1)*ISRAEL_10(-1) + B(2,2)*ISRAELE_06(-1) + B(2,3)*SOAF_06(-1) + B(2,4)*SOAF_09(-1) + B(2,5)*(@TREND(1)) + B(2,6)) + C(3,1)*D(ISRAEL_10(-1)) + C(3,2)*D(ISRAELE_06(-1)) + C(3,3)*D(SOAF_06(-1)) + C(3,4)*D(SOAF_09(-1)) + C(3,5)

D(SOAF_09) = A(4,1)*(B(1,1)*ISRAEL_10(-1) + B(1,2)*ISRAELE_06(-1) + B(1,3)*SOAF_06(-1) + B(1,4)*SOAF_09(-1) + B(1,5)*(@TREND(1)) + B(1,6)) + A(4,2)*(B(2,1)*ISRAEL_10(-1) + B(2,2)*ISRAELE_06(-1) + B(2,3)*SOAF_06(-1) + B(2,4)*SOAF_09(-1) + B(2,5)*(@TREND(1)) + B(2,6)) + C(4,1)*D(ISRAEL_10(-1)) + C(4,2)*D(ISRAELE_06(-1)) + C(4,3)*D(SOAF_06(-1)) + C(4,4)*D(SOAF_09(-1)) + C(4,5)

b) VEC Model after Substituted Coefficients:

D(ISRAEL_10) = - 0.01044134662*(ISRAEL_10(-1) + 1.445034467*SOAF_06(-1) + 0.937548781*SOAF_09(-1) + 0.002585649262*(@TREND(1)) - 20.01749899) - 0.00416775038*(ISRAELE_06(-1) - 5.27304704*SOAF_06(-1) + 5.20823614*SOAF_09(-1) - 0.0004143631906*(@TREND(1)) - 5.016189109) - 0.09507716611*D(ISRAEL_10(-1)) - 0.02735437551*D(ISRAELE_06(-1)) - 0.03140509055*D(SOAF_06(-1)) + 0.06540809995*D(SOAF_09(-1)) + 0.0004563088517

D(ISRAELE_06) = - 0.008143605284*(ISRAEL_10(-1) + 1.445034467*SOAF_06(-1) + 0.937548781*SOAF_09(-1) + 0.002585649262*(@TREND(1)) - 20.01749899) - 0.01092108379*(ISRAELE_06(-1) - 5.27304704*SOAF_06(-1) + 5.20823614*SOAF_09(-1) - 0.0004143631906*(@TREND(1)) - 5.016189109) + 0.05100306597*D(ISRAEL_10(-1)) - 0.09172733556*D(ISRAELE_06(-1)) - 0.07104603176*D(SOAF_06(-1)) + 0.0346265786*D(SOAF_09(-1)) - 0.0004011215679

D(SOAF_06) = - 0.01446142964*(ISRAEL_10(-1) + 1.445034467*SOAF_06(-1) + 0.937548781*SOAF_09(-1) + 0.002585649262*(@TREND(1)) - 20.01749899) + 0.02383162193*(ISRAELE_06(-1) - 5.27304704*SOAF_06(-1) + 5.20823614*SOAF_09(-1) - 0.0004143631906*(@TREND(1)) - 5.016189109) + 0.03058270642*D(ISRAEL_10(-1)) + 0.04665979185*D(ISRAELE_06(-1)) - 0.1910241548*D(SOAF_06(-1)) + 0.05108129371*D(SOAF_09(-1)) - 0.0003042200967

D(SOAF_09) = - 0.01940178678*(ISRAEL_10(-1) + 1.445034467*SOAF_06(-1) + 0.937548781*SOAF_09(-1) + 0.002585649262*(@TREND(1)) - 20.01749899) - 0.001998350975*(ISRAELE_06(-1) - 5.27304704*SOAF_06(-1) + 5.20823614*SOAF_09(-1) - 0.0004143631906*(@TREND(1)) - 5.016189109) + 0.005413467631*D(ISRAEL_10(-1)) + 0.04169184185*D(ISRAELE_06(-1)) - 0.006427946711*D(SOAF_06(-1)) - 0.1553719676*D(SOAF_09(-1)) - 0.0001197921107

V. Explanation of Test Results

All the coefficients A, of the error-correction model represent the adjustment parameters (speed-of-adjustment parameters)[40]. All the coefficients B, from the above results represent the long-run cointegrating vectors and the coefficients C, represent the short-run relationships.

In general, the coefficients A, (speed-of-adjustment parameters) are higher in East Europe than the other three regions, Latin America, Africa and East Asia, and

[40] Since the speed-of-adjustment parameters are small in value the values adjust relatively slowly to changes to the equilibrium relationship.

because of this the values adjust relatively faster to changes to the equilibrium relationship.

Diagnostic tests for VEC

Further more, the diagnostic shows that there is not a diagnostic problem with the VEC system. Normality is not rejected, and there are no problems regarding autocorrelation, and autoregressive conditional heteroscedasticity. Also homoscedastcity of the residuals is not rejected as well.

After we estimate the Vector Error Correction Model (VECM) the next step is to test for causality.

4.4 Granger Causality Results Based on the Error-Correction Model (ECM)

I. Causality Tests

In this section we present the empirical evidence from the causality tests, Granger causality test results are based on the corresponding Vector Error Correction Models (VECM) and we can answer the question of the direction of causality.

The appropriate way to test for causality depends on whether or not there exists cointegrating relations. When there are cointegration relations, we can test for short-run causality using an $F-test$ of the significance of the lagged differences of the relevant variables. And we can test for long-run causality by using a $t-test$ of the significance of the error correction term[41]. Some empirical references are Khalid and Guan (1999), Wernerheim (2000) and Hayo (1999).

[41] We test the coefficients of the error correction term that are often referred to as the speed – of – adjustment parameters. They reflect the response with which the system of the

The estimation of the VEC model allows testing for Granger causality. Particularly, each equation can be tested to determine whether any of the two right-hand-side variables cause the left-hand-side variable. The null hypothesis of noncausality can be rejected not only if one finds significant the lagged logarithmic differences $(F-test)$ of a particular variable in any of the equations, but also if one finds significant the coefficient of the lagged error correction term $(t-test)$. According to Sims, Stock and Watson (1990), the $t-ratio$ of the coefficient of the error correction term follows an asymptotic standard normal distribution.[42]

As previously mentioned, according to Granger (1988), causality within the framework of the VEC model can occur in two different ways. The first way is through the impact of the lagged differences of a right-hand-side variable. The second way is through the error correction term, which is a function of the one-period lagged values of the variable. Granger suggest that the impact of the lagged difference of a right-hand-side variable on the left-hand-side variable captures the short-run dynamics of the system and therefore can be interpreted as short-run causality. The impact of the one –period lagged error correction term on the left-hand-side variable captures the extent that the variables are out of equilibrium: thus, it can be interpreted as long-run causality. Toda and Philips (1994), distinguish the two parts of the hypothesis as "short-run noncausality" and "long-run noncausality."

For example if we have the VEC Model listed previously for the Latin American region:

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cointegrated variables have moved back to their long-run equilibrium relationship. The larger the coefficients of the error correction term, the greater the response of the cointegrated variables to move back to their long-run equilibrium relationship. Thus, the coefficients capture the effect of the deviation of variables from their long-run equilibrium.

[42] The error correction term is a stationary variable with a zero mean.

D(ARGE_09) = A(1,1)*(B(1,1)*ARGE_09(-1) + B(1,2)*ARGE_FRB(-1) + B(1,3)*BRAZIL_04(-1) + B(1,4)*BRAZIL_09(-1) + B(1,5)*MEX_05(-1) + B(1,6)*MEX_07(-1) + B(1,7)*URUG_03(-1) + B(1,8)*URUG_08(-1) + B(1,9)*VENE_07(-1) + B(1,10)*VENE_18(-1) + B(1,11)*(@TREND(1)) + B(1,12)) + A(1,2)*(B(2,1)*ARGE_09(-1) + B(2,2)*ARGE_FRB(-1) + B(2,3)*BRAZIL_04(-1) + B(2,4)*BRAZIL_09(-1) + B(2,5)*MEX_05(-1) + B(2,6)*MEX_07(-1) + B(2,7)*URUG_03(-1) + B(2,8)*URUG_08(-1) + B(2,9)*VENE_07(-1) + B(2,10)*VENE_18(-1) + B(2,11)*(@TREND(1)) + B(2,12)) + C(1,1)*D(ARGE_09(-1)) + C(1,2)*D(ARGE_FRB(-1)) + C(1,3)*D(BRAZIL_04(-1)) + C(1,4)*D(BRAZIL_09(-1)) + C(1,5)*D(MEX_05(-1)) + C(1,6)*D(MEX_07(-1)) + C(1,7)*D(URUG_03(-1)) + C(1,8)*D(URUG_08(-1)) + C(1,9)*D(VENE_07(-1)) + C(1,10)*D(VENE_18(-1)) + C(1,11)

In terms of our model, the null hypothesis of short-run noncausality from Brazil_04 risk premium to Arge_09 risk premium is stated as C(1,3)=0. Similarly, the null hypothesis of short-run noncausality from Mex_07 risk premium to Arge_09 risk premium is stated by setting C(1,6)=0. The null hypothesis for long-run noncausality is stated by setting coefficients, A(1,1)=0 or A(1,2)=0.[43]

A test for the overall Granger causality that combines the two sources of causality was also constructed.[44] If the coefficients of the error correction term and the coefficients of the lagged differences of a right-hand-side variable are jointly

[43] In the system of equations at least one of the A(i,j) coefficients must be significantly different than zero to support long-run causality.

[44] Since this test considers both sources of causality, it is only reported by some authors testing for Granger causality, especially when these authors are not interested in the long- and short-run impacts of the variables.

significant, Granger causality is established. The appropriate test is an $F(Wald) - test$.

For example if we have the VEC Model:

D(ARGE_09) = A(1,1)*(B(1,1)*ARGE_09(-1) + B(1,2)*ARGE_FRB(-1) + B(1,3)*BRAZIL_04(-1) + B(1,4)*BRAZIL_09(-1) + B(1,5)*MEX_05(-1) + B(1,6)*MEX_07(-1) + B(1,7)*URUG_03(-1) + B(1,8)*URUG_08(-1) + B(1,9)*VENE_07(-1) + B(1,10)*VENE_18(-1) + B(1,11)*(@TREND(1)) + B(1,12)) + A(1,2)*(B(2,1)*ARGE_09(-1) + B(2,2)*ARGE_FRB(-1) + B(2,3)*BRAZIL_04(-1) + B(2,4)*BRAZIL_09(-1) + B(2,5)*MEX_05(-1) + B(2,6)*MEX_07(-1) + B(2,7)*URUG_03(-1) + B(2,8)*URUG_08(-1) + B(2,9)*VENE_07(-1) + B(2,10)*VENE_18(-1) + B(2,11)*(@TREND(1)) + B(2,12)) + C(1,1)*D(ARGE_09(-1)) + C(1,2)*D(ARGE_FRB(-1)) + C(1,3)*D(BRAZIL_04(-1)) + C(1,4)*D(BRAZIL_09(-1)) + C(1,5)*D(MEX_05(-1)) + C(1,6)*D(MEX_07(-1)) + C(1,7)*D(URUG_03(-1)) + C(1,8)*D(URUG_08(-1)) + C(1,9)*D(VENE_07(-1)) + C(1,10)*D(VENE_18(-1)) + C(1,11)

The null hypothesis of overall noncausality from Brazil_04 risk premium to Arge_09 risk premium is stated as C(1,3)= A(1,j)=0.

II. The Estimated VEC Model and Causality Test Results

Two causality tests are reported. The first test is a t-test on the coefficient of the error correction term Z_{t-1} (this is a test for long-run noncausality). The second test is a $F - test$ for short-run noncausality.[45]

[45] In some cases, in our model, this turns out to be a t-test as well.

From the estimated VEC model in $Table-5$ [46] for the Latin American data, one observes that the lagged error term Z_{t-1} from equation (7) is significant in the Arge_09, Arge_frb, Mex_07, Vene_07 and Vene_18 equations. This finding alone implies long –run causality from the right-hand-side variables to the left-hand-side variables.

From the estimated VEC model in $Table-5$ [47] for the East Asian data, one observes that the lagged error term Z_{t-1} from equation (7) is significant in the Kdb_72506, Kor_08, and Phil_pdi equations. (This finding alone implies long –run causality from the right-hand-side variables to the left-hand-side variables.)

From the estimated VEC model in $Table-5$ [48] for the East European data, one observes that the lagged error term Z_{t-1} from equation (7) is significant in the Pol_04, Pol_17, Rus_03, Rus_07 and Rus_10 equations. (This finding alone implies long –run causality from the right-hand-side variables to the left-hand-side variables.)

From the estimated VEC model in $Table-5$ [49] for the African data, one observes that the lagged error term Z_{t-1} from equation (7) is significant in the Israel_10, Israel_10, SOAF_06 and SOAF_09 equations. (This finding alone implies long –run causality from the right-hand-side variables to the left-hand-side variables.)

The short- run dynamic interactions among the variables are investigated and summarized in $Table-6$.[50] The table reports the $F-statistics$ (significance levels only) constructed under the null hypothesis of non-causality. For a particular variable, rejection of the null hypothesis implies that this variable Granger –causes the dependent variable.

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[46] see Table 5.1.2A and Table 5.1.2B

[47] see Table 5.2.2

[48] see Table 5.3.2A and Table 5.3.2B

[49] see Table 5.4.2

[50] The short-run results on the direction of causation is based on a 1 day lag for Latin American, 2 days for East Asia, 1 day for East Europe, and 1 day for Africa.

The results from *Table* – 6.1 that represent Latin America indicate that Brazil_04 and Brazil_09 Granger-cause all variables (Arge_09, Mex_05, Mex_07, URUG_03, URUG_08, Vene_07 and Vene_18) except Arge_FRB. Mex_05 Granger- cause all variables except Argentina's variables (Arge_FRB and Arge_09).[51]

The Granger– causality listed above are unidirectional except between Brazil_04 ↔ Brazil_09, Brazil_04 ↔ Mex_05 and Brazil_09 ↔ Mex_05 that we have bi-directional causality.[52]

The results from *Table* – 6.2 that represent East Asia indicate that in the short-run dynamics, Phil_10 Granger-causes all variables in East Asia (Phil_PDI, Kor_08 and KDB_72506). Phil_PDI Granger-causes Phil_10, Kor_08 Granger-causes Phil_PDI and KDB_72506, and KDB_72506 Granger-cause Phil_PDI.

The Granger– causality listed above are unidirectional except between Phil_10 ↔ Phil_PDI and Phil_PDI ↔ Kor_08 where we have bi-directional causality.

The results from *Table* – 6.3 that represent East Europe indicate that Russia's bonds influence the Polish and Bulgaria bond markets. Inside Russia's bond market we have bi-directional causality between its products[53]. Inside Bulgaria's market we see bi-directional causality between its bond products, and at the same time we see bi-directional causality with in products from Russia.[54]

From the above and from the estimated VEC model in *Table* – 5 for the Africa data, we saw that there exists long–run causality from the right-hand-side variables to the left-hand-side variables in Israel_10, Israel_10, SOAF_06 and SOAF_09 equations but in the short-run, our results from *Table* – 6.4 saw only SOAF_09 Granger-cause SOAF_06.

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[51] These results are at the one and five percent level of significance.

[52] The notation ↔ indicates bi-directional causality.

[53] Rus_03 ↔ Rus_07 and Rus_10 ↔ Rus_07

[54]Bulgaria_IAB11 ↔ Bulgaria_FLI12 ,Bulgaria_IAB11 ↔ Rus_07 and Bulgaria_FLI12 ↔ Rus_07

The long-run and short- run dynamics among the variables are summarized in *Table* – 7 [55]. The table reports the $F - statistics$ constructed under the null hypothesis of non-causality in the short-run. For a particular right-hand side variable, rejection of the null hypothesis implies that this variable Granger –causes the dependent variable. For the long-run (this is a test of long-run noncausality) the *Table* – 7 presents a $t - test$ (reports the $t - statistics$)[56] on the coefficient of the error correction term Z_{t-1} for each dependent variable that I have in each equation.

For every variable in the system and for every region, at least one channel of Granger causality is active: either in the short-run through the joint tests of lagged-differences or a statistically significant error correction term (ECT).

In *Table* – 7.1 and *Table* – 7.3, that represent the two regions where I have the most countries (Latin America and East Europe respectively) we see very clearly that the largest economies exert causal influence on other economies in their regions.

The Granger Causality tests shown in *Table* – 7.1 support that in Latin America the risk premium movements of Brazil, the largest economy[57] exert the strongest causal influence on all of the economies[58] (lagged coefficients significant at 0.01 and 0.05) with the exception of Arge_FRB (Argentina's Federal Reserve Bank bonds). In Mexico, the second largest economy, we see that the risk premium of Mex_05 exert causal influence on all of the economies (lagged coefficients significant at 0.01 and 0.05) with the exception of all of Argentina's products. The risk premium of Mex_07

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[55] Table 7.1 for Latin America, Table 7.2 for East Asia, Table 7.3 for East Europe and Table 7.4 for Africa.

[56] According to Sims, Stock, and Watson (1990), the test t-ratio of the coefficient of the error correction term follows an asymptotic standard normal distribution.

[57] The two largest economies are Brazil and Mexico. The Brazilian economy represents roughly one-third of the output of the developing economies in the Western Hemisphere.

[58] Both Brazil's products exert the strongest causal influence on all of the economies in the Latin America.

also exerts causal influence on all of the economies (lagged coefficients significant at 0.01 and 0.05) with the exception of Argentina's and Brazil's products. At the same time we see bi-directional causality relationships among Brazil's products and Mexico's products.

Overall, the regional dominance of Brazil and Mexico in Latin America is confirmed by the causality test results.

The Granger Causality tests shown in *Table* – 7.3 support that in East Europe the risk premium movements of Russia exert the strongest causal influence on all of the other economies in the region. Russia's risk premiums for bonds influence the Polish and Bulgarian risk premium bond markets.

4.5 Impulse Response Functions: (Impulse Response Analysis)

To obtain additional insights into the short-run transmission mechanisms between risk premiums, impulse response functions (IRFs) are computed. The impulse response functions, show the effect of a unit shock applied separately to the error of each equation of the VEC. The study employs Choleski decomposition to produce the orthogonal residuals necessary to compute IRFs[59]. The Choleski decomposition requires that variables in the VAR be ordered in a particular fashion. Specifically, in the presence of cross-equation residual correlation, a change in the higher ordered variable will result in a corresponding change in all lower-ordered variables. The extent of the response among the lower-ordered variables depends on the degree of the residual correlation.

Impulse response analysis has been widely used in the applied VAR literature. It is, however, not straightforward to compute the impulse response from VECMs. The reduced-form VECM is usually converted to a levels VAR model for impulse response analysis.[60] Noting that the presence of unit roots prevents the inversion of a level VAR model to a moving average (MA) representation, Lutkepohl and Reimers (1992) a suggested specific algorithm to get impulse responses recursively in a cointegrated system.

Impulse responses are calculated for the estimated VEC and are given in *Figure* – 7. The impulse response function traces the effect and persistence of one product's shock to other products in the same region over a 20-day trading day horizon, which

[59] It must be noted that the Choleski decomposition is not without any shortcomings (see Wheeler, 1999). A major criticism of the Choleski decomposition is that it places a recursive structure on contemporaneous relationships.

[60] Mellander, Vredin, and Warne (1992) provide an algorithm to compute impulse response without converting VECM to levels VAR following the scheme in Campbell and Shiller (1988) and Warne (1991).

is an indication of how fast information transmits across markets[61]. In each *Figure* – 7 we see the effect of a unit shock applied separately to the error of each equation of the VEC, as that shocks works through the system, almost always very works quickly and in few only works very slow for the 20 day periods IRFs.

To obtain additional insights into the dynamic pattern and transmission mechanism of bond market linkages we examine separately each region. The impulse response function in *Figure* – 7 represents the Granger Causality from *Table* – 6 .

Figure – 7.1 presents the impulse responses for Latin American bond markets to a typical one standard deviation shock in Brazil's risk premium government bonds (brazil_04, brazil_09) and Mexico's risk premium government bonds (mex_05 and mex_07). Upon examination of *Figure* – 7.1 that represent the Latin American impulse responses, we see that most responses occur on day 0 to day two, and that these responses are positive. From day 0 to day 4 we see some fluctuation in this positive level, where after ward the responses are more smooth. In some cases the risk premium continues to increase slowly and in others it diminishes thereafter, while still remaining positive after the shock.[62]

Figure – 7.2 presents the impulse responses for east Asian bond markets to a typical one standard deviation shock in the Philippine risk premium government bonds (phil_10 and phil_pdi) and Korea's risk premium government bonds (kdb_72506 and kor_08). Upon examination of *Figure* – 7.2 that represent the Asian impulse responses, we see that most responses occur on day 0 to day two and that these responses are positive. From day 0 to day 6 we see some fluctuation in this positive level, where after ward the responses are more smooth. In some cases the risk premium continues to increase slowly and in others it diminishes thereafter, while still remaining positive after the shock.

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[61] In the future we can explore the research and see how the markets in each group would react to shocks in world financial markets.

[62] The only exemption is the response of Urug_03 to Mex_07

Figure – 7.3 presents the impulse responses for East European bond markets to a typical one standard deviation shock in Russia's risk premium government bonds (Rus_03, Rus_07 and Rus_10). Upon examination of *Figure* – 7.3 that represent the East Europe impulse responses, we see that most responses occur on day 0 to day two and these responses are positive. From day 0 to day 4 we see some fluctuation in this positive level, where after ward the responses are more smooth. In some cases the risk premium continues to increase slowly and in others it diminishes thereafter, while still remaining positive after the shock.[63]

Figure – 7.4 presents the impulse responses for African bond markets to a typical one standard deviation shock in South Africa's risk premium government bonds (Soaf_09). Upon examination of Figure 7.4 that represents the African impulse responses, we see that the response of Soaf_06 to Soaf_09 is positive. We see the risk premium continue to increase slowly and smoothly diminishes away.

In summary, the results from the impulse response functions support the presence of a positive significant dynamic relationship between different risk premiums. The increase of the risk premium[64] in a specific product effects the risk premium in another product within the same region.

[63] The only exemption is the response of Rus_03 to Rus_07

[64] Because of the effect of a shock (such as new information)

Chapter 5

5. Conclusion

In this thesis we investigated the long-run relationships among risk premiums for long-run government bonds of seventeen countries from four regions[65], using the risk premium to learn about any potential long-run relationships among these variables (the risk spread).

The degree of integration among different economies is an important issue in international finance. The existence of linkages across different national bond risk spreads has important implications for investors who are seeking for diversification of international opportunities. When such linkages suggest co-movements among different markets, any one market would be a representation of the behavior of that group of markets, and this would effectively amount to a reduced scope of possibilities for portfolio diversification.

In this study we looked specifically for patterns in the government bonds market inter-relationships over time for different regions. We focused especially on the risk premium that these governments bonds had over time and the inter-relationships among them. Cointegration is a necessary condition for co-movement in the long-run, and to test for this we used Johansen's multivariate cointegration analysis. These tests indicated a stationary long-run relationship among the risk premiums in each region separately, with estimates completed of these long-run equilibriums.

In this thesis analyses were completed to:

(i) Determine the long-run relationship among the risk premiums (risk spread);

(ii) Test for Granger-causality between the risk premiums;

(iii) Quantify the causality patterns by estimating an error-correction model and subsequently calculating impulse responses.

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[65] The four regions are East Europe, East Asia, Africa and Latin America

The results from the risk premiums time series can be summarized as follows:

First, after investigating the relationship among countries in each region, and by applying the cointegration test, the results indicated that there is a strong long-run relationship among the risk premiums for each region. The risk premiums in each region were cointegrated. At the same time we can apply the cointegration method to test the theory of Market Efficiency in the bonds market for these four different regions. The absence of cointegration (absence of a long-run equilibrium) suggests that the government bonds market is consistent with the Efficient Market Hypothesis. The results suggested that the emerging bond markets in each region I investigate have inefficient and predictable markets (it is possible to forecast the risk premium /risk spread).

Second, after establishing that the countries as a group in the Bonds markets, were cointegrated (i.e., there existed a long-run relationship among these countries in each group), we next employed a Vector Error Correction Model (VECM) to tie the short-run behavior of each series to its long-run values. In general, from the VECM the coefficients that represented the speed-of-adjustment parameters[66] were higher in East Europe than the other three regions of Latin America, Africa and East Asia, and because of this the values adjusted relatively faster to changes in the equilibrium relationship.

If we observe the graphs of the different cointegrating vectors, there appears to be a fairly regular cyclical component[67] that may be related to the business cycle. Some

[66] Since the speed-of-adjustment parameters are small in value the values adjust relatively slowly to changes to the equilibrium relationship.

[67] This regular cyclical component could be related to the business cycle and the uncertainty in the market. The risk premiums long-run relationship must show a steady rise during and shortly after the recessions. Also, as the bond market goes into the boom period the cointegrating relationship must fall in value.

future research could investigate these cyclical components with the movement of the business cycle.

When comparing the cointegrating vectors in different regions that capture the long-run stationary relationship among the risk premiums, we saw that the East Asian market has less fluctuation compared with the fluctuation in the Eastern Europe and Latin American markets. The Eastern Europe and Latin American markets were more volatile, with the highest fluctuation being in the Latin American market.

After we estimated the Vector Error Correction Model (VECM) the next step was to test for causality. With the causality test performed, we determined the influence of each risk premium on others. Understanding the movement of risk premiums can help us in investment decision-making and provide the forecasting tools to predict the future movement of risk premiums. To examine the short-run dynamics of the series we performed Granger causality tests and found that risk premium shocks are transmitted from large countries, with large economies to smaller economies. For the overall period of study, Brazil, Mexico and Russia, played an influential role in their regions.

To obtain additional insights into the short-run transmission mechanisms between risk premiums, impulse response functions were computed. The impulse response functions (IRFs), showed the effect of a unit shock applied separately to the error of each equation of the VEC, and that shocks almost always worked through the system very quickly for the 20-day period IRFs. We saw that the sharpest and most volatile responses occurred between day zero and day two, and these responses were positive.

Future research could investigate how markets for risk premiums of government bonds would react from region to region, or country to country to shock in the world financial markets.

TABLE 1: Augmented Dickey-Fuller Test

Table 1.1:Panel A

Credit Risk Latin America	ADF Test Statistic	Critical Value 5%	Critical Value 10%
Arge_FRB	-1.291509	-3.415819	-3.130170
Arge_09	-1.4866	-3.4158	-3.13017
Mex_05	-2.823692	-3.416053	-3.130308
Mex_07	-2.833570	-3.415811	-3.130165
URUG_03	0.011029	-3.416391	-3.130508
URUG_08	-0.294044	-3.416053	3.130308
PAN_08	-3.419351 **	-3.415811	-3.130165
PAN29P06	-3.663467 **	-3.415819	-3.130170
Vene_07	-1.773038	-3.416177	-3.130381
Vene_18	-2.535574	-3.416177	-3.130381
Brazil_04	-1.74999	-2.865204	-2.5687
Brazil_09	-2.919193	-3.416822	-3.130764

Note: ** denotes signicance at 5% level, * at 10% level, MacKinnon critical values for rejection of hypothesis of a unit root.

Table 1.2: Panel B

Credit Risk East Asia	ADF Test Statistic	Critical Value 5%	Critical Value 10%
China_04	-3.216776 **	-2.865682	-2.569033
Phil_10	-1.660608	-3.418944	-3.132019
Phil_PDI	-1.856523	-3.415868	-3.130199
Thai_07	-3.401593 *	-3.416440	-3.130537
Kor_08	-1.891415	-3.415844	-3.130184
KDB_72506	-2.358842	-3.416195	-3.130392

Note: ** denotes signicance at 5% level, * at 10% level, MacKinnon critical values for rejection of hypothesis of a unit root.

TABLE 1: Augmented Dickey-Fuller Test

Table 1.3: Panel C

Credit Risk East Europe	ADF Test Statistic	Critical Value 5%	Critical Value 10%
Rus_03	-1.603612	-3.416231	-3.130414
Rus_07	-1.837701	-3.416204	-3.130397
Rus_10	-1.366736	-3.418274	-3.131623
Pol_04	-2.763855	-3.417203	-3.130989
Pol_17	-2.187248	-3.418148	-3.131548
Pol_PBS_09	-2.632973	-3.417252	-3.131018
Hung_06	-0.566824	-3.422150	-3.133914
Bulgaria_IAB11	-1.322757	-3.415852	-3.130189
Bulgaria_FLI12	-1.359712	-3.415852	-3.130189

Note: ** denotes signicance at 5% level, * at 10% level, MacKinnon critical values for rejection of hypothesis of a unit root.

Table 1.4: Panel D

Credit Risk Africa	ADF Test Statistic	Critical Value 5%	Critical Value 10%
Israel_10	-2.544543	-2.866847	-2.569657
IsraelE_06	-2.091323	-3.417002	-3.130870
SOAF_06	-1.805296	-3.416833	-3.130770
SOAF_09	-1.692377	-3.416672	-3.130675
SOAF_17	-3.315284 *	-3.416159	-3.130371
Egypt_06	-2.851166	-3.432226	-3.139858
Egypt_11	-2.894841	-3.433156	-3.140406

Note: ** denotes signicance at 5% level, * at 10% level, MacKinnon critical values for rejection of hypothesis of a unit root.

TABLE 2: Augmented Dickey-Fuller Tests on the first differenced series

Table 2.1: Panel A

ADF tests on the first difference			
Credit Risk Latin America	ADF Test Statistic	Critical Value 5%	Critical Value 10%
Arge_FRB	-13.63525	-3.415819	-3.130170
Arge_09	-26.76825	-3.4158	-3.13016
Mex_05	-26.97153	-3.416053	-3.130308
Mex_07	-27.69998	-3.415811	-3.130165
URUG_03	-13.98064	-3.416391	-3.130508
URUG_08	-28.19483	-3.416053	3.130308
PAN_08	-26.48203	-3.415811	-3.130165
PAN29P06	-28.10727	-3.415819	-3.130170
Vene_07	-23.22000	-3.416177	-3.130381
Vene_18	-17.11184	-3.416177	-3.130381
Brazil_04	-17.29721	-2.865204	-2.5687
Brazil_09	-10.10750	-3.416822	-3.130764

Note: ** denotes signicance at 5% level, * at 10% level, MacKinnon critical values for rejection of hypothesis of a unit root.

Table 2.2: Panel B

ADF tests on the first difference			
Credit Risk East Asia	ADF Test Statistic	Critical Value 5%	Critical Value 10%
China_04	-4.816976	-2.865682	-2.569033
Phil_10	-7.813098	-3.418944	-3.132019
Phil_PDI	-13.41828	-3.415868	-3.130199
Thai_07	-12.42595	-3.416440	-3.130537
Kor_08	-16.99494	-3.415844	-3.130184
KDB_72506	-24.80448	-3.416195	-3.130392

Note: ** denotes signicance at 5% level, * at 10% level, MacKinnon critical values for rejection of hypothesis of a unit root.

TABLE 2: Augmented Dickey-Fuller Tests on the first differenced series

Table 2.3: Panel C

ADF tests on the first difference			
Credit Risk East Europe	ADF Test Statistic	Critical Value 5%	Critical Value 10%
Rus_03	-25.58019	-3.416231	-3.130414
Rus_07	-24.56769	-3.416204	-3.130397
Rus_10	-20.89388	-3.418274	-3.131623
Pol_04	-9.284586	-3.417203	-3.130989
Pol_17	-7.385698	-3.418148	-3.131548
Pol_PBS_09	-22.66035	-3.417252	-3.131018
Hung_06	-5.985160	-3.422150	-3.133914
Bulgaria_IAB11	-27.37206	-3.415852	-3.130189
Bulgaria_FLI12	-26.35124	-3.415852	-3.130189

Note: ** denotes signicance at 5% level, * at 10% level, MacKinnon critical values for rejection of hypothesis of a unit root.

Table 2.4: Panel D

ADF tests on the first difference			
Credit Risk Africa	ADF Test Statistic	Critical Value 5%	Critical Value 10%
Israel_10	-16.03713	-2.866847	-2.569657
IsraelE_06	-6.495392	-3.417002	-3.130870
SOAF_06	-12.14615	-3.416833	-3.130770
SOAF_09	-10.64453	-3.416672	-3.130675
SOAF_17	-26.48365	-3.416159	-3.130371
Egypt_06	-5.954471	-3.432226	-3.139858
Egypt_11	-5.620009	-3.433156	-3.140406

Note: ** denotes signicance at 5% level, * at 10% level, MacKinnon critical values for rejection of hypothesis of a unit root.

Table 3: Johansen Cointegration Test

Table 3.1: Johansen Cointegration Test Results for Latin America

Panel A-1

	Arge_FRB and Arge_09	Mex_05 and Mex_07	URUG_03 And URUG_08	Vene_07 And Vene_18	Brazil_04 And Brazil_09
Arge_FRB and Arge_09		**	**	NO	*
Mex_05 and Mex_07	**		**	**	*
URUG_03 And URUG_08	**	**		**	NO
Vene_07 And Vene_18	NO	**	**		**
Brazil_04 And Brazil_09	*	*	NO	**	

Note: * (**) denote accept ion of the hypothesis of Cointegration at the 5% (1%) level.
The critical values are taken from Osterward-Lenum (1992).

Table 3: Johansen Cointegration Test

Table 3.1: Johansen Cointegration Test Results for Latin America

Panel A-2

Arge_FRB and Arge_09,	**
Mex_05 and Mex_07	**
URUG_03 and URUG_08	*
Vene_07 and Vene_18	*
Brazil_04 and Brazil_09	NO
Arge_FRB, Arge_09, Brazil_04, Brazil_09, Mex_05 and Mex_07	*
Arge_FRB, Arge_09, Brazil_04, Brazil_09, URUG_03 and URUG_08	*
Arge_FRB, Arge_09, Brazil_04, Brazil_09, Vene_07 and Vene_18	*
Arge_FRB, Arge_09, Brazil_04, Brazil_09, Mex_05 and Mex_07, URUG_03 and URUG_08	*
Arge_FRB, Arge_09, Brazil_04, Brazil_09, Mex_05 and Mex_07, Vene_07 and Vene_18	*
Arge_FRB, Arge_09, Brazil_04, Brazil_09, Mex_05 and Mex_07, URUG_03, URUG_08, Vene_07 and Vene_18	* 2coin

Note: * (**) denote accept ion of the hypothesis of Cointegration at the 5% (1%) level. The critical values are taken from Osterward-Lenum (1992).

Table 3: Johansen Cointegration Test

Table 3.2: Johansen Cointegration Test Results for Asia

Panel B-1

	Phil_10	Phil_PDI	Kor_08	KDB_72506
Phil_10			**	**
Phil_PDI			**	
Kor_08	**	**		**
KDB_72506	**		**	

Note: * (**) denote accept ion of the hypothesis of Cointegration at the 5% (1%) level.
The critical values are taken from Osterward-Lenum (1992).

Table 3.2: Johansen Cointegration Test Results for Asia

Panel B-2

Phil_10, Kor_08 and KDB_72506	** 2coi
Phil_PDI, Kor_08 and KDB_72506	**
Phil_10, Phil_PDI and Kor_08	**
Phil_10, Phil_PDI, and KDB_72506	**
Phil_10, Phil_PDI, Kor_08 and KDB_72506	** 2coi

Note: * (**) denote accept ion of the hypothesis of Cointegration at the 5% (1%) level.
The critical values are taken from Osterward-Lenum (1992).

Table 3: Johansen Cointegration Test

Table 3.3: Johansen Cointegration Test Results for East Europe

Panel C-1

	Rus_03	Rus_07	Rus_10	Pol_04	Pol_17	Pol_PBS_09
Rus_03		*		**	*	*
Rus_07	*		**	**	**	
Rus_10		**		**	*	
Pol_04	**	**	**			*
Pol_17	*	**	*			
Pol_PBS_09	*			*		
Hung_06				**		
Bulgaria_IAB11		*	*	**		
Bulgaria_FLI12		*	**	**		

Note: * (**) denote accept ion of the hypothesis of Cointegration at the 5% (1%) level. The critical values are taken from Osterward-Lenum (1992).

Table 3.3: Johansen Cointegration Test Results for East Europe

Panel C-2

	Hung_06	Bulgaria_IAB11	Bulgaria_FLI12
Rus_03			
Rus_07		*	*
Rus_10		*	**
Pol_04	**	**	**
Pol_17			
Pol_PBS_09			
Hung_06			
Bulgaria_IAB11			
Bulgaria_FLI12			

Note: * (**) denote accept ion of the hypothesis of Cointegration at the 5% (1%) level. The critical values are taken from Osterward-Lenum (1992).

Table 3: Johansen Cointegration Test

Table 3.3: Johansen Cointegration Test Results for East Europe

Panel C-3

Rus_03, Rus_07, Rus_10, Pol_04, Pol_17 and Pol_PBS_09	* 2 coin
Rus_03, Rus_07, Rus_10, Pol_04, Pol_17, Pol_PBS_09 and Hung_06	no
Rus_03, Rus_07, Rus_10, Bulgaria_IAB11 and Bulgaria_FLI12	**
Rus_03, Rus_07, Rus_10, Bulgaria_IAB11, Bulgaria_FLI12 and Hung_06	*
Pol_04, Pol_17, Pol_PBS_09, Bulgaria_IAB11, Bulgaria_FLI12	** 2coin
Pol_04, Pol_17, Pol_PBS_09, Bulgaria_IAB11, Bulgaria_FLI12 and Hung_06	** 2coin
Hung_06, Pol_04, Pol_17, Pol_PBS_09	**
Hung_06, Bulgaria_IAB11, Bulgaria_FLI12	no
Hung_06, Rus_03, Rus_07, Rus_10	no
Rus_03, Rus_07, Rus_10, Pol_04, Pol_17, Pol_PBS_09, Bulgaria_IAB11 and Bulgaria_FLI12, Hung_06	** 2coin
Rus_03, Rus_07, Rus_10, Pol_04, Pol_17, Pol_PBS_09, Bulgaria_IAB11 and Bulgaria_FLI12	* 2coin

Note: * (**) denote accept ion of the hypothesis of Cointegration at the 5% (1%) level. The critical values are taken from Osterward-Lenum (1992).

Table 3: Johansen Cointegration Test

Table 3.4: Johansen Cointegration Test Results for Africa

Panel D-1

	Israel_10	IsraelE_06	SOAF_06	SOAF_09	Egypt_06	Egypt_11
Israel_10			*	**		*
IsraelE_06			**			
SOAF_06	*	**		**	*	
SOAF_09	**		**			
Egypt_06			*			*
Egypt_11	*				*	

Note: * (**) denote accept ion of the hypothesis of Cointegration at the 5% (1%) level. The critical values are taken from Osterward-Lenum (1992).

Table 3: Johansen Cointegration Test Results for Africa

Panel D-2

Israel_10, Egypt_06, Egypt_11	*
Israel_10, SOAF_06, SOAF_09	**
Israel_10, SOAF_06, SOAF_09, Egypt_06, Egypt_11	*
SOAF_06, SOAF_09, Egypt_06, Egypt_11	*
Israel_10, IsraelE_06, SOAF_06, SOAF_09	** 2coin

Note: * (**) denote accept ion of the hypothesis of Cointegration at the 5% (1%) level. The critical values are taken from Osterward-Lenum (1992).

Table 4: Multivariate Cointegration Test Results

Table 4.1: Multivariate Cointegration Test Results for Latin America
Series: Arge_FRB, Arge_09, Brazil_04, Brazil_09, Mex_05, Mex_07, URUG_03, URUG_08, Vene_07 and Vene_18

Sample(adjusted): 106 751
Included observations: 607
Excluded observations: 39 after adjusting endpoints
Trend assumption: Linear deterministic trend (restricted)
Lags interval (in first differences): 1 to 1

Unrestricted Cointegration Rank Test

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	5 Percent Critical Value	1 Percent Critical Value
None **	0.122542	305.2410	263.42	279.07
At most 1 *	0.089548	225.8903	222.21	234.41
At most 2	0.076818	168.9449	182.82	196.08
At most 3	0.046578	120.4281	146.76	158.49
At most 4	0.042019	91.47588	114.90	124.75
At most 5	0.036629	65.41930	87.31	96.58
At most 6	0.030171	42.76829	62.99	70.05
At most 7	0.017993	24.17267	42.44	48.45
At most 8	0.014129	13.15137	25.32	30.45
At most 9	0.007408	4.513629	12.25	16.26

*(**) denotes rejection of the hypothesis at the 5%(1%) level
Trace test indicates 2 cointegrating equation(s) at the 5% level
Trace test indicates 1 cointegrating equation(s) at the 1% level

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	5 Percent Critical Value	1 Percent Critical Value
None **	0.122542	79.35076	66.23	73.73
At most 1 *	0.089548	61.94537	61.29	67.88
At most 2	0.076818	48.51678	55.50	62.46
At most 3	0.046578	28.95226	49.42	54.71
At most 4	0.042019	26.05658	43.97	49.51
At most 5	0.036629	22.65102	37.52	42.36
At most 6	0.030171	18.59562	31.46	36.65
At most 7	0.017993	11.02131	25.54	30.34
At most 8	0.014129	8.637739	18.96	23.65
At most 9	0.007408	4.513629	12.25	16.26

*(**) denotes rejection of the hypothesis at the 5%(1%) level
Max-eigenvalue test indicates 1 cointegrating equation(s) at both 5% and 1% levels

Critical values are from Osterwald- Lenum (1992), p. 468, table 1.

Table 4: Multivariate Cointegration Test Results

Table 4.2: Multivariate Cointegration Test Results for East Asia

Series: Phil_10, Phil_PDI, Kor_08 and KDB_72506

Sample(adjusted): 207 751
Included observations: 516
Excluded observations: 29 after adjusting endpoints
Trend assumption: Linear deterministic trend (restricted)

Lags interval (in first differences): 1 to 2

Unrestricted Cointegration Rank Test

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	5 Percent Critical Value	1 Percent Critical Value
None **	0.093497	120.3534	62.99	70.05
At most 1 **	0.086661	69.30996	42.44	48.45
At most 2	0.024791	22.17317	25.32	30.45
At most 3	0.017384	9.119307	12.25	16.26

*(**) denotes rejection of the hypothesis at the 5%(1%) level
Trace test indicates 2 cointegrating equation(s) at both 5% and 1% levels

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	5 Percent Critical Value	1 Percent Critical Value
None **	0.093497	51.04348	31.46	36.65
At most 1 **	0.086661	47.13679	25.54	30.34
At most 2	0.024791	13.05386	18.96	23.65
At most 3	0.017384	9.119307	12.25	16.26

*(**) denotes rejection of the hypothesis at the 5%(1%) level
Max-eigenvalue test indicates 2 cointegrating equation(s) at both 5% and 1% levels

Critical values are from Osterwald- Lenum (1992), p. 468, table 1.

Table 4: Multivariate Cointegration Test Results

Table 4.3: Multivariate Cointegration Test Results for East Europe

Series: Rus_03, Rus_07, Rus_10, Pol_04, Pol_17, Pol_PBS_09, Bulgaria_IAB11 and Bulgaria_FLI12

Sample(adjusted): 192 751
Included observations: 507
Excluded observations: 53 after adjusting endpoints
Trend assumption: No deterministic trend (restricted constant)

Lags interval (in first differences): 1 to 1

Unrestricted Cointegration Rank Test

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	5 Percent Critical Value	1 Percent Critical Value
None **	0.136653	214.3125	165.58	177.20
At most 1 *	0.094175	139.8148	131.70	143.09
At most 2	0.050936	89.66789	102.14	111.01
At most 3	0.048417	63.16233	76.07	84.45
At most 4	0.031371	38.00090	53.12	60.16
At most 5	0.025850	21.84096	34.91	41.07
At most 6	0.010485	8.562425	19.96	24.60
At most 7	0.006328	3.218602	9.24	12.97

*(**) denotes rejection of the hypothesis at the 5%(1%) level
Trace test indicates 2 cointegrating equation(s) at the 5% level
Trace test indicates 1 cointegrating equation(s) at the 1% level

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	5 Percent Critical Value	1 Percent Critical Value
None **	0.136653	74.49770	52.00	57.95
At most 1 *	0.094175	50.14692	46.45	51.91
At most 2	0.050936	26.50556	40.30	46.82
At most 3	0.048417	25.16143	34.40	39.79
At most 4	0.031371	16.15994	28.14	33.24
At most 5	0.025850	13.27853	22.00	26.81
At most 6	0.010485	5.343823	15.67	20.20
At most 7	0.006328	3.218602	9.24	12.97

*(**) denotes rejection of the hypothesis at the 5%(1%) level
Max-eigenvalue test indicates 2 cointegrating equation(s) at the 5% level
Max-eigenvalue test indicates 1 cointegrating equation(s) at the 1% level

Critical values are from Osterwald- Lenum (1992), p. 468, table 1.

Table 4: Multivariate Cointegration Test Results

Table 4.4: Multivariate Cointegration Test Results for Africa

Series: Israel_10, Israel_06, SOAF_06 and SOAF_09

Sample(adjusted): 204 751
Included observations: 527
Excluded observations: 21 after adjusting endpoints
Trend assumption: Linear deterministic trend (restricted)

Lags interval (in first differences): 1 to 1

Unrestricted Cointegration Rank Test

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	5 Percent Critical Value	1 Percent Critical Value
None **	0.071675	89.94654	62.99	70.05
At most 1 **	0.050713	50.75184	42.44	48.45
At most 2	0.028986	23.32468	25.32	30.45
At most 3	0.014736	7.823449	12.25	16.26

*(**) denotes rejection of the hypothesis at the 5%(1%) level
Trace test indicates 2 cointegrating equation(s) at both 5% and 1% levels

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	5 Percent Critical Value	1 Percent Critical Value
None **	0.071675	39.19470	31.46	36.65
At most 1 **	0.050713	30.42716	25.54	30.34
At most 2	0.028986	15.50123	18.96	23.65
At most 3	0.014736	7.823449	12.25	16.26

*(**) denotes rejection of the hypothesis at the 5%(1%) level
Max-eigenvalue test indicates 2 cointegrating equation(s) at the 5% level
Max-eigenvalue test indicates 1 cointegrating equation(s) at the 1% level

Critical values are from Osterwald- Lenum (1992), p. 468, table 1.

Table 5: Vector Error Correction Estimates

Table 5.1.1: Cointegrating Equations for Latin America (Panel A)

Sample(adjusted): 106 751
Included observations: 607
Excluded observations: 39 after adjusting endpoints
Standard errors in ( ) & t-statistics in [ ]

Cointegrating Eq:	CointEq1	CointEq2
ARGE_09(-1)	1.000000	0.000000
ARGE_FRB(-1)	0.000000	1.000000
BRAZIL_04(-1)	-1.114452	-0.800533
	(1.28061)	(2.10568)
	[-0.87025]	[-0.38018]
BRAZIL_09(-1)	-0.249546	-0.587236
	(2.15009)	(3.53537)
	[-0.11606]	[-0.16610]
MEX_05(-1)	0.325984	-12.27707
	(1.71506)	(2.82005)
	[0.19007]	[-4.35349]
MEX_07(-1)	-1.070310	14.69363
	(2.14743)	(3.53098)
	[-0.49842]	[4.16135]
`URUG_03(-1)	0.120644	1.269681
	(0.30066)	(0.49437)
	[0.40126]	[2.56828]
URUG_08(-1)	1.201481	0.292717
	(0.57321)	(0.94252)
	[2.09606]	[0.31057]
VENE_07(-1)	-9.087132	-13.54911
	(1.25791)	(2.06836)
	[-7.22401]	[-6.55066]
VENE_18(-1)	15.86355	21.73895
	(2.20913)	(3.63244)
	[7.18091]	[5.98467]
@TREND(1)	-0.008976	-0.014544
	(0.00126)	(0.00208)
	[-7.10514]	[-7.00158]
C	-45.11537	-74.01582

Table 5: Vector Error Correction Estimates

Table 5.1.2A: Error Correction for Latin America (Panel A)

Error Correction:	Coefficients				
	D(ARGE_09)	D(ARGE_FRB)	D(BRAZIL_04)	D(BRAZIL_09)	D(MEX_05)
CointEq1	-0.011826 ** (0.00498) [-2.37591]	-0.021507 ** (0.01026) [-2.09561]	-0.005131 (0.00467) [-1.09990]	-0.001720 (0.00293) [-0.58754]	-0.005099 (0.00567) [-0.89970]
CointEq2	0.005607 ** (0.00274) [2.04352]	0.009652 * (0.00566) [1.70623]	-1.40E-05 (0.00257) [-0.00543]	-0.000893 (0.00161) [-0.55349]	0.003672 (0.00312) [1.17544]

Note: Asterisks indicate the significance with which the null hypothesis A=0 (or $\delta = 0$ from equation 7) can be rejected.
***= Significant at the 1% level
**= Significant at the 5% level
*= Significant at the 10% level

Table 5: Vector Error Correction Estimates

Table 5.1.2B: Error Correction for Latin America (Panel A)

Error Correction:	Coefficients				
	D(MEX_07)	D(URUG_03)	D(URUG_08)	D(VENE_07)	D(VENE_18)
CointEq1	0.010333 ** (0.00428) [2.41268]	0.003920 (0.01437) [0.27284]	-0.008860 (0.00558) [-1.58868]	0.005012 (0.00375) [1.33707]	-0.005528 ** (0.00230) [-2.40279]
CointEq2	-0.007205 *** (0.00236) [-3.05180]	-0.006833 (0.00792) [-0.86278]	0.004045 (0.00307) [1.31589]	0.004753 ** (0.00207) [2.30020]	0.001957 (0.00127) [1.54273]

Note: Asterisks indicate the significance with which the null hypothesis A=0 (or $\delta = 0$ from equation 7) can be rejected.
***= Significant at the 1% level
**= Significant at the 5% level
*= Significant at the 10% level

Table 5: Vector Error Correction Estimates

Table 5.2.1: Cointegrating Equations for East Asia (Panel B)

Sample(adjusted): 207 751
Included observations: 516
Excluded observations: 29 after adjusting endpoints
Standard errors in ( ) & t-statistics in [ ]

Cointegrating Eq:	CointEq1	CointEq2
KDB_72506(-1)	1.000000	0.000000
KOR_08(-1)	0.000000	1.000000
PHIL_10(-1)	-0.250478 (0.12059) [-2.07718]	-0.408576 (0.09306) [-4.39025]
PHIL_PDI(-1)	-0.616431 (0.12776) [-4.82481]	-0.414377 (0.09860) [-4.20247]
@TREND(1)	0.001264 (9.0E-05) [14.1159]	0.001272 (6.9E-05) [18.3936]
C	-0.333172	-0.559758

Table 5: Vector Error Correction Estimates

Table 5.2.2: Error Correction for East Asia (Panel B)

Error Correction:	Coefficients			
	D(KDB_72506)	D(KOR_08)	D(PHIL_10)	D(PHIL_PDI)
CointEq1	-0.168914 ***	0.008203	-0.020843	-0.009191
	(0.03412)	(0.03628)	(0.01878)	(0.03037)
	[-4.95024]	[0.22612]	[-1.10993]	[-0.30258]
CointEq2	0.048896	-0.173094 ***	0.024088	0.079585 **
	(0.04167)	(0.04430)	(0.02293)	(0.03709)
	[1.17351]	[-3.90748]	[1.05047]	[2.14567]

Note: Asterisks indicate the significance with which the null hypothesis A=0 (or $\delta = 0$ from equation 7) can be rejected.
***= Significant at the 1% level
**= Significant at the 5% level
*= Significant at the 10% level

Table 5: Vector Error Correction Estimates

Table 5.3.1: Cointegrating Equations for East Europe (Panel C)

Sample(adjusted): 192 751
Included observations: 507
Excluded observations: 53 after adjusting endpoints
Standard errors in ( ) & t-statistics in [ ]

Cointegrating Eq:	CointEq1	CointEq2
BULGARIA_FLI12(-1)	1.000000	0.000000
BULGARIA_IAB11(-1)	0.000000	1.000000
POL_04(-1)	2.871130 (0.38117) [7.53241]	3.536115 (0.45680) [7.74104]
POL_17(-1)	-0.682181 (0.50303) [-1.35614]	-0.429614 (0.60284) [-0.71265]
POL_PBS_09(-1)	-1.532940 (0.57659) [-2.65863]	-2.078832 (0.69100) [-3.00845]
RUS_03(-1)	0.597901 (0.74414) [0.80348]	0.683935 (0.89179) [0.76692]
RUS_07(-1)	-1.110583 (1.73972) [-0.63837]	-1.030952 (2.08491) [-0.49448]
RUS_10(-1)	-1.460260 (1.80693) [-0.80814]	-1.747227 (2.16546) [-0.80686]
C	5.246283 (4.06264) [1.29135]	4.658750 (4.86874) [0.95687]

Table 5: Vector Error Correction Estimates

Table 5.3.2A: Error Correction for East Europe (Panel C)

Error Correction:	Coefficients			
	D(BULGARIA_FLI12)	D(BULGARIA_IAB11)	D(POL_04)	D(POL_17)
CointEq1	-0.039179 (0.03765) [-1.04066]	0.018638 (0.03414) [0.54591]	0.530486 *** (0.16653) [3.18547]	0.400262 *** (0.07674) [5.21565]
CointEq2	0.031988 (0.03094) [1.03385]	-0.016484 (0.02806) [-0.58748]	-0.494189 *** (0.13686) [-3.61079]	-0.327643 *** (0.06307) [-5.19486]

Note: Asterisks indicate the significance with which the null hypothesis A=0 (or $\delta = 0$ from equation 7) can be rejected.
***= Significant at the 1% level
**= Significant at the 5% level
*= Significant at the 10% level

Table 5: Vector Error Correction Estimates

Table 5.3.2B: Error Correction for East Europe (Panel C)

Error Correction:	Coefficients			
	D(POL_PBS_09)	D(RUS_03)	D(RUS_07)	D(RUS_10)
CointEq1	-0.023789 (0.06339) [-0.37526]	0.102267 (0.05234) [1.95397]	0.097154 *** (0.03612) [2.68991]	0.070771 ** (0.03413) [2.07364]
CointEq2	0.026727 (0.05210) [0.51301]	-0.076694 * (0.04301) [-1.78301]	-0.075901 *** (0.02968) [-2.55701]	-0.056020 ** (0.02805) [-1.99723]

Note: Asterisks indicate the significance with which the null hypothesis A=0 (or $\delta = 0$ from equation 7) can be rejected.
***= Significant at the 1% level
**= Significant at the 5% level
*= Significant at the 10% level

Table 5: Vector Error Correction Estimates

Table 5.4.1: Cointegrating Equations for Africa (Panel D)

Sample(adjusted): 204 751
Included observations: 527
Excluded observations: 21 after adjusting endpoints
Standard errors in ( ) & t-statistics in [ ]

Cointegrating Eq:	CointEq1	CointEq2
ISRAEL_10(-1)	1.000000	0.000000
ISRAELE_06(-1)	0.000000	1.000000
SOAF_06(-1)	1.445034	-5.273047
	(0.84530)	(0.81089)
	[1.70950]	[-6.50281]
SOAF_09(-1)	0.937549	5.208236
	(1.01604)	(0.97468)
	[0.92274]	[5.34352]
@TREND(1)	0.002586	-0.000414
	(0.00057)	(0.00055)
	[4.53818]	[-0.75813]
C	-20.01750	-5.016189

Table 5: Vector Error Correction Estimates

Table 5.4.2: Error Correction for Africa (Panel D)

Error Correction:	Coefficients			
	D(ISRAEL_10)	D(ISRAELE_06)	D(SOAF_06)	D(SOAF_09)
CointEq1	-0.010441 (0.00379) [-2.75228]	-0.008144 (0.00505) [-1.61390]	-0.014461 (0.00562) [-2.57174]	-0.019402 (0.00394) [-4.92759]
CointEq2	-0.004168 (0.00334) [-1.24949]	-0.010921 (0.00444) [-2.46163]	0.023832 (0.00494) [4.82022]	-0.001998 (0.00346) [-0.57725]

Note: Asterisks indicate the significance with which the null hypothesis A=0 (or $\delta = 0$ from equation 7) can be rejected.
***= Significant at the 1% level
**= Significant at the 5% level
*= Significant at the 10% level

Table 6: Granger Causality Tests

Table 6.1.1: Granger Causality Test Results for Latin America
Series: Arge_FRB, Arge_09, Brazil_04, Brazil_09, Mex_05, Mex_07, URUG_03, URUG_08, Vene_07 and Vene_18

Pairwise Granger Causality Tests
Lags: 1

Null Hypothesis:	**Obs.**	**F-Statistic**	**Probability**
DARGE_FRB does not Granger Cause DARGE09 DARGE09 does not Granger Cause DARGE_FRB	749	4.10775 0.01520	0.04304 0.90190
DBRAZIL_04 does not Granger Cause DARGE09 DARGE09 does not Granger Cause DBRAZIL_04	747	6.00017 0.41190	0.01453 0.52120
DBRAZIL_09 does not Granger Cause DARGE09 DARGE09 does not Granger Cause DBRAZIL_09	646	3.59060 0.65509	0.05856 0.41860
DMEX_05 does not Granger Cause DARGE09 DARGE09 does not Granger Cause DMEX_05	717	1.27666 0.57785	0.25890 0.44741
DMEX_07 does not Granger Cause DARGE09 DARGE09 does not Granger Cause DMEX_07	750	1.03146 0.01464	0.31015 0.90374
DURUG_03 does not Granger Cause DARGE09 DARGE09 does not Granger Cause DURUG_03	708	0.12866 0.51471	0.71993 0.47335
DURUG_08 does not Granger Cause DARGE09 DARGE09 does not Granger Cause DURUG_08	717	0.51653 1.47553	0.47256 0.22488
DVENE_07 does not Granger Cause DARGE09 DARGE09 does not Granger Cause DVENE_07	714	0.85348 0.56268	0.35588 0.45343
DVENE_18 does not Granger Cause DARGE09 DARGE09 does not Granger Cause DVENE_18	718	0.85549 0.15054	0.35531 0.69813
DBRAZIL_04 does not Granger Cause DARGE_FRB DARGE_FRB does not Granger Cause DBRAZIL_04	746	1.00191 0.18540	0.31717 0.66690
DBRAZIL_09 does not Granger Cause DARGE_FRB DARGE_FRB does not Granger Cause DBRAZIL_09	646	0.23252 0.14411	0.62982 0.70435
DMEX_05 does not Granger Cause DARGE_FRB DARGE_FRB does not Granger Cause DMEX_05	717	0.14611 2.30011	0.70240 0.12981
DMEX_07 does not Granger Cause DARGE_FRB DARGE_FRB does not Granger Cause DMEX_07	749	0.05685 0.20906	0.81162 0.64764

Table 6: Granger Causality Tests

Table 6.1.2: Granger Causality Test Results for Latin America
Series: Arge_FRB, Arge_09, Brazil_04, Brazil_09, Mex_05, Mex_07, URUG_03, URUG_08, Vene_07 and Vene_18

Pairwise Granger Causality Tests
Lags: 1

Null Hypothesis:	Obs.	F-Statistic	Probability
DURUG_03 does not Granger Cause DARGE_FRB DARGE_FRB does not Granger Cause DURUG_03	707	0.14062 1.94462	0.70778 0.16361
DURUG_08 does not Granger Cause DARGE_FRB DARGE_FRB does not Granger Cause DURUG_08	717	2.00296 2.76259	0.15743 0.09693
DVENE_07 does not Granger Cause DARGE_FRB DARGE_FRB does not Granger Cause DVENE_07	714	0.04440 0.03189	0.83317 0.85832
DVENE_18 does not Granger Cause DARGE_FRB DARGE_FRB does not Granger Cause DVENE_18	717	0.23987 1.23739	0.62445 0.26635
DBRAZIL_09 does not Granger Cause DBRAZIL_04 DBRAZIL_04 does not Granger Cause DBRAZIL_09	643	3.62604 2.95180	0.05733 0.08627
DMEX_05 does not Granger Cause DBRAZIL_04 DBRAZIL_04 does not Granger Cause DMEX_05	714	4.93373 20.2875	0.02665 7.8E-06
DMEX_07 does not Granger Cause DBRAZIL_04 DBRAZIL_04 does not Granger Cause DMEX_07	747	1.96710 13.9452	0.16117 0.00020
DURUG_03 does not Granger Cause DBRAZIL_04 DBRAZIL_04 does not Granger Cause DURUG_03	705	2.20514 6.46954	0.13800 0.01119
DURUG_08 does not Granger Cause DBRAZIL_04 DBRAZIL_04 does not Granger Cause DURUG_08	714	0.75831 4.58594	0.38415 0.03257
DVENE_07 does not Granger Cause DBRAZIL_04 DBRAZIL_04 does not Granger Cause DVENE_07	711	0.77735 11.6420	0.37825 0.00068
DVENE_18 does not Granger Cause DBRAZIL_04 DBRAZIL_04 does not Granger Cause DVENE_18	715	1.96177 12.9677	0.16176 0.00034
DMEX_05 does not Granger Cause DBRAZIL_09 DBRAZIL_09 does not Granger Cause DMEX_05	623	5.09363 8.17086	0.02436 0.00440
DMEX_07 does not Granger Cause DBRAZIL_09 DBRAZIL_09 does not Granger Cause DMEX_07	646	0.46930 4.72246	0.49356 0.03014

Table 6: Granger Causality Tests

Table 6.1.3: Granger Causality Test Results for Latin America
Series: Arge_FRB, Arge_09, Brazil_04, Brazil_09, Mex_05, Mex_07, URUG_03, URUG_08, Vene_07 and Vene_18

Pairwise Granger Causality Tests
Lags: 1

Null Hypothesis:	**Obs.**	**F-Statistic**	**Probability**
DURUG_03 does not Granger Cause DBRAZIL_09 DBRAZIL_09 does not Granger Cause DURUG_03	613	0.35062 6.10222	0.55398 0.01377
DURUG_08 does not Granger Cause DBRAZIL_09 DBRAZIL_09 does not Granger Cause DURUG_08	623	0.04907 5.10354	0.82477 0.02422
DVENE_07 does not Granger Cause DBRAZIL_09 DBRAZIL_09 does not Granger Cause DVENE_07	620	1.40573 9.83938	0.23622 0.00179
DVENE_18 does not Granger Cause DBRAZIL_09 DBRAZIL_09 does not Granger Cause DVENE_18	623	0.52985 6.37733	0.46694 0.01181
DMEX_07 does not Granger Cause DMEX_05 DMEX_05 does not Granger Cause DMEX_07	717	5.86049 2.01123	0.01573 0.15657
DURUG_03 does not Granger Cause DMEX_05 DMEX_05 does not Granger Cause DURUG_03	707	2.51676 11.5039	0.11309 0.00073
DURUG_08 does not Granger Cause DMEX_05 DMEX_05 does not Granger Cause DURUG_08	717	1.76490 4.19391	0.18444 0.04093
DVENE_07 does not Granger Cause DMEX_05 DMEX_05 does not Granger Cause DVENE_07	714	0.42530 16.1664	0.51451 6.4E-05
DVENE_18 does not Granger Cause DMEX_05 DMEX_05 does not Granger Cause DVENE_18	717	0.95801 14.3510	0.32802 0.00016
DURUG_03 does not Granger Cause DMEX_07 DMEX_07 does not Granger Cause DURUG_03	708	2.96031 5.28089	0.08577 0.02185
DURUG_08 does not Granger Cause DMEX_07 DMEX_07 does not Granger Cause DURUG_08	717	1.86959 0.01398	0.17195 0.90592
DVENE_07 does not Granger Cause DMEX_07 DMEX_07 does not Granger Cause DVENE_07	714	2.64665 9.69259	0.10421 0.00192
DVENE_18 does not Granger Cause DMEX_07 DMEX_07 does not Granger Cause DVENE_18	718	0.06946 6.74556	0.79220 0.00959

Table 6: Granger Causality Tests

Table 6.1.4: Granger Causality Test Results for Latin America
Series: Arge_FRB, Arge_09, Brazil_04, Brazil_09, Mex_05, Mex_07, URUG_03, URUG_08, Vene_07 and Vene_18

Pairwise Granger Causality Tests
Lags: 1

Null Hypothesis:	**Obs.**	**F-Statistic**	**Probability**
DURUG_08 does not Granger Cause DURUG_03 DURUG_03 does not Granger Cause DURUG_08	707	0.00087 10.8202	0.97654 0.00105
DVENE_07 does not Granger Cause DURUG_03 DURUG_03 does not Granger Cause DVENE_07	704	4.33948 2.55245	0.03760 0.11057
DVENE_18 does not Granger Cause DURUG_03 DURUG_03 does not Granger Cause DVENE_18	708	1.22011 5.05887	0.26972 0.02481
DVENE_07 does not Granger Cause DURUG_08 DURUG_08 does not Granger Cause DVENE_07	714	1.27752 4.15659	0.25874 0.04184
DVENE_18 does not Granger Cause DURUG_08 DURUG_08 does not Granger Cause DVENE_18	717	0.30284 0.00689	0.58228 0.93385
DVENE_18 does not Granger Cause DVENE_07 DVENE_07 does not Granger Cause DVENE_18	714	4.21190 4.18700	0.04051 0.04110

Table 6.2: Granger Causality Tests

Table 6.2: Granger Causality Test Results for East Asia
Series: Phil_10, Phil_PDI, Kor_08 and KDB_72506

Pairwise Granger Causality Tests
Lags: 2

Null Hypothesis:	**Obs.**	**F-Statistic**	**Probability**
DKOR_08 does not Granger Cause DKDB_72506	706	3.42886	0.03297
DKDB_72506 does not Granger Cause DKOR_08		1.25583	0.28548
DPHIL_10 does not Granger Cause DKDB_72506	516	2.84394	0.05912
DKDB_72506 does not Granger Cause DPHIL_10		0.20960	0.81098
DPHIL_PDI does not Granger Cause DKDB_72506	706	1.58236	0.20622
DKDB_72506 does not Granger Cause DPHIL_PDI		3.98399	0.01903
DPHIL_10 does not Granger Cause DKOR_08	521	4.91596	0.00768
DKOR_08 does not Granger Cause DPHIL_10		0.15046	0.86035
DPHIL_PDI does not Granger Cause DKOR_08	748	3.28078	0.03814
DKOR_08 does not Granger Cause DPHIL_PDI		3.13435	0.04410
DPHIL_PDI does not Granger Cause DPHIL_10	520	3.46942	0.03186
DPHIL_10 does not Granger Cause DPHIL_PDI		2.88944	0.05651

Table 6: Granger Causality Tests

Table 6.3.1: Granger Causality Test Results for East Europe
Series: Rus_03, Rus_07, Rus_10, Pol_04, Pol_17, Pol_PBS_09, Bulgaria_IAB11 and Bulgaria_FLI12

Pairwise Granger Causality Tests
Lags: 1

Null Hypothesis:	**Obs.**	**F-Stat.**	**Prob.**
DBULGARIA_IAB11 does not Granger Cause DBULGARIA_FLI12 DBULGARIA_FLI12 does not Granger Cause DBULGARIA_IAB11	743	4.19008 5.68100	0.04101 0.01740
DPOL_04 does not Granger Cause DBULGARIA_FLI12 DBULGARIA_FLI12 does not Granger Cause DPOL_04	671	0.06729 0.05834	0.79540 0.80921
DPOL_17 does not Granger Cause DBULGARIA_FLI12 DBULGARIA_FLI12 does not Granger Cause DPOL_17	691	0.99009 0.00695	0.32007 0.93359
DPOL_PBS_09 does not Granger Cause DBULGARIA_FLI12 DBULGARIA_FLI12 does not Granger Cause DPOL_PBS_09	614	0.12969 0.00602	0.71888 0.93817
DRUS_03 does not Granger Cause DBULGARIA_FLI12 DBULGARIA_FLI12 does not Granger Cause DRUS_03	691	0.25191 1.29264	0.61589 0.25596
DRUS_07 does not Granger Cause DBULGARIA_FLI12 DBULGARIA_FLI12 does not Granger Cause DRUS_07	694	5.88470 4.11551	0.01553 0.04287
DRUS_10 does not Granger Cause DBULGARIA_FLI12 DBULGARIA_FLI12 does not Granger Cause DRUS_10	525	7.30731 0.97145	0.00709 0.32477
DPOL_04 does not Granger Cause DBULGARIA_IAB11 DBULGARIA_IAB11 does not Granger Cause DPOL_04	671	1.04249 0.01044	0.30761 0.91865
DPOL_17 does not Granger Cause DBULGARIA_IAB11 DBULGARIA_IAB11 does not Granger Cause DPOL_17	691	2.40142 0.23762	0.12168 0.62609
DPOL_PBS_09 does not Granger Cause DBULGARIA_IAB11 DBULGARIA_IAB11 does not Granger Cause DPOL_PBS_09	614	0.02072 0.00525	0.88559 0.94228
DRUS_03 does not Granger Cause DBULGARIA_IAB11 DBULGARIA_IAB11 does not Granger Cause DRUS_03	691	1.16971 2.16556	0.27984 0.14159
DRUS_07 does not Granger Cause DBULGARIA_IAB11 DBULGARIA_IAB11 does not Granger Cause DRUS_07	694	7.66846 5.47121	0.00577 0.01962

Table 6: Granger Causality Tests

Table 6.3.2: Granger Causality Test Results for East Europe
Series: Rus_03, Rus_07, Rus_10, Pol_04, Pol_17, Pol_PBS_09, Bulgaria_IAB11 and Bulgaria_FLI12

Pairwise Granger Causality Tests
Lags: 1

Null Hypothesis:	**Obs.**	**F-Statistic**	**Probability**
DRUS_10 does not Granger Cause DBULGARIA_IAB11	525	7.31646	0.00706
DBULGARIA_IAB11 does not Granger Cause DRUS_10		0.97600	0.32365
DPOL_17 does not Granger Cause DPOL_04	671	13.0958	0.00032
DPOL_04 does not Granger Cause DPOL_17		0.20816	0.64836
DPOL_PBS_09 does not Granger Cause DPOL_04	593	0.54332	0.46135
DPOL_04 does not Granger Cause DPOL_PBS_09		2.26615	0.13276
DRUS_03 does not Granger Cause DPOL_04	671	1.84495	0.17483
DPOL_04 does not Granger Cause DRUS_03		1.35877	0.24417
DRUS_07 does not Granger Cause DPOL_04	672	0.36346	0.54679
DPOL_04 does not Granger Cause DRUS_07		1.99495	0.15829
DRUS_10 does not Granger Cause DPOL_04	508	0.29897	0.58477
DPOL_04 does not Granger Cause DRUS_10		0.86301	0.35334
DPOL_PBS_09 does not Granger Cause DPOL_17	608	5.25704	0.02220
DPOL_17 does not Granger Cause DPOL_PBS_09		0.57222	0.44967
DRUS_03 does not Granger Cause DPOL_17	688	3.36697	0.06695
DPOL_17 does not Granger Cause DRUS_03		0.09505	0.75794
DRUS_07 does not Granger Cause DPOL_17	691	0.98871	0.32041
DPOL_17 does not Granger Cause DRUS_07		0.47949	0.48888
DRUS_10 does not Granger Cause DPOL_17	522	0.35255	0.55293
DPOL_17 does not Granger Cause DRUS_10		0.04606	0.83015
DRUS_03 does not Granger Cause DPOL_PBS_09	608	6.23982	0.01276
DPOL_PBS_09 does not Granger Cause DRUS_03		1.17739	0.27832

Table 6: Granger Causality Tests

Table 6.3.3: Granger Causality Test Results for East Europe
Series: Rus_03, Rus_07, Rus_10, Pol_04, Pol_17, Pol_PBS_09, Bulgaria_IAB11 and Bulgaria_FLI12

Pairwise Granger Causality Tests
Lags: 1

Null Hypothesis:	**Obs.**	**F-Statistic**	**Probability**
DRUS_07 does not Granger Cause DPOL_PBS_09	611	1.58424	0.20863
DPOL_PBS_09 does not Granger Cause DRUS_07		0.21018	0.64679
DRUS_10 does not Granger Cause DPOL_PBS_09	525	2.04379	0.15343
DPOL_PBS_09 does not Granger Cause DRUS_10		4.9E-05	0.99444
DRUS_07 does not Granger Cause DRUS_03	691	8.05145	0.00468
DRUS_03 does not Granger Cause DRUS_07		7.16010	0.00763
DRUS_10 does not Granger Cause DRUS_03	522	12.3700	0.00047
DRUS_03 does not Granger Cause DRUS_10		0.19789	0.65661
DRUS_10 does not Granger Cause DRUS_07	526	9.90847	0.00174
DRUS_07 does not Granger Cause DRUS_10		4.95020	0.02651

Table 6: Granger Causality Tests

Table 6.4: Granger Causality Test Results for Africa
Series: Israel_10, Israel_06, SOAF_06 and SOAF_09

Pairwise Granger Causality Tests
Lags: 1

Null Hypothesis:	**Obs.**	**F-Statistic**	**Probability**
DISRAELE_06 does not Granger Cause DISRAEL_10 DISRAEL_10 does not Granger Cause DISRAELE_06	528	0.45085 0.29965	0.50223 0.58433
DSOAF_06 does not Granger Cause DISRAEL_10 DISRAEL_10 does not Granger Cause DSOAF_06	530	0.27588 2.51751	0.59964 0.11319
DSOAF_09 does not Granger Cause DISRAEL_10 DISRAEL_10 does not Granger Cause DSOAF_09	531	1.15960 0.72463	0.28204 0.39502
DSOAF_06 does not Granger Cause DISRAELE_06 DISRAELE_06 does not Granger Cause DSOAF_06	698	1.11873 2.33675	0.29056 0.12681
DSOAF_09 does not Granger Cause DISRAELE_06 DISRAELE_06 does not Granger Cause DSOAF_09	699	0.18854 1.97392	0.66427 0.16048
DSOAF_09 does not Granger Cause DSOAF_06 DSOAF_06 does not Granger Cause DSOAF_09	701	7.16726 0.00199	0.00760 0.96440

Table 7: Granger Causality Tests

Table 7.1A: Multivariate Causality Test Results for Latin America

Series: Arge_FRB, Arge_09, Brazil_04, Brazil_09, Mex_05, Mex_07, URUG_03, URUG_08, Vene_07 and Vene_18

Dep.Variable (Lag lengths)	long-run (t-stat.)	Short run lagged differences (F-statistics)				
	Z_{t-1}	Arge_frb	Arge_09	Brazil_04	Brazil_09	Mex_05
Arge_fbr	-2.09561**		0.01520	1.00191	0.23252	0.14611
Arge_09	-2.3759***	4.10775**		6.00017**	3.59060*	1.27666
Brazil_04	-1.09990	0.18540	0.41190		↔ 3.62604*	↔ 4.93373**
Brazil_09	-0.58754	0.14411	0.65509	↔ 2.95180*		↔ 5.09363**
`Mex_05	-0.89970	2.30011	0.57785	↔ 20.2875***	↔ 8.17086***	
Mex_07	-3.0518***	0.20906	0.01464	13.9452***	4.72246**	2.01123
URUG_03	-0.86278	1.94462	0.51471	6.46954**	6.10222**	11.5039***
URUG_08	-1.58868	2.76259*	1.47553	4.58594**	5.10354**	4.19391**
Vene_07	2.30020**	0.85832	0.56268	11.6420***	9.83938***	16.1664***
Vene_18	-2.40279**	0.26635	0.15054	12.9677***	6.37733**	14.3510***

***, ** and * represent rejection of the hypotheses of non-causality at the 1%, 5% and 10% levels of significance. The results from this table are obtained by estimating the model that is presented in Equation 7 from chapter 3. The estimated Z_{t-1} represents the error-correction term lagged by one period. The optimal lag lengths are determined by the Akaike Information Criterion. All variables are in first differences except the error – correction term Z_{t-1}

Table 7: Granger Causality Tests

Table 7.1B: Multivariate Causality Test Results for Latin America

Series: Arge_FRB, Arge_09, Brazil_04, Brazil_09, Mex_05, Mex_07, URUG_03, URUG_08, Vene_07 and Vene_18

Dep.Variable (Lag lengths)	long-run (t-stat.)	Short run lagged differences (F-statistics)				
	Z_{t-1}	Mex_07	URUG_03	URUG_08	Vene_07	Vene_018
Arge_FRB	-2.09561**	0.05685	0.14062	2.00296	0.83317	0.62445
Arge_09	-2.3759***	1.03146	0.12866	0.51653	0.85348	0.85549
Brazil_04	-1.09990	0.16117	2.20514	0.75831	0.77735	1.96177
Brazil_09	-0.58754	0.46930	0.35062	0.04907	1.40573	0.52985
`Mex_05	-0.89970	5.86049**	2.51676	1.76490	0.42530	0.42530
Mex_07	-3.0518***		↔ 2.96031*	1.86959	2.64665	0.06946
URUG_03	-0.86278	↔ 5.28089**		0.00087	4.33948**	1.22011
URUG_08	-1.58868	0.01398	10.8202***		1.27752	0.30284
Vene_07	2.30020**	9.69259***	2.55245	4.15659**		↔ 4.21190**
Vene_18	-2.40279**	6.74556***	5.05887**	0.00689	↔ 4.18700**	

***, ** and * represent rejection of the hypotheses of non-causality at the 1%, 5% and 10% levels of significance. The results from this table are obtained by estimating the model that is presented in Equation 7 from chapter 3. The estimated Z_{t-1} represents the error-correction term lagged by one period. The optimal lag lengths are determined by the Akaike Information Criterion. All variables are in first differences except the error – correction term Z_{t-1}

Table 7: Granger Causality Tests

Table 7.2: Multivariate Causality Test Results for East Asia

Series: Phil_10, Phil_PDI, Kor_08 and KDB_72506

Dep.Variable (Lag lengths)	long-run (t-stat.)	Short run lagged differences (F-statistics)			
	Z_{t-1}	Phil_10	Phil_PDI	Kor_08	KDB_72506
Phil_10	-1.10993		↔ 3.46942**	0.15046	0.20960
Phil_PDI	2.14567 **	↔ 2.88944*		↔ 3.13435**	3.98399**
Kor_08	-3.90748 ***	4.91596***	↔ 3.28078**		1.25583
KDB_72506	-4.95024 ***	2.84394*	1.58236	3.42886**	

***, ** and * represent rejection of the hypotheses of non-causality at the 1%, 5% and 10% levels of significance. The results from this table are obtained by estimating the model that is presented in Equation 7 from chapter 3. The estimated Z_{t-1} represents the error-correction term lagged by one period. The optimal lag lengths are determined by the Akaike Information Criterion. All variables are in first differences except the error – correction term Z_{t-1}

Table 7: Granger Causality Tests

Table 7.3A: Multivariate Causality Test Results for East Europe

Series: Rus_03, Rus_07, Rus_10, Pol_04, Pol_17, Pol_PBS_09, Bulgaria_IAB11 and Bulgaria_FLI12

Dep.Variable (Lag lengths)	long-run (t-stat.)	Short run lagged differences (F-statistics)			
	Z_{t-1}	Rus_03	Rus_07	Rus_10	Pol_04
Rus_03	-1.78301 *		↔ 8.05145***	12.3700***	1.35877
Rus_07	-2.55701 **	↔ 7.16010**		↔ 9.90847***	1.99495
Rus_10	-1.99723 **	0.19789	↔ 4.95020**		0.86301
Pol_04	-3.61079 ***	1.84495	0.36346	0.29897	
Pol_17	-5.19486 ***	3.36697**	0.98871	0.35255	0.20816
Pol_PBS_09	-0.37526	6.23982**	1.58424	2.04379	2.26615
Bulgaria_IAB11	-0.58748	1.16971	↔ 7.66846***	7.31646***	1.04249
Bulgaria_FLI12	-1.04066	0.25191	↔ 5.88470**	7.30731***	0.06729

***, ** and * represent rejection of the hypotheses of non-causality at the 1%, 5% and 10% levels of significance. The results from this table are obtained by estimating the model that is presented in Equation 7 from chapter 3. The estimated Z_{t-1} represents the error-correction term lagged by one period. The optimal lag lengths are determined by the Akaike Information Criterion. All variables are in first differences except the error – correction term Z_{t-1}

Table 7: Granger Causality Tests

<u>Table 7.3B:</u> Multivariate Causality Test Results for <u>East Europe</u>

<u>Series:</u> Rus_03, Rus_07, Rus_10, Pol_04, Pol_17, Pol_PBS_09, Bulgaria_IAB11 and Bulgaria_FLI12

Dep.Variable (Lag lengths)	Long-run (t-stat.)	Short run lagged differences (F-statistics)			
	Z_{t-1}	Pol_17	Pol_PBS_09	Bulgaria_IAB11	Bulgaria_FLI12
Rus_03	-1.78301 *	0.09505	1.17739	2.16556	1.29264
Rus_07	-2.55701 **	0.47949	0.21018	↔ 5.47121**	↔ 4.11551**
Rus_10	-1.9972 **	0.04606	4.9E-05	0.97600	0.97145
Pol_04	-3.6107 ***	13.0958**	0.54332	0.01044	0.05834
Pol_17	-5.1948 ***		5.25704**	0.23762	0.99009
Pol_PBS_09	-0.37526	0.57222		0.00525	0.00602 ↔
Bulgaria_IAB11	-0.58748	2.40142	0.02072		5.68100**
Bulgaria_FLI12	-1.04066	0.99009	0.12969	↔ 4.19008**	

***, ** and * represent rejection of the hypotheses of non-causality at the 1%, 5% and 10% levels of significance. The results from this table are obtained by estimating the model that is presented in Equation 7 from chapter 3. The estimated Z_{t-1} represents the error-correction term lagged by one period. The optimal lag lengths are determined by the Akaike Information Criterion. All variables are in first differences except the error – correction term Z_{t-1}

Table 7: Granger Causality Tests

Table 7.4: Multivariate Causality Test Results for Africa

Series: Israel_10, Israel_06, SOAF_06 and SOAF_09

Dep.Variable (Lag lengths)	Long-run (t-stat.)	Short run lagged differences (F-statistics)			
	Z_{t-1}	Israel_10	Israel_06	SOAF_06	SOAF_09
Israel_10	-2.75228 ***		0.45085	0.27588	1.15960
Israel_06	-2.46163 **	0.29965		1.11873	0.18854
SOAF_06	-2.57174 ***	2.51751	2.33675		7.16726***
SOAF_09	-4.92759 ***	0.72463	1.97392	0.00199	

***, ** and * represent rejection of the hypotheses of non-causality at the 1%, 5% and 10% levels of significance. The results from this table are obtained by estimating the model that is presented in Equation 7 from chapter 3. The estimated Z_{t-1} represents the error-correction term lagged by one period. The optimal lag lengths are determined by the Akaike Information Criterion. All variables are in first differences except the error – correction term Z_{t-1}

Figure 1: Original Series

Figure 1.1.1 for Latin America:

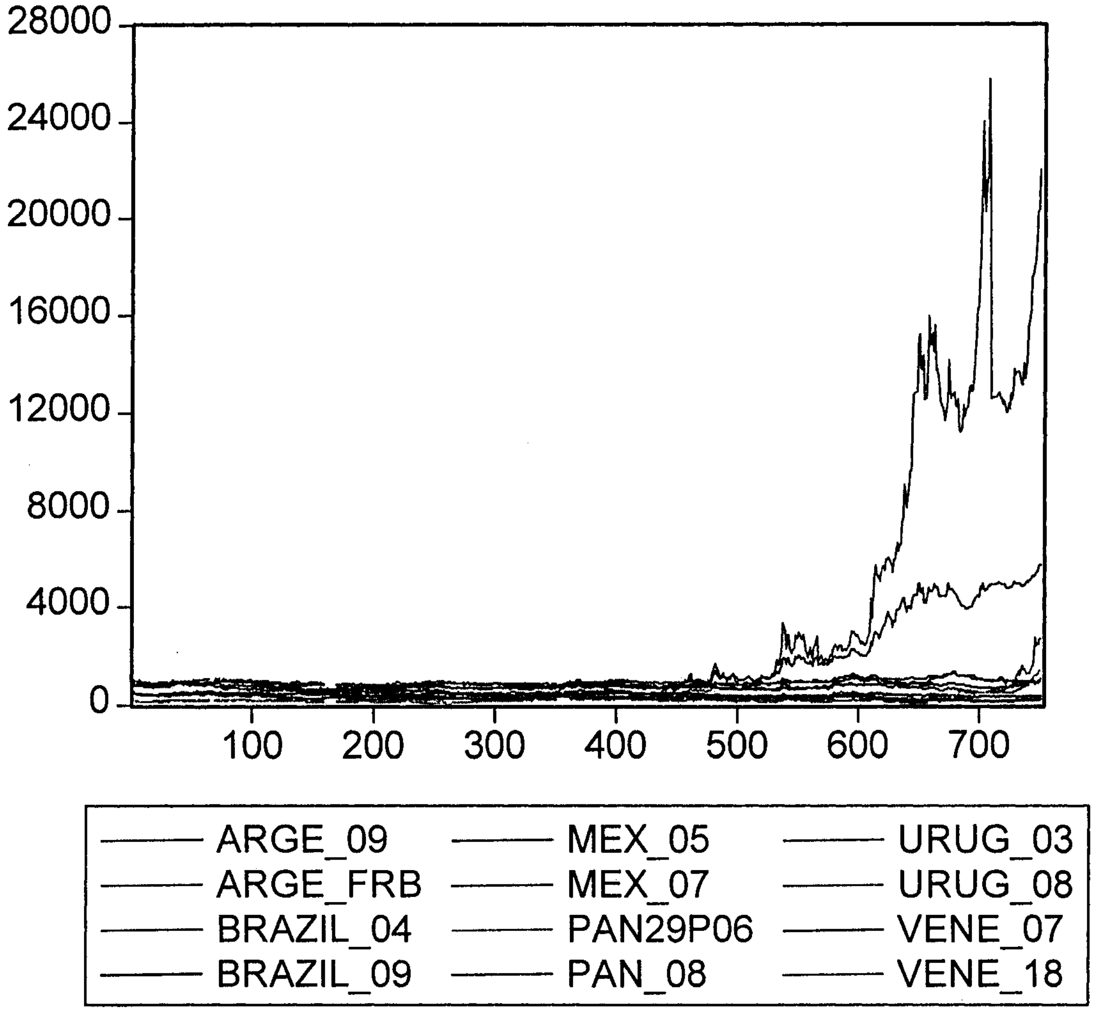


Figure 1: Original Series

Figure 1.1.2 for Latin America:

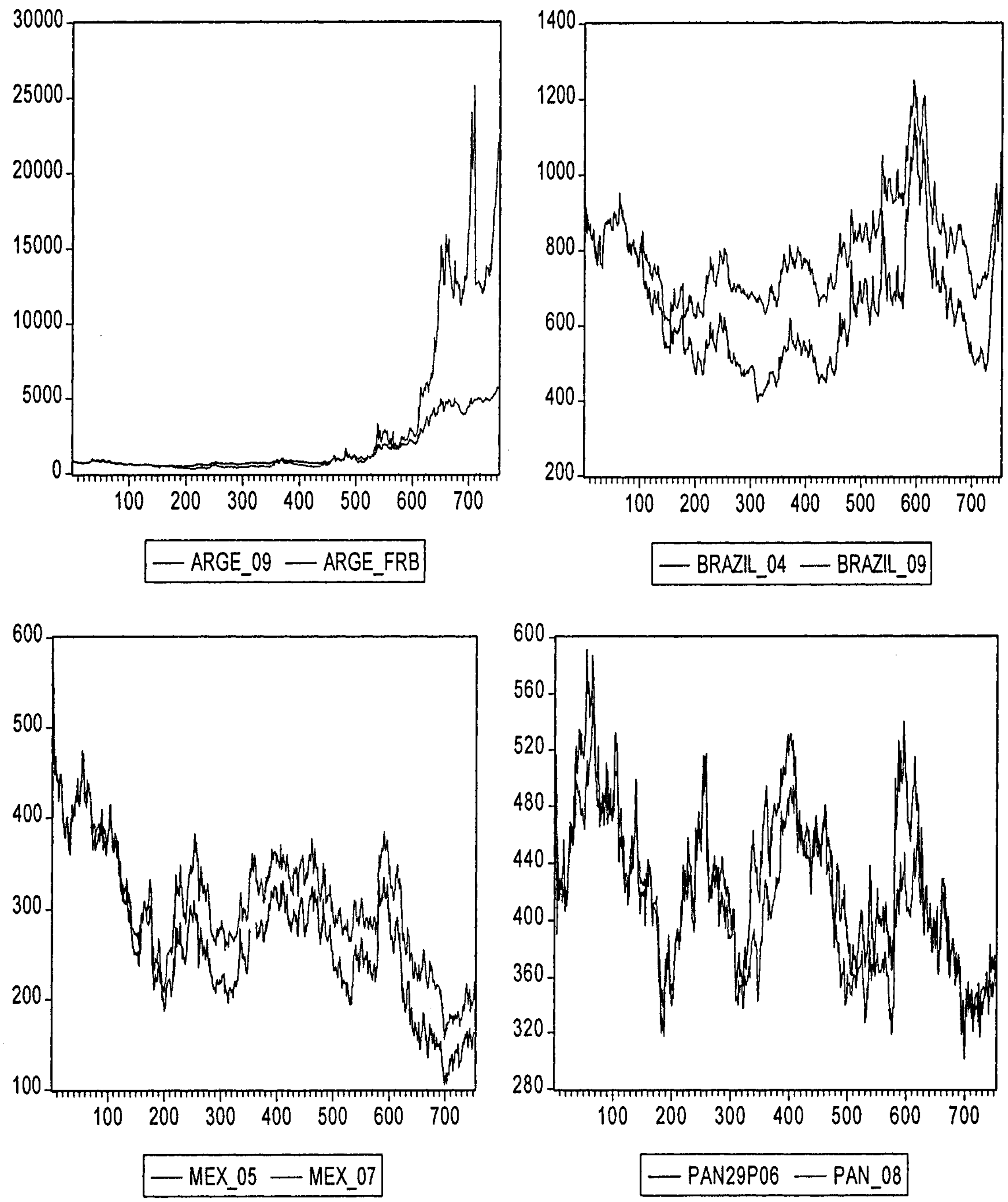


Figure 1: Original Series

Figure 1.1.3 for Latin America:

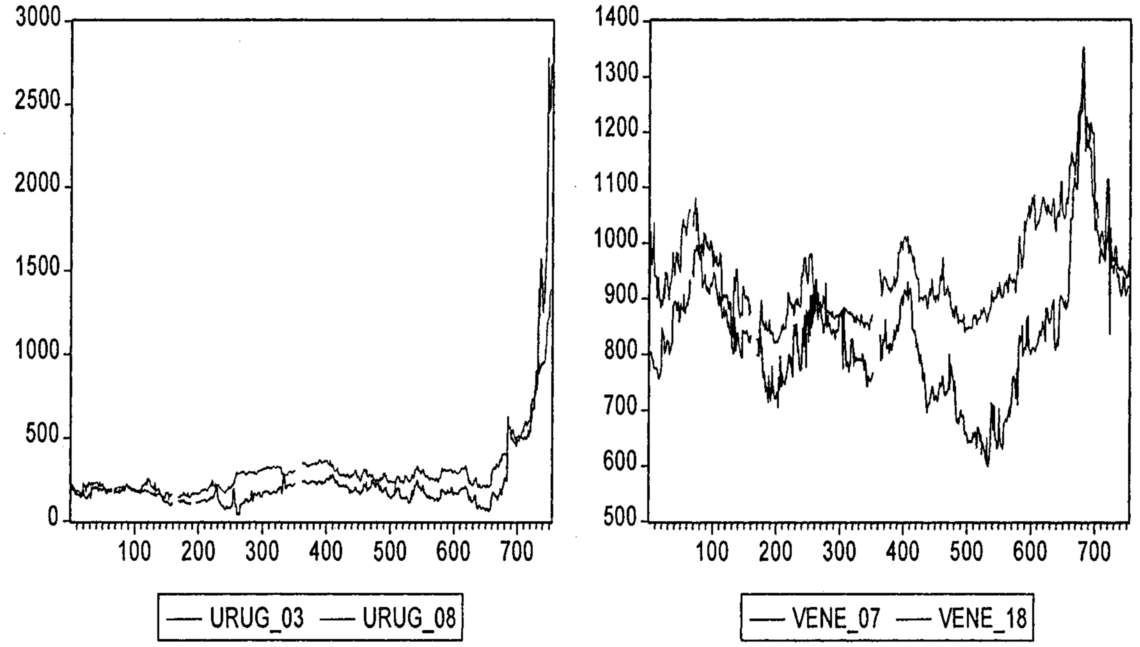


Figure 1: Original Series

Figure 1.2.1 for East Asia:

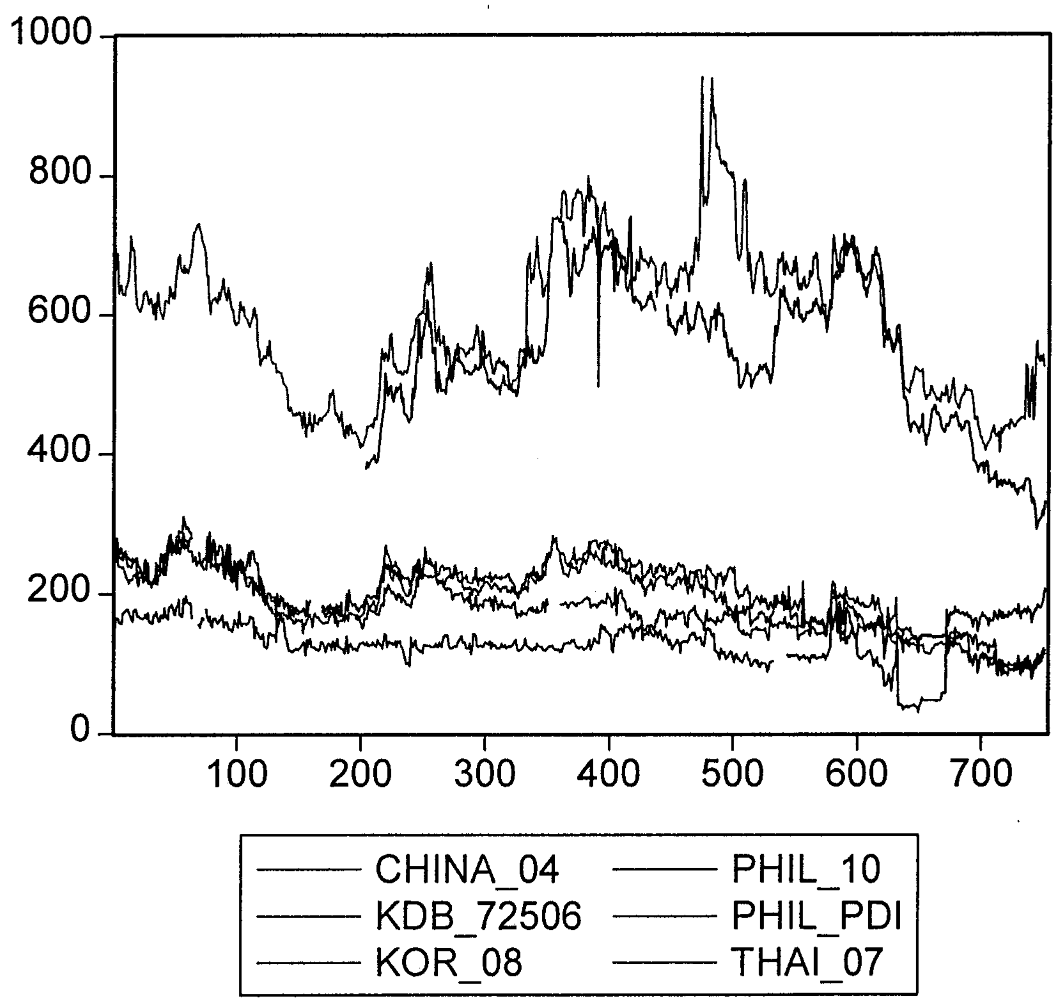


Figure 1: Original Series

Figure 1.2.2 for East Asia:

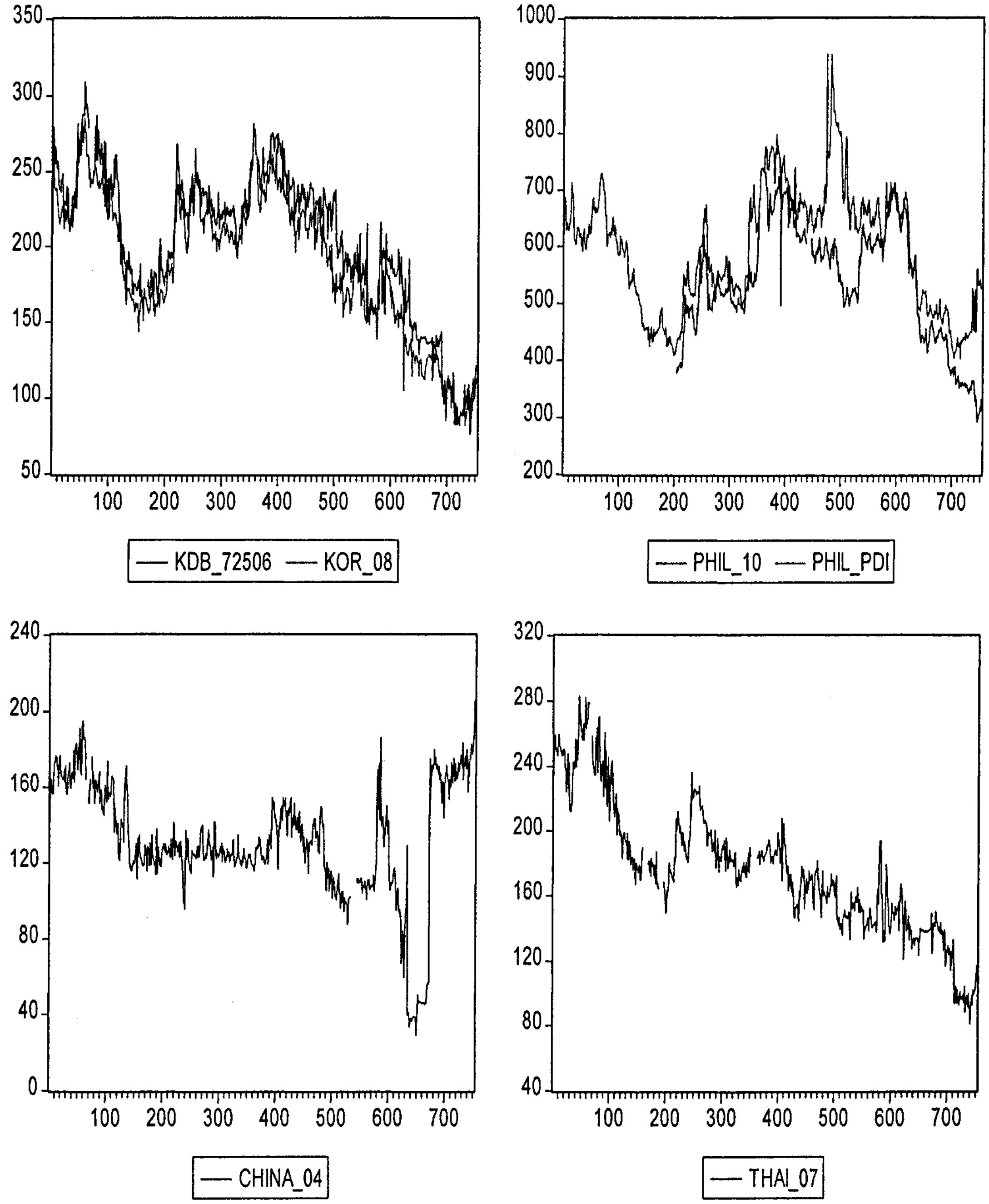


Figure 1: Original Series

Figure 1.3.1 for East Europe:

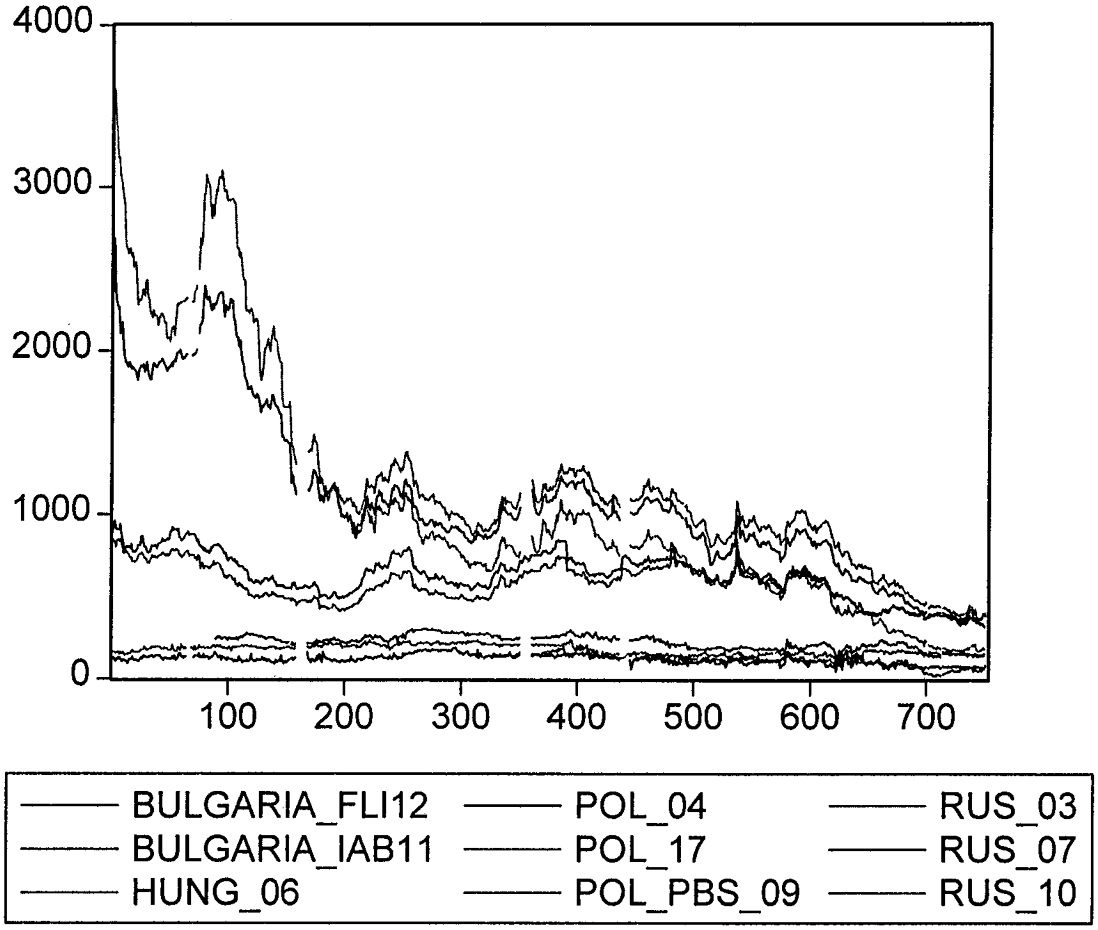


Figure 1: Original Series

Figure 1.3.2 for East Europe:

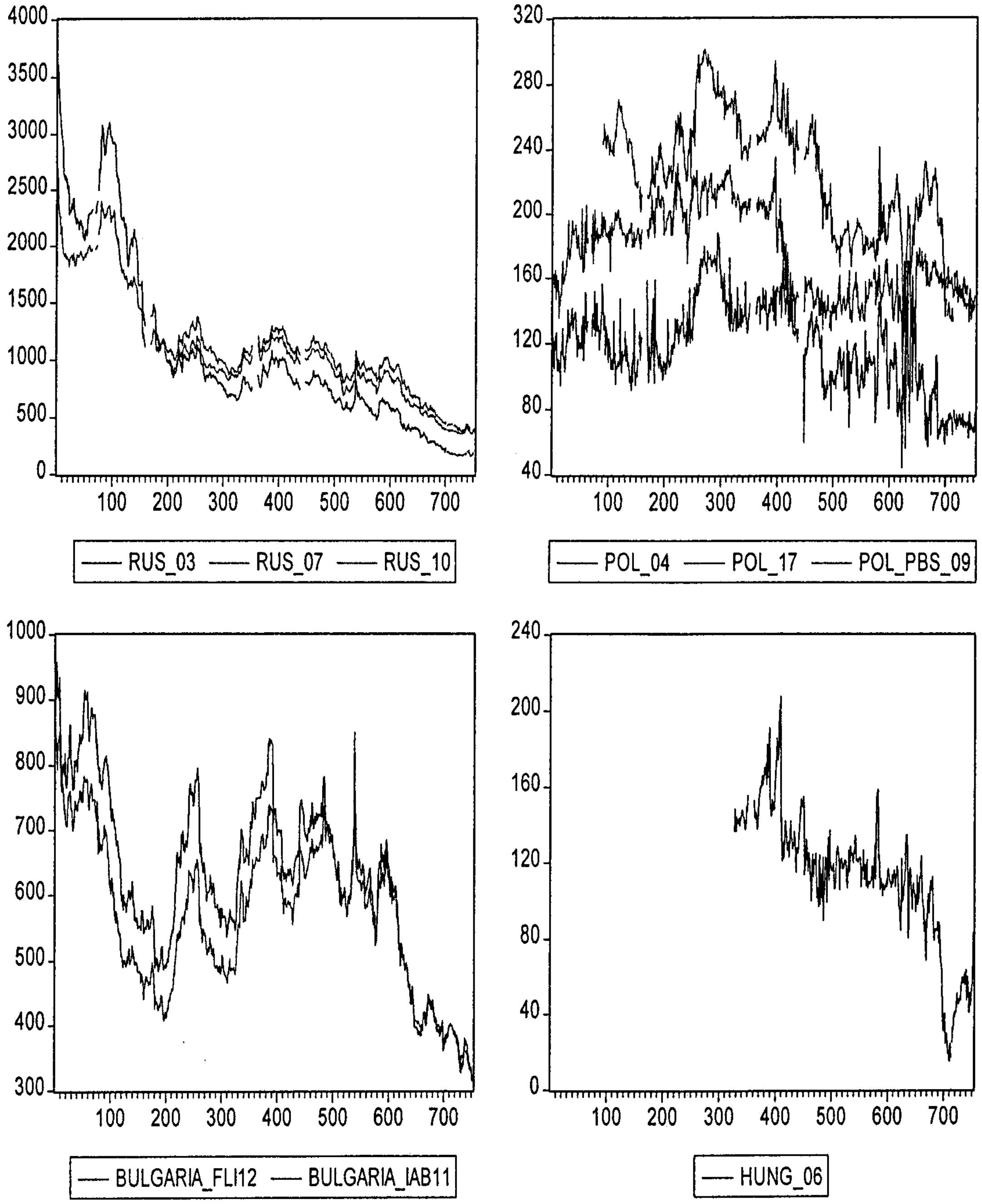


Figure 1: Original Series

Figure 1.4.1 for Africa:

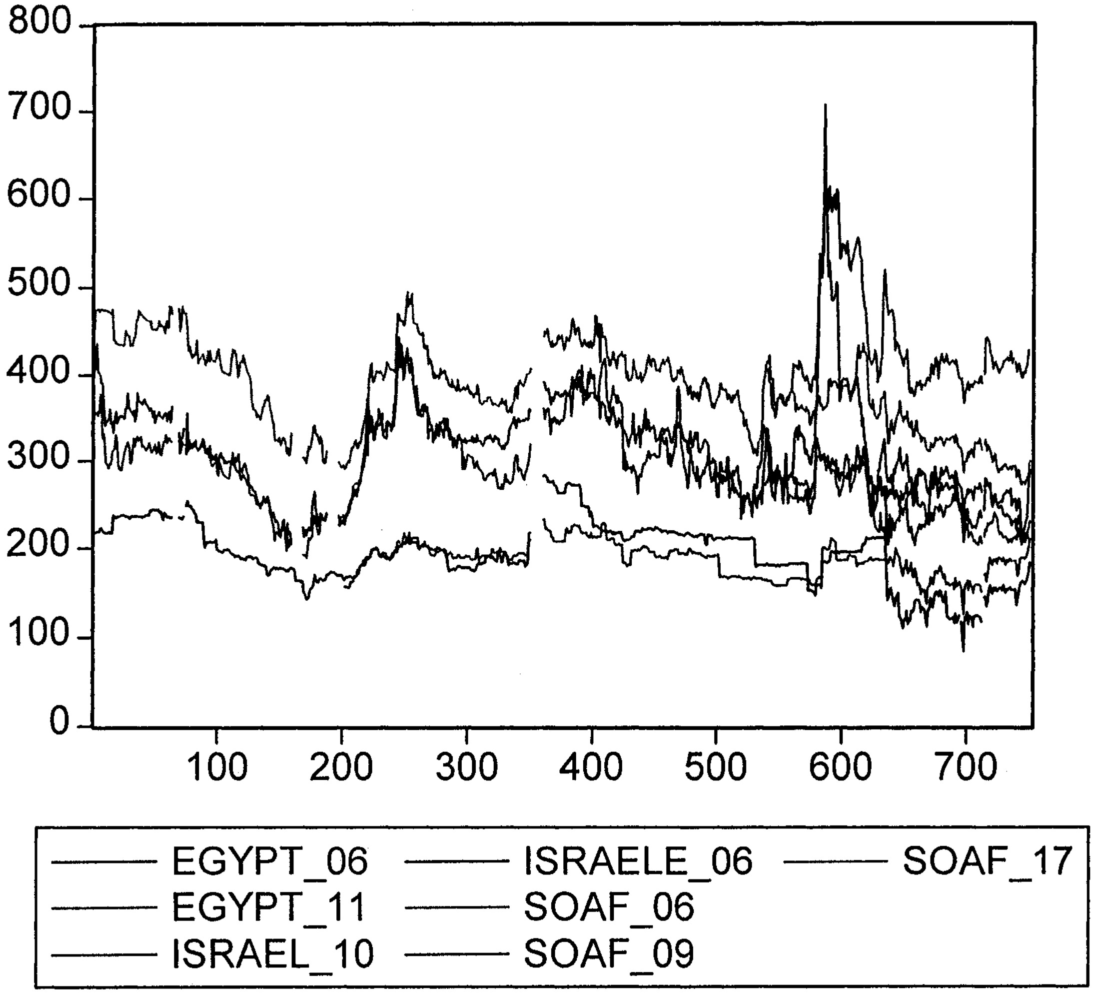


Figure 1: Original Series

Figure 1.4.2 for Africa:

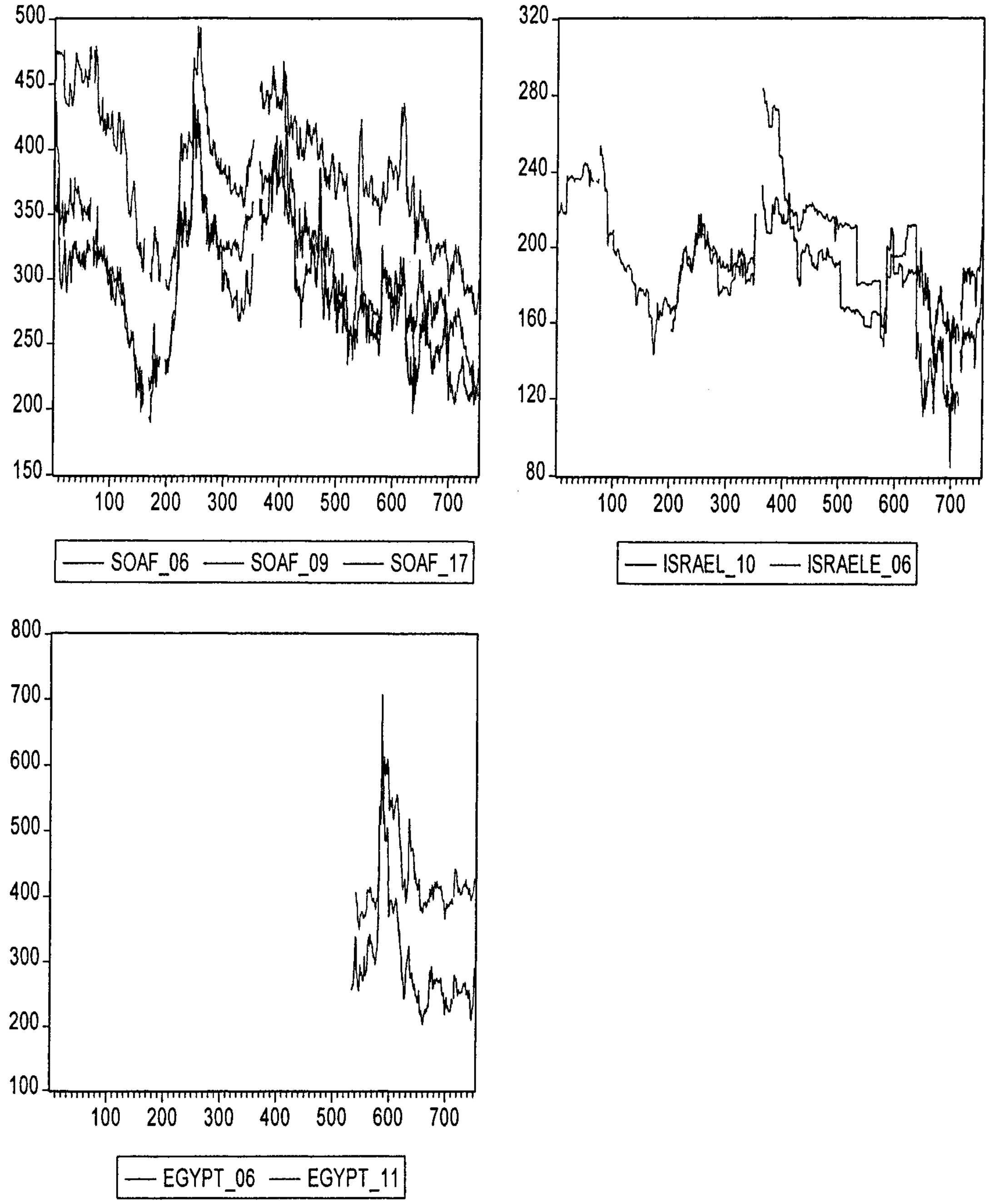


Figure 2: Series in logarithmic form

Figure 2.1.1 for Latin America:

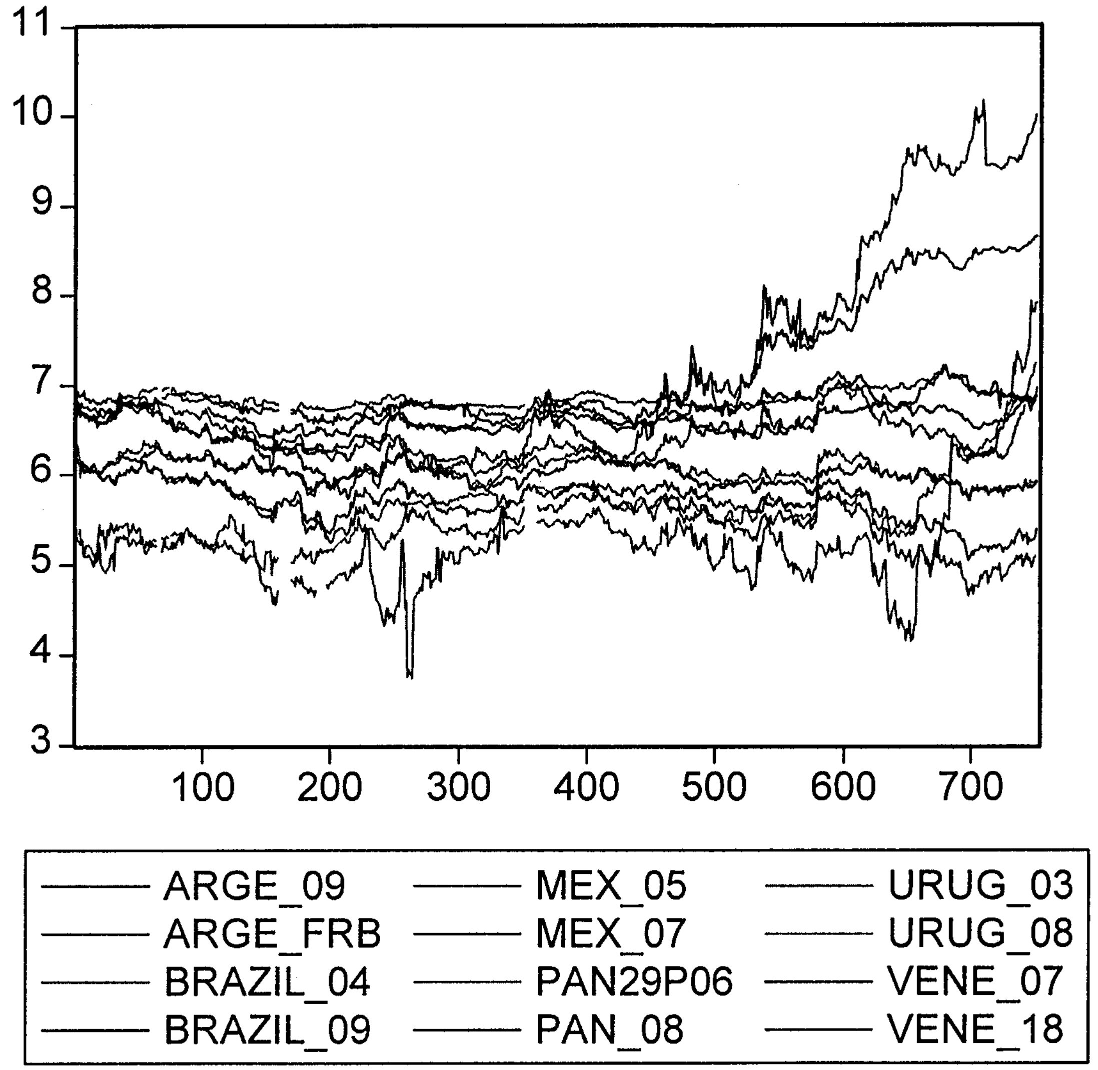


Figure 2: Series in logarithmic form

Figure 2.1.2 for Latin America:

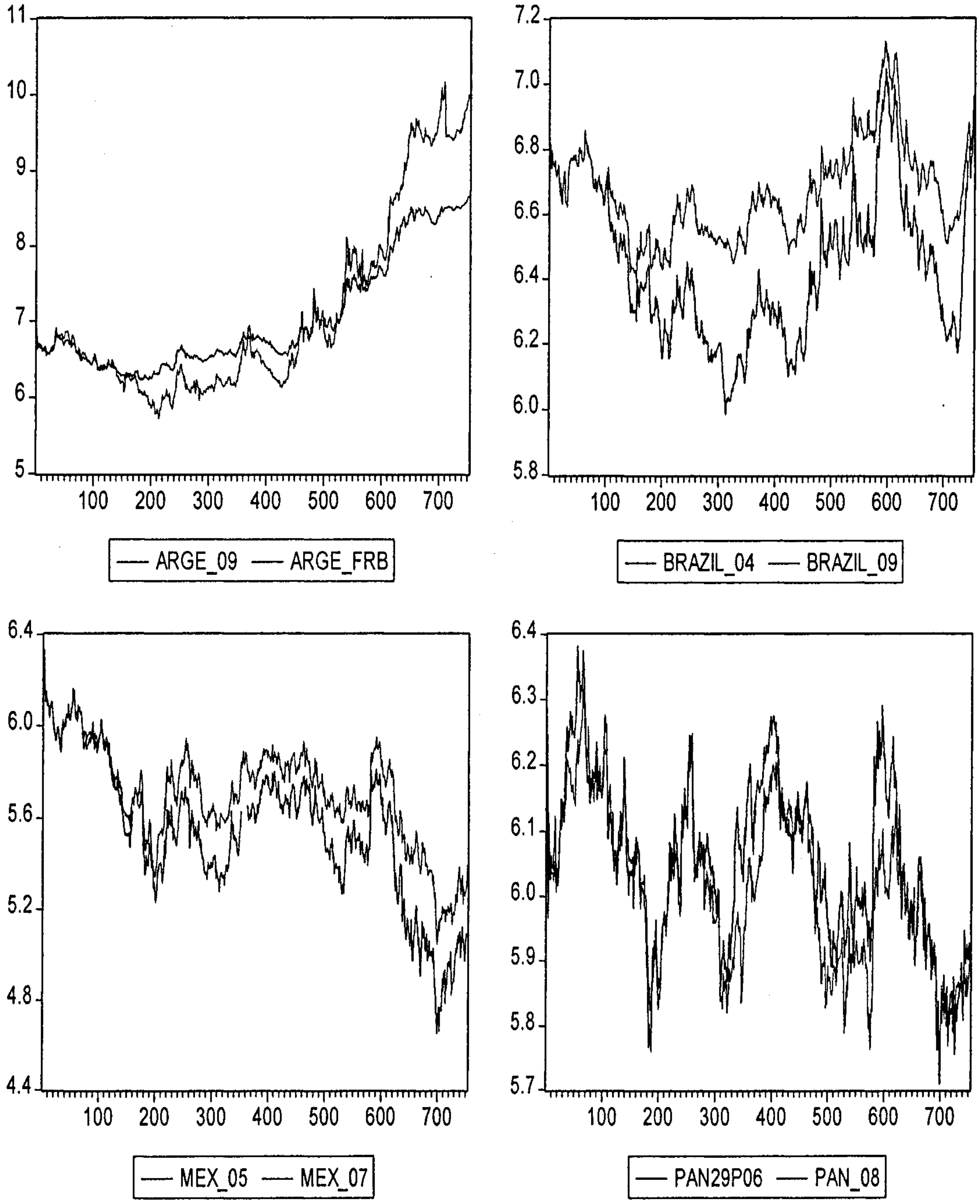


Figure 2: Series in logarithmic form

Figure 2.1.3 for Latin America:

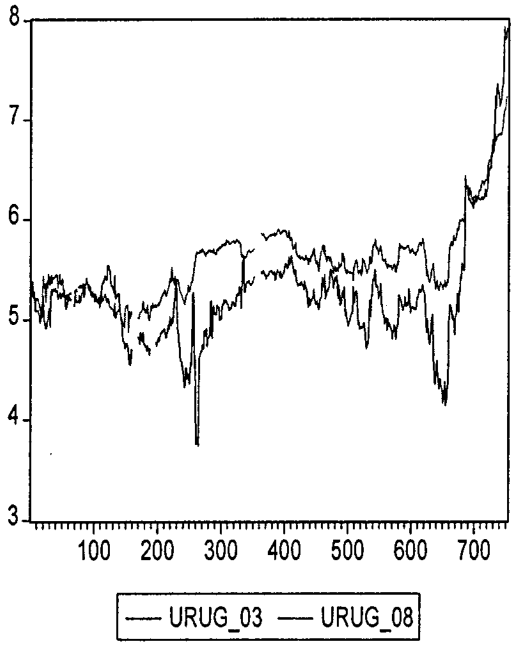


Figure 2: Series in logarithmic form

Figure 2.2.1 for East Asia:

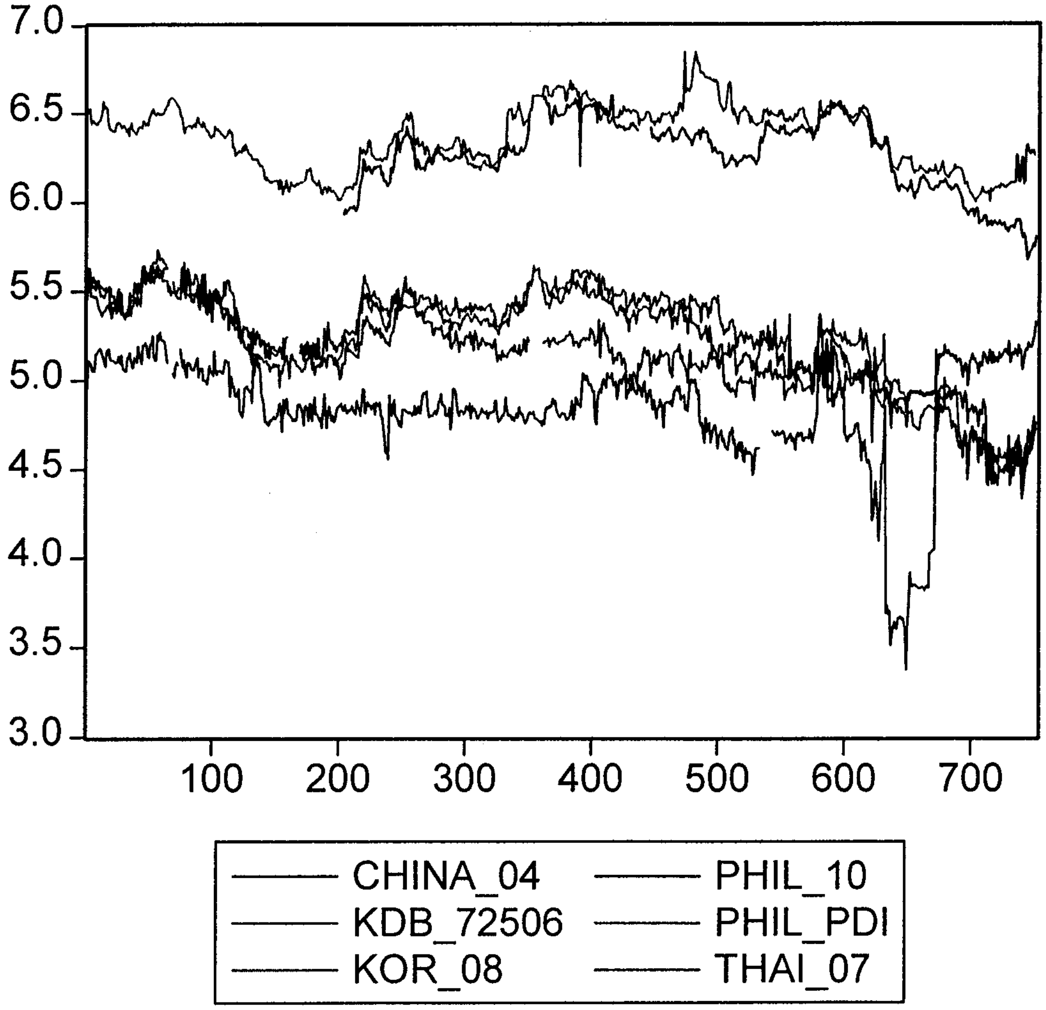


Figure 2: Series in logarithmic form

Figure 2.2.2 for East Asia:

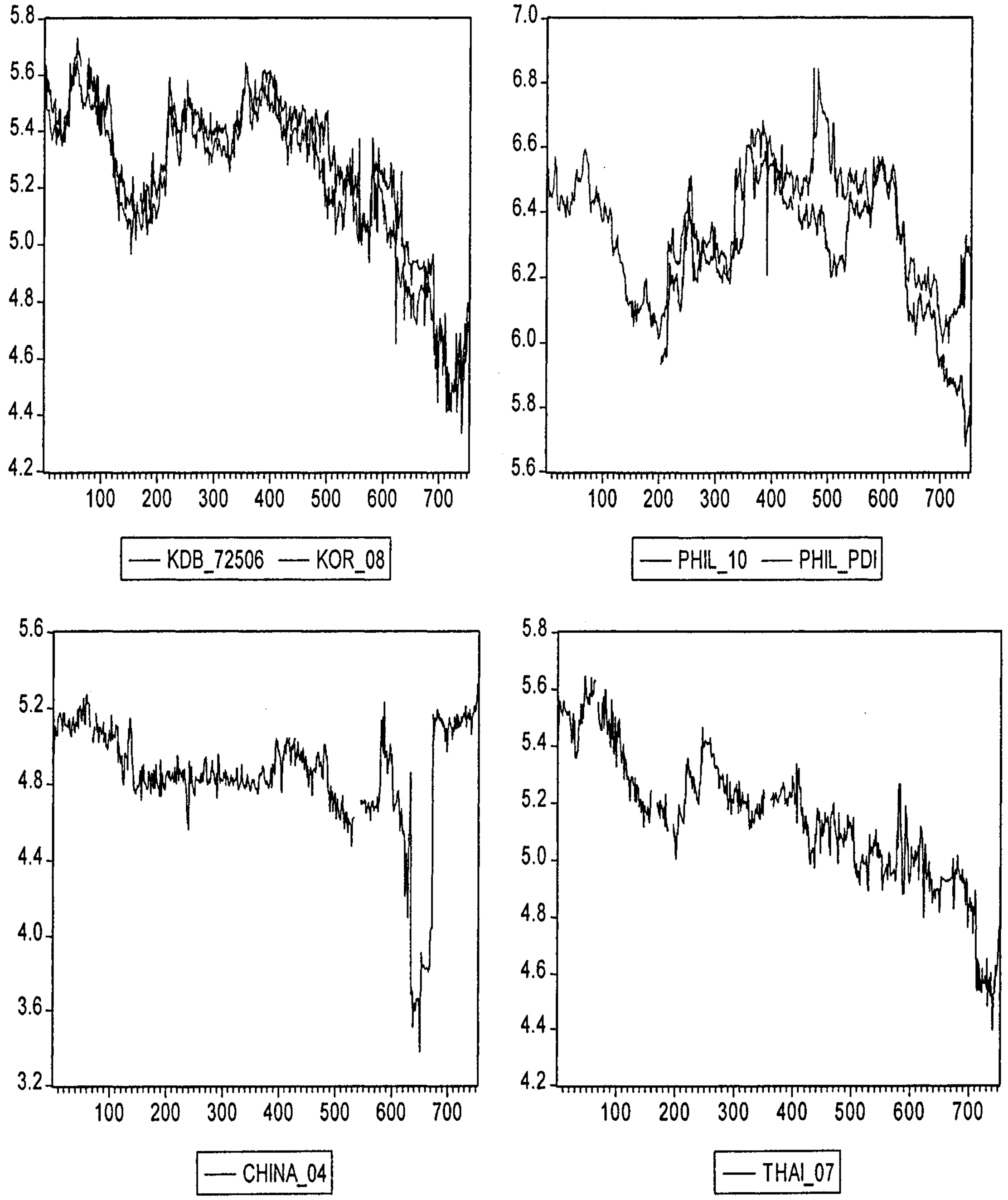


Figure 2: Series in logarithmic form

Figure 2.3.1 for East Europe:

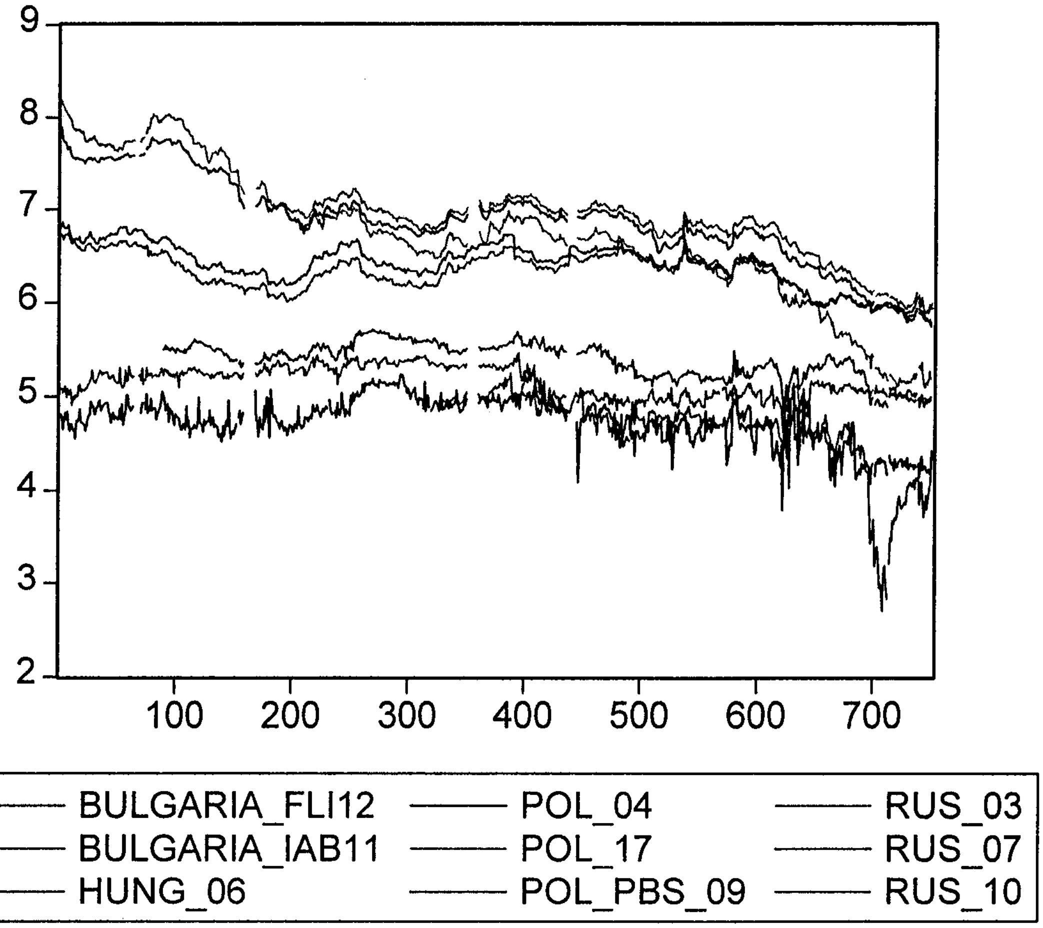


Figure 2: Series in logarithmic form

Figure 2.3.2 for East Europe:

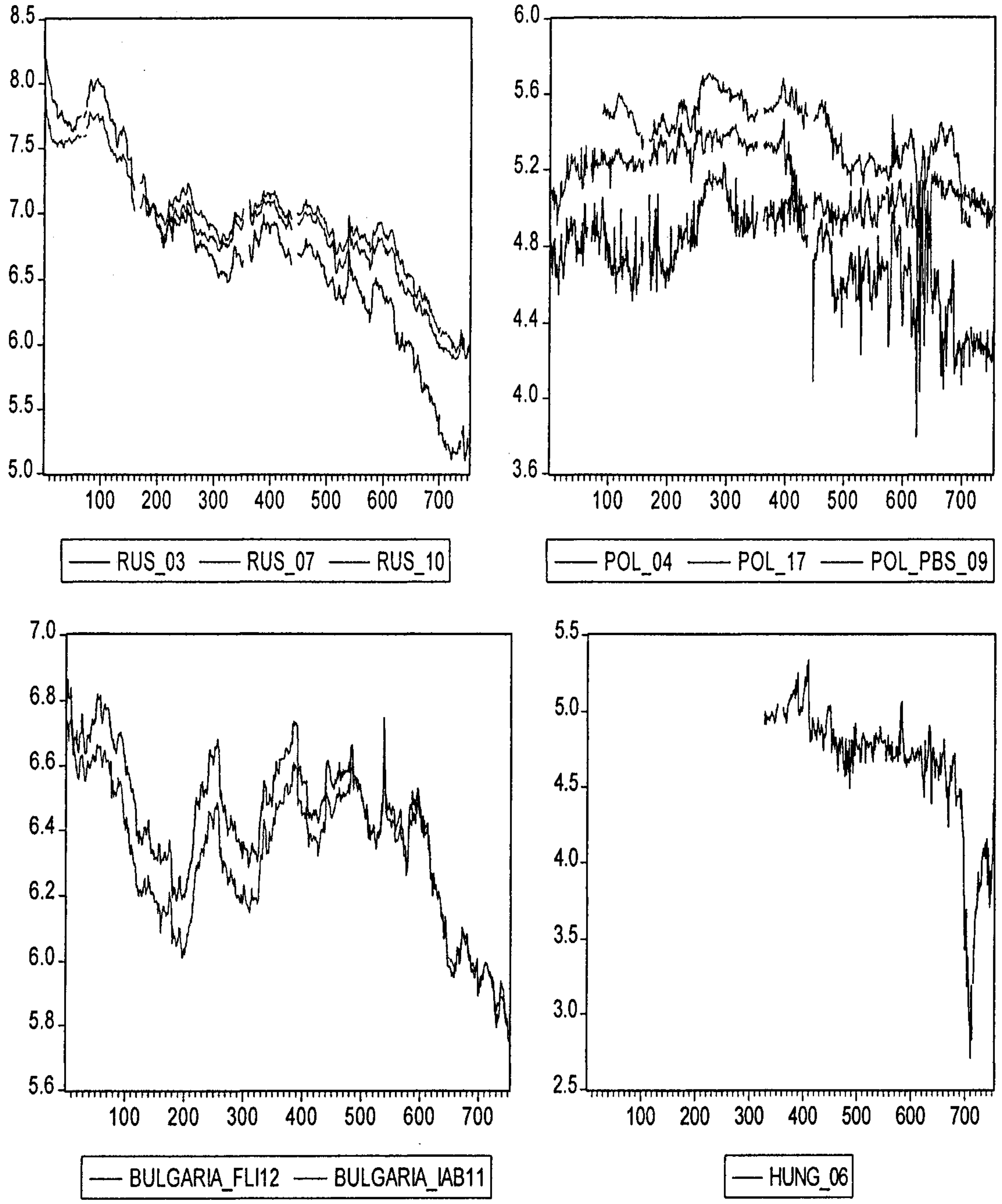


Figure 2: Series in logarithmic form

Figure 2.4.1 for Africa:

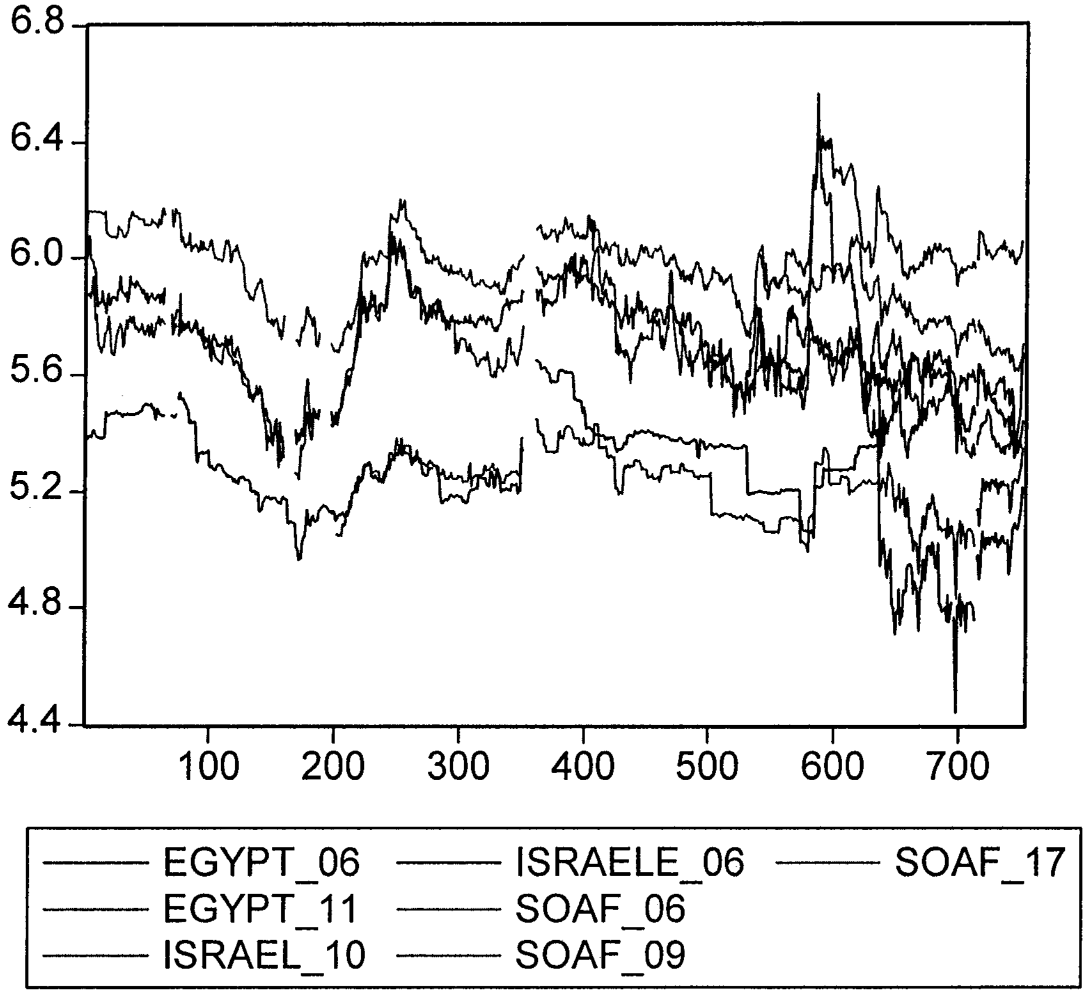


Figure 2: Series in logarithmic form

Figure 2.4.2 for Africa:

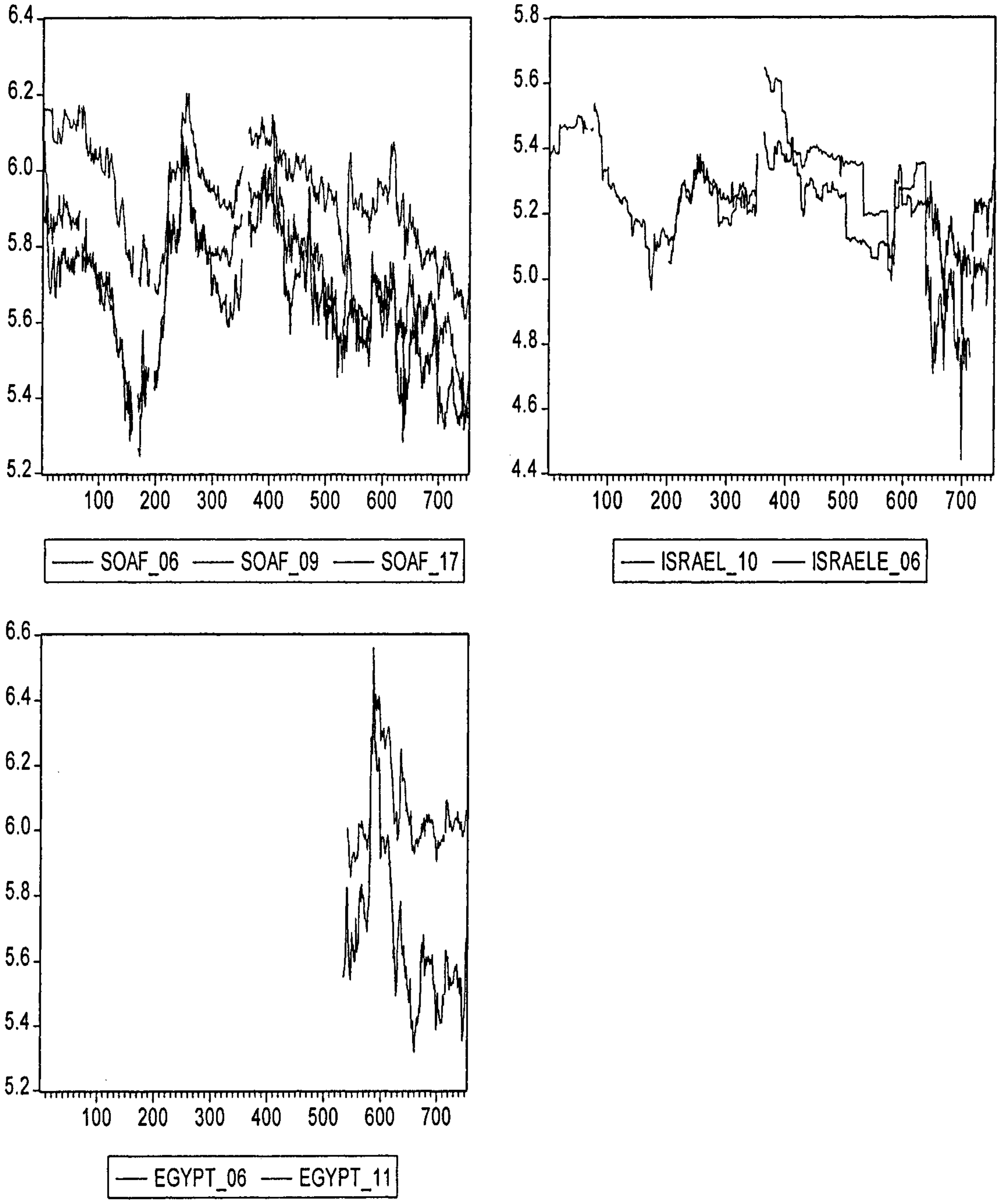
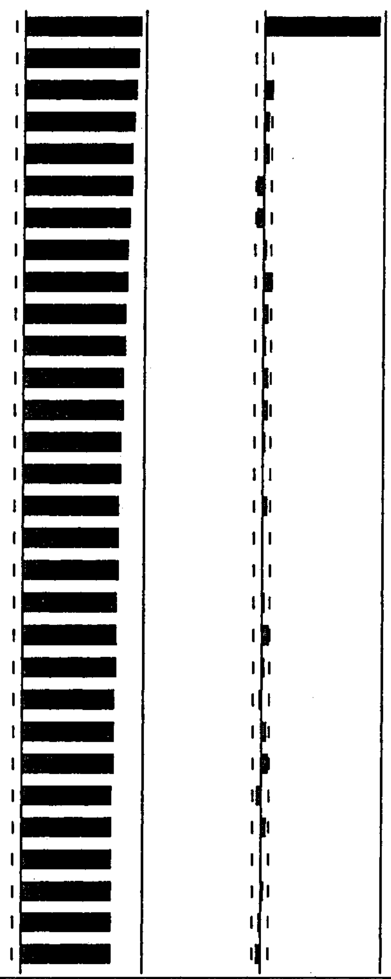


Figure 3: Correlogram for the Series

Figure 3.1.1 for Latin America:

Correlogram of Arge_FRB

Date: 06/07/03 Time: 04:00
Sample: 1 753
Included observations: 751



Lag	AC	PAC	Q-Stat	Prob
1	0.984	0.984	730.27	0.000
2	0.968	-0.006	1438.2	0.000
3	0.955	0.061	2127.3	0.000
4	0.942	0.033	2799.5	0.000
5	0.931	0.038	3456.9	0.000
6	0.918	-0.056	4097.0	0.000
7	0.904	-0.046	4718.2	0.000
8	0.891	0.019	5322.1	0.000
9	0.880	0.071	5912.3	0.000
10	0.871	0.040	6491.1	0.000
11	0.862	0.022	7059.1	0.000
12	0.854	0.028	7617.1	0.000
13	0.846	0.028	8165.8	0.000
14	0.839	0.012	8706.2	0.000
15	0.832	-0.008	9238.1	0.000
16	0.826	0.034	9763.0	0.000
17	0.820	-0.005	10280.	0.000
18	0.813	-0.008	10790.	0.000
19	0.806	0.015	11292.	0.000
20	0.801	0.045	11788.	0.000
21	0.796	0.016	12279.	0.000
22	0.791	-0.014	12764.	0.000
23	0.786	0.036	13244.	0.000
24	0.783	0.053	13720.	0.000
25	0.778	-0.025	14192.	0.000
26	0.775	0.031	14661.	0.000
27	0.772	0.004	15126.	0.000
28	0.768	0.010	15588.	0.000
29	0.764	-0.012	16046.	0.000
30	0.760	-0.025	16498.	0.000

Figure 3: Correlogram for the Series

Figure 3.1.2 for Latin America:

Correlogram of Arge_09

Date: 06/07/03 Time: 04:02
Sample: 1 753
Included observations: 752

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	0.993	0.993	744.36	0.000
		2	0.986	-0.006	1479.1	0.000
		3	0.979	0.002	2204.3	0.000
		4	0.972	0.040	2921.1	0.000
		5	0.966	-0.008	3629.3	0.000
		6	0.960	0.032	4329.6	0.000
		7	0.954	0.017	5022.6	0.000
		8	0.949	0.005	5708.4	0.000
		9	0.943	0.015	6387.3	0.000
		10	0.938	0.035	7060.1	0.000
		11	0.933	-0.001	7726.8	0.000
		12	0.928	-0.012	8387.1	0.000
		13	0.923	-0.034	9040.5	0.000
		14	0.917	-0.007	9686.7	0.000
		15	0.912	0.004	10326.	0.000
		16	0.906	-0.006	10958.	0.000
		17	0.900	-0.023	11583.	0.000
		18	0.894	-0.008	12201.	0.000
		19	0.888	-0.004	12811.	0.000
		20	0.883	0.014	13415.	0.000
		21	0.877	0.017	14012.	0.000
		22	0.872	-0.017	14602.	0.000
		23	0.866	-0.017	15185.	0.000
		24	0.861	0.025	15762.	0.000
		25	0.855	0.004	16333.	0.000
		26	0.850	-0.010	16897.	0.000
		27	0.845	0.009	17455.	0.000
		28	0.839	-0.016	18007.	0.000
		29	0.834	-0.027	18552.	0.000
		30	0.828	0.002	19090.	0.000

Figure 3: Correlogram for the Series

Figure 3.1.3 for Latin America:

Correlogram of Mex_05

Date: 06/07/03 Time: 04:32
Sample: 1 753
Included observations: 727

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	0.975	0.975	694.55	0.000
		2	0.951	-0.015	1355.3	0.000
		3	0.931	0.092	1989.9	0.000
		4	0.915	0.057	2603.3	0.000
		5	0.902	0.076	3200.4	0.000
		6	0.893	0.098	3787.2	0.000
		7	0.883	-0.022	4361.2	0.000
		8	0.872	0.016	4922.0	0.000
		9	0.860	-0.010	5468.5	0.000
		10	0.845	-0.069	5996.4	0.000
		11	0.835	0.110	6512.9	0.000
		12	0.825	-0.027	7017.9	0.000
		13	0.815	-0.008	7510.6	0.000
		14	0.804	-0.005	7991.0	0.000
		15	0.794	0.002	8459.8	0.000
		16	0.784	0.042	8918.3	0.000
		17	0.774	-0.032	9365.9	0.000
		18	0.764	-0.003	9802.1	0.000
		19	0.754	0.009	10228.	0.000
		20	0.744	-0.027	10642.	0.000
		21	0.734	0.030	11047.	0.000
		22	0.726	0.024	11443.	0.000
		23	0.719	0.009	11832.	0.000
		24	0.712	0.015	12214.	0.000
		25	0.704	-0.024	12589.	0.000
		26	0.695	0.002	12954.	0.000
		27	0.686	0.001	13310.	0.000
		28	0.680	0.031	13661.	0.000
		29	0.672	-0.021	14003.	0.000
		30	0.664	-0.001	14339.	0.000

Figure 3: Correlogram for the Series

<u>Figure 3.1.4 for Latin America</u>:

<u>Correlogram of Mex_07</u>

Date: 06/07/03 Time: 04:35
Sample: 1 753
Included observations: 752

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	0.982	0.982	727.35	0.000
		2	0.960	-0.088	1424.3	0.000
		3	0.942	0.082	2095.9	0.000
		4	0.926	0.053	2746.6	0.000
		5	0.909	-0.054	3374.4	0.000
		6	0.894	0.051	3981.9	0.000
		7	0.880	0.033	4571.8	0.000
		8	0.867	-0.018	5144.1	0.000
		9	0.854	0.055	5701.2	0.000
		10	0.842	-0.018	6243.1	0.000
		11	0.832	0.067	6773.0	0.000
		12	0.821	-0.027	7290.1	0.000
		13	0.809	-0.033	7792.7	0.000
		14	0.796	-0.014	8280.2	0.000
		15	0.782	-0.047	8751.1	0.000
		16	0.768	-0.005	9205.8	0.000
		17	0.754	0.001	9644.7	0.000
		18	0.742	0.022	10070.	0.000
		19	0.730	0.020	10483.	0.000
		20	0.720	0.006	10884.	0.000
		21	0.709	0.013	11274.	0.000
		22	0.699	0.007	11653.	0.000
		23	0.690	0.015	12024.	0.000
		24	0.681	-0.016	12385.	0.000
		25	0.670	-0.044	12735.	0.000
		26	0.659	0.031	13074.	0.000
		27	0.648	-0.028	13403.	0.000
		28	0.638	0.029	13723.	0.000
		29	0.628	-0.020	14032.	0.000
		30	0.617	0.000	14331.	0.000

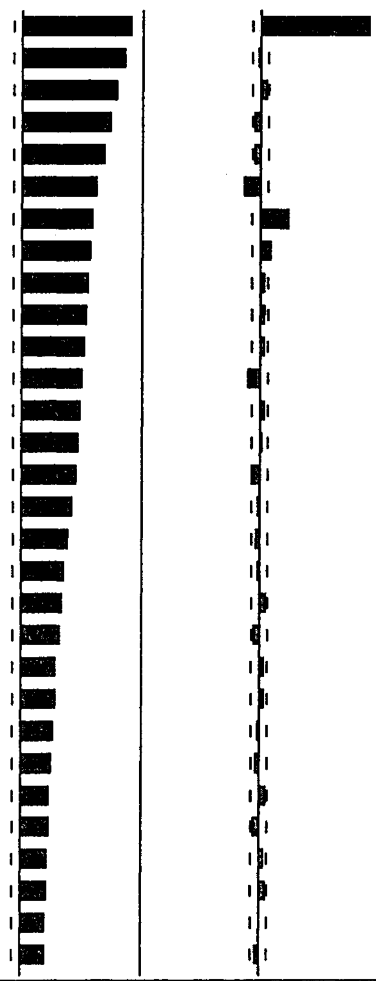
Figure 3: Correlogram for the Series

Figure 3.1.5 for Latin America:

Correlogram of URUG_03

Date: 06/07/03 Time: 05:07
Sample: 1 753
Included observations: 720

Autocorrelation | Partial Correlation



	AC	PAC	Q-Stat	Prob
1	0.938	0.938	636.55	0.000
2	0.879	-0.015	1195.5	0.000
3	0.828	0.042	1692.3	0.000
4	0.775	-0.043	2128.1	0.000
5	0.718	-0.055	2503.2	0.000
6	0.649	-0.141	2810.2	0.000
7	0.614	0.239	3085.1	0.000
8	0.592	0.087	3341.2	0.000
9	0.571	0.037	3579.9	0.000
10	0.555	0.027	3805.3	0.000
11	0.544	0.034	4022.1	0.000
12	0.529	-0.109	4227.4	0.000
13	0.513	0.035	4421.1	0.000
14	0.496	0.012	4602.1	0.000
15	0.469	-0.072	4764.3	0.000
16	0.440	-0.015	4907.6	0.000
17	0.406	-0.031	5029.5	0.000
18	0.376	-0.010	5134.3	0.000
19	0.353	0.047	5226.7	0.000
20	0.323	-0.049	5304.0	0.000
21	0.302	0.035	5371.9	0.000
22	0.289	0.032	5434.1	0.000
23	0.278	-0.017	5491.6	0.000
24	0.264	-0.040	5543.8	0.000
25	0.254	0.055	5592.0	0.000
26	0.244	-0.047	5636.5	0.000
27	0.236	0.038	5678.4	0.000
28	0.229	0.042	5717.8	0.000
29	0.221	0.008	5754.5	0.000
30	0.213	-0.031	5788.7	0.000

Figure 3: Correlogram for the Series

Figure 3.1.6 for Latin America:

Correlogram of URUG_08

Date: 06/07/03 Time: 05:10
Sample: 1 753
Included observations: 727

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	0.963	0.963	677.27	0.000
		2	0.929	0.011	1307.6	0.000
		3	0.899	0.059	1899.8	0.000
		4	0.870	-0.013	2454.9	0.000
		5	0.842	-0.001	2974.9	0.000
		6	0.815	0.017	3463.6	0.000
		7	0.794	0.063	3928.1	0.000
		8	0.774	0.007	4369.8	0.000
		9	0.757	0.045	4792.9	0.000
		10	0.740	0.000	5198.0	0.000
		11	0.724	0.008	5586.0	0.000
		12	0.707	-0.019	5956.1	0.000
		13	0.689	0.002	6308.8	0.000
		14	0.671	-0.018	6643.9	0.000
		15	0.652	-0.015	6960.6	0.000
		16	0.634	-0.004	7260.1	0.000
		17	0.615	-0.013	7542.4	0.000
		18	0.597	0.001	7808.8	0.000
		19	0.575	-0.063	8056.6	0.000
		20	0.558	0.049	8290.2	0.000
		21	0.543	0.009	8511.6	0.000
		22	0.529	0.020	8722.1	0.000
		23	0.515	-0.007	8922.0	0.000
		24	0.502	-0.002	9111.8	0.000
		25	0.489	-0.005	9291.9	0.000
		26	0.476	0.017	9463.5	0.000
		27	0.463	-0.021	9625.8	0.000
		28	0.449	-0.003	9778.9	0.000
		29	0.435	-0.019	9922.4	0.000
		30	0.422	0.014	10058.	0.000

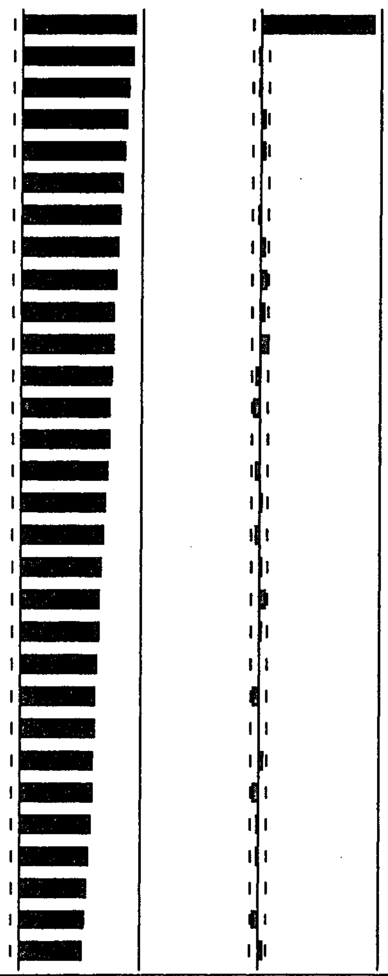
Figure 3: Correlogram for the Series

Figure 3.1.7 for Latin America:

Correlogram of PAN_08

Date: 06/07/03 Time: 05:37
Sample: 1 753
Included observations: 752

Autocorrelation | Partial Correlation



	AC	PAC	Q-Stat	Prob
1	0.978	0.978	722.12	0.000
2	0.956	-0.020	1412.4	0.000
3	0.933	-0.024	2070.8	0.000
4	0.911	0.031	2700.6	0.000
5	0.892	0.026	3304.7	0.000
6	0.873	-0.003	3884.0	0.000
7	0.854	-0.015	4438.8	0.000
8	0.836	0.027	4971.4	0.000
9	0.821	0.045	5485.3	0.000
10	0.807	0.027	5982.7	0.000
11	0.796	0.063	6467.5	0.000
12	0.784	-0.025	6938.8	0.000
13	0.770	-0.047	7394.2	0.000
14	0.757	0.006	7834.3	0.000
15	0.742	-0.029	8257.9	0.000
16	0.728	0.013	8666.5	0.000
17	0.713	-0.036	9058.7	0.000
18	0.699	0.019	9436.0	0.000
19	0.687	0.045	9800.6	0.000
20	0.675	0.012	10154.	0.000
21	0.664	0.007	10496.	0.000
22	0.652	-0.043	10826.	0.000
23	0.640	-0.007	11145.	0.000
24	0.630	0.039	11454.	0.000
25	0.618	-0.049	11751.	0.000
26	0.605	-0.020	12037.	0.000
27	0.591	-0.023	12310.	0.000
28	0.577	-0.002	12571.	0.000
29	0.562	-0.042	12819.	0.000
30	0.548	0.034	13055.	0.000

Figure 3: Correlogram for the Series

Figure 3.1.8 for Latin America:

Correlogram of PAN29P06

Date: 06/07/03 Time: 13:30
Sample: 1 753
Included observations: 751

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	0.970	0.970	710.04	0.000
		2	0.941	-0.009	1378.8	0.000
		3	0.915	0.030	2011.2	0.000
		4	0.891	0.042	2612.6	0.000
		5	0.866	-0.050	3180.5	0.000
		6	0.842	0.034	3719.0	0.000
		7	0.820	0.000	4230.0	0.000
		8	0.802	0.073	4719.9	0.000
		9	0.787	0.043	5192.4	0.000
		10	0.772	-0.016	5646.8	0.000
		11	0.757	0.031	6085.1	0.000
		12	0.744	0.003	6508.4	0.000
		13	0.728	-0.038	6914.6	0.000
		14	0.711	-0.023	7302.4	0.000
		15	0.692	-0.047	7669.8	0.000
		16	0.670	-0.049	8014.9	0.000
		17	0.651	0.044	8341.5	0.000
		18	0.632	-0.018	8650.2	0.000
		19	0.617	0.053	8944.3	0.000
		20	0.600	-0.031	9223.1	0.000
		21	0.586	0.026	9489.4	0.000
		22	0.569	-0.056	9740.9	0.000
		23	0.557	0.053	9982.0	0.000
		24	0.544	-0.006	10212.	0.000
		25	0.530	-0.031	10431.	0.000
		26	0.514	-0.016	10637.	0.000
		27	0.499	-0.008	10831.	0.000
		28	0.483	-0.007	11014.	0.000
		29	0.465	-0.053	11183.	0.000
		30	0.448	0.024	11340.	0.000

Figure 3: Correlogram for the Series

Figure 3.1.9 for Latin America:

Correlogram of Vene_07

Date: 06/07/03 Time: 13:32
Sample: 1 753
Included observations: 726

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	0.975	0.975	693.52	0.000
		2	0.962	0.217	1368.9	0.000
		3	0.951	0.097	2029.7	0.000
		4	0.939	0.015	2674.8	0.000
		5	0.927	0.010	3305.3	0.000
		6	0.920	0.091	3926.7	0.000
		7	0.908	-0.058	4532.9	0.000
		8	0.897	-0.020	5124.6	0.000
		9	0.886	0.012	5703.9	0.000
		10	0.875	-0.015	6269.5	0.000
		11	0.864	-0.005	6821.6	0.000
		12	0.856	0.035	7363.5	0.000
		13	0.843	-0.065	7890.2	0.000
		14	0.831	-0.017	8402.7	0.000
		15	0.819	-0.011	8901.7	0.000
		16	0.805	-0.059	9384.5	0.000
		17	0.792	-0.017	9851.8	0.000
		18	0.776	-0.077	10302.	0.000
		19	0.757	-0.102	10730.	0.000
		20	0.741	-0.002	11142.	0.000
		21	0.728	0.048	11539.	0.000
		22	0.711	-0.044	11919.	0.000
		23	0.695	-0.041	12282.	0.000
		24	0.678	-0.022	12628.	0.000
		25	0.662	0.013	12959.	0.000
		26	0.648	0.031	13276.	0.000
		27	0.636	0.065	13582.	0.000
		28	0.623	-0.007	13876.	0.000
		29	0.610	0.018	14158.	0.000
		30	0.598	0.011	14429.	0.000

Figure 3: Correlogram for the Series

Figure 3.1.10 for Latin America:

Correlogram of Vene_18

Date: 06/07/03 Time: 13:34
Sample: 1 753
Included observations: 728

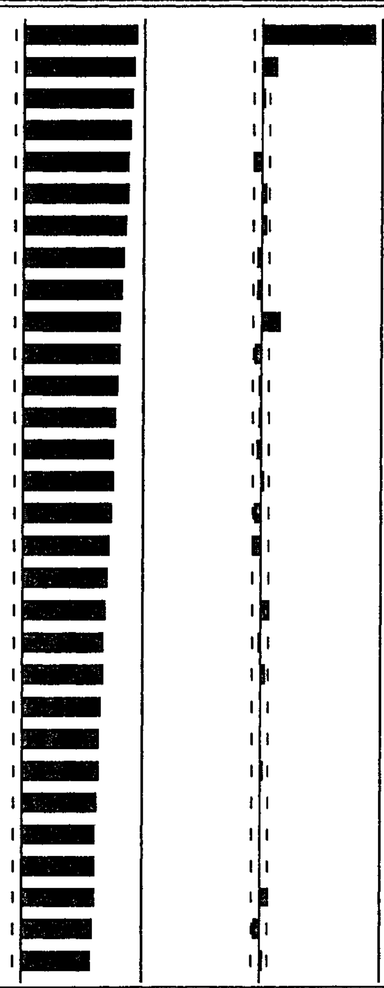
Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	0.974	0.974	692.98	0.000
		2	0.952	0.084	1356.9	0.000
		3	0.931	-0.002	1992.3	0.000
		4	0.913	0.063	2604.8	0.000
		5	0.899	0.070	3199.2	0.000
		6	0.888	0.058	3779.2	0.000
		7	0.877	0.026	4345.8	0.000
		8	0.866	0.018	4899.7	0.000
		9	0.856	0.027	5441.8	0.000
		10	0.845	-0.019	5970.4	0.000
		11	0.834	0.005	6485.9	0.000
		12	0.824	0.016	6989.3	0.000
		13	0.810	-0.067	7476.5	0.000
		14	0.796	-0.017	7948.0	0.000
		15	0.784	0.022	8405.7	0.000
		16	0.771	-0.024	8848.9	0.000
		17	0.755	-0.066	9275.2	0.000
		18	0.740	-0.022	9684.9	0.000
		19	0.724	-0.018	10078.	0.000
		20	0.707	-0.045	10454.	0.000
		21	0.691	-0.017	10813.	0.000
		22	0.675	-0.021	11155.	0.000
		23	0.662	0.048	11485.	0.000
		24	0.648	-0.025	11802.	0.000
		25	0.637	0.053	12109.	0.000
		26	0.627	0.040	12407.	0.000
		27	0.619	0.035	12698.	0.000
		28	0.609	-0.019	12979.	0.000
		29	0.596	-0.042	13250.	0.000
		30	0.584	0.017	13509.	0.000

Figure 3: Correlogram for the Series

Figure 3.1.11 for Latin America:

Correlogram of Brazil_04

Date: 06/07/03 Time: 13:42
Sample: 1 753
Included observations: 751



	AC	PAC	Q-Stat	Prob
1	0.978	0.978	721.51	0.000
2	0.962	0.126	1420.7	0.000
3	0.947	0.019	2098.4	0.000
4	0.931	-0.003	2754.9	0.000
5	0.914	-0.059	3387.6	0.000
6	0.898	0.029	3999.7	0.000
7	0.884	0.038	4593.6	0.000
8	0.868	-0.034	5167.5	0.000
9	0.852	-0.029	5720.7	0.000
10	0.843	0.148	6262.8	0.000
11	0.830	-0.045	6789.5	0.000
12	0.817	-0.018	7300.7	0.000
13	0.804	-0.012	7796.5	0.000
14	0.791	-0.027	8277.2	0.000
15	0.779	0.015	8743.1	0.000
16	0.764	-0.047	9192.1	0.000
17	0.748	-0.065	9622.9	0.000
18	0.732	-0.005	10037.	0.000
19	0.719	0.061	10436.	0.000
20	0.705	-0.014	10820.	0.000
21	0.692	0.029	11191.	0.000
22	0.680	-0.001	11550.	0.000
23	0.668	-0.001	11897.	0.000
24	0.657	0.014	12232.	0.000
25	0.645	-0.006	12557.	0.000
26	0.635	0.001	12871.	0.000
27	0.624	-0.007	13175.	0.000
28	0.616	0.070	13472.	0.000
29	0.605	-0.048	13758.	0.000
30	0.595	0.016	14036.	0.000

Figure 3: Correlogram for the Series

Figure 3.1.12 for Latin America:

Correlogram of Brazil_09

Date: 06/07/03 Time: 13:48
Sample: 1 753
Included observations: 648

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	0.988	0.988	636.01	0.000
		2	0.976	-0.043	1257.1	0.000
		3	0.963	-0.048	1862.1	0.000
		4	0.950	0.042	2452.5	0.000
		5	0.936	-0.076	3026.7	0.000
		6	0.922	-0.005	3584.8	0.000
		7	0.908	-0.008	4126.7	0.000
		8	0.896	0.056	4654.7	0.000
		9	0.884	0.017	5169.5	0.000
		10	0.873	0.032	5672.3	0.000
		11	0.863	0.069	6165.4	0.000
		12	0.854	-0.028	6648.4	0.000
		13	0.844	-0.018	7121.4	0.000
		14	0.836	0.027	7585.2	0.000
		15	0.825	-0.069	8038.5	0.000
		16	0.814	-0.057	8479.9	0.000
		17	0.800	-0.093	8907.3	0.000
		18	0.787	0.019	9321.0	0.000
		19	0.775	0.086	9723.2	0.000
		20	0.763	-0.008	10114.	0.000
		21	0.751	-0.012	10493.	0.000
		22	0.739	-0.007	10861.	0.000
		23	0.728	-0.012	11218.	0.000
		24	0.717	0.014	11564.	0.000
		25	0.706	-0.027	11901.	0.000
		26	0.695	0.034	12229.	0.000
		27	0.685	-0.053	12546.	0.000
		28	0.673	-0.048	12854.	0.000
		29	0.660	-0.016	13150.	0.000
		30	0.648	0.013	13436.	0.000

Figure 3: Correlogram for the Series

Figure 3.2.1 for East Asia:

Correlogram of China_04

Date: 06/07/03 Time: 03:41
Sample: 1 753
Included observations: 737

	AC	PAC	Q-Stat	Prob
1	0.945	0.945	661.31	0.000
2	0.915	0.202	1281.9	0.000
3	0.890	0.083	1869.4	0.000
4	0.861	-0.014	2420.2	0.000
5	0.833	-0.006	2937.0	0.000
6	0.814	0.068	3430.8	0.000
7	0.788	-0.042	3893.6	0.000
8	0.765	0.015	4331.2	0.000
9	0.747	0.029	4748.3	0.000
10	0.728	0.021	5145.7	0.000
11	0.714	0.040	5527.8	0.000
12	0.697	-0.015	5892.4	0.000
13	0.677	-0.034	6236.7	0.000
14	0.658	-0.010	6562.8	0.000
15	0.639	-0.010	6870.9	0.000
16	0.622	0.009	7162.8	0.000
17	0.599	-0.054	7434.5	0.000
18	0.578	-0.024	7687.3	0.000
19	0.558	0.008	7923.9	0.000
20	0.544	0.049	8149.0	0.000
21	0.527	-0.010	8360.6	0.000
22	0.513	0.009	8561.4	0.000
23	0.495	-0.038	8748.6	0.000
24	0.480	0.011	8924.9	0.000
25	0.460	-0.058	9086.5	0.000
26	0.440	-0.030	9234.8	0.000
27	0.422	0.004	9371.5	0.000
28	0.400	-0.046	9494.7	0.000
29	0.382	0.018	9606.9	0.000
30	0.360	-0.046	9706.9	0.000

Figure 3: Correlogram for the Series

Figure 3.2.2 for East Asia:

Correlogram of Phil_10

Date: 06/07/03 Time: 04:21
Sample: 1 753
Included observations: 530

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	0.979	0.979	510.49	0.000
		2	0.957	-0.025	999.26	0.000
		3	0.937	0.040	1468.9	0.000
		4	0.917	-0.012	1919.8	0.000
		5	0.897	-0.025	2351.6	0.000
		6	0.878	0.039	2766.5	0.000
		7	0.860	0.000	3165.5	0.000
		8	0.842	-0.012	3548.6	0.000
		9	0.824	0.004	3916.4	0.000
		10	0.808	0.029	4270.8	0.000
		11	0.796	0.084	4615.4	0.000
		12	0.785	0.024	4951.2	0.000
		13	0.775	0.000	5278.4	0.000
		14	0.764	0.001	5597.1	0.000
		15	0.754	0.014	5908.2	0.000
		16	0.743	-0.007	6211.3	0.000
		17	0.732	-0.034	6505.5	0.000
		18	0.720	-0.005	6790.8	0.000
		19	0.708	0.004	7067.7	0.000
		20	0.697	0.010	7336.5	0.000
		21	0.685	-0.036	7596.1	0.000
		22	0.671	-0.018	7846.1	0.000
		23	0.656	-0.048	8085.4	0.000
		24	0.643	0.033	8315.5	0.000
		25	0.630	0.003	8536.9	0.000
		26	0.616	-0.036	8748.9	0.000
		27	0.602	-0.005	8951.9	0.000
		28	0.588	-0.015	9146.1	0.000
		29	0.574	-0.004	9331.8	0.000
		30	0.560	-0.012	9508.9	0.000

Figure 3: Correlogram for the Series

Figure 3.2.3 for East Asia:

Correlogram of Phil_PDI

Date: 06/07/03 Time: 04:23
Sample: 1 753
Included observations: 751

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	0.973	0.973	713.63	0.000
		2	0.956	0.179	1403.7	0.000
		3	0.942	0.078	2074.2	0.000
		4	0.929	0.058	2728.3	0.000
		5	0.917	0.012	3365.5	0.000
		6	0.905	0.020	3987.3	0.000
		7	0.899	0.114	4601.5	0.000
		8	0.891	0.022	5206.2	0.000
		9	0.880	-0.053	5796.8	0.000
		10	0.867	-0.068	6370.1	0.000
		11	0.859	0.073	6933.7	0.000
		12	0.848	-0.019	7484.6	0.000
		13	0.838	0.004	8023.2	0.000
		14	0.823	-0.107	8543.1	0.000
		15	0.811	-0.002	9048.7	0.000
		16	0.798	-0.033	9539.0	0.000
		17	0.784	-0.024	10012.	0.000
		18	0.771	0.000	10471.	0.000
		19	0.757	-0.023	10914.	0.000
		20	0.745	-0.015	11344.	0.000
		21	0.731	-0.019	11758.	0.000
		22	0.721	0.055	12161.	0.000
		23	0.710	0.012	12553.	0.000
		24	0.698	-0.036	12932.	0.000
		25	0.686	0.007	13298.	0.000
		26	0.673	-0.031	13651.	0.000
		27	0.661	0.013	13992.	0.000
		28	0.647	-0.020	14319.	0.000
		29	0.633	-0.032	14633.	0.000
		30	0.620	-0.008	14934.	0.000

Figure 3: Correlogram for the Series

Figure 3.2.4 for East Asia:

Correlogram of Kor_08

Date: 06/07/03 Time: 04:26
Sample: 1 753
Included observations: 752

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	0.981	0.981	726.70	0.000
		2	0.970	0.191	1437.5	0.000
		3	0.959	0.065	2134.3	0.000
		4	0.949	0.022	2817.4	0.000
		5	0.940	0.033	3488.5	0.000
		6	0.931	-0.006	4146.8	0.000
		7	0.920	-0.031	4791.1	0.000
		8	0.910	0.006	5422.6	0.000
		9	0.901	0.013	6042.2	0.000
		10	0.892	0.002	6649.9	0.000
		11	0.884	0.033	7247.5	0.000
		12	0.875	0.001	7834.6	0.000
		13	0.865	-0.063	8408.1	0.000
		14	0.857	0.065	8972.9	0.000
		15	0.851	0.061	9530.6	0.000
		16	0.842	-0.070	10077.	0.000
		17	0.834	0.009	10614.	0.000
		18	0.824	-0.051	11139.	0.000
		19	0.817	0.049	11656.	0.000
		20	0.809	-0.017	12163.	0.000
		21	0.802	0.016	12661.	0.000
		22	0.795	0.027	13151.	0.000
		23	0.788	0.019	13635.	0.000
		24	0.780	-0.033	14109.	0.000
		25	0.772	-0.043	14574.	0.000
		26	0.763	-0.037	15028.	0.000
		27	0.755	0.043	15474.	0.000
		28	0.748	0.004	15912.	0.000
		29	0.738	-0.053	16340.	0.000
		30	0.730	0.001	16758.	0.000

Figure 3: Correlogram for the Series

Figure 3.2.5 for East Asia:

Correlogram of KDB_72506

Date: 06/07/03 Time: 04:29
Sample: 1 753
Included observations: 721

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	0.968	0.968	678.82	0.000
		2	0.948	0.165	1330.3	0.000
		3	0.933	0.117	1962.6	0.000
		4	0.918	0.029	2575.7	0.000
		5	0.903	0.004	3169.4	0.000
		6	0.891	0.053	3748.3	0.000
		7	0.878	-0.010	4310.5	0.000
		8	0.862	-0.026	4854.3	0.000
		9	0.850	0.020	5382.8	0.000
		10	0.837	0.008	5896.8	0.000
		11	0.826	0.027	6397.9	0.000
		12	0.819	0.071	6890.9	0.000
		13	0.811	0.019	7375.1	0.000
		14	0.804	0.031	7851.4	0.000
		15	0.797	0.011	8319.8	0.000
		16	0.789	0.004	8780.3	0.000
		17	0.777	-0.073	9227.4	0.000
		18	0.768	0.009	9664.5	0.000
		19	0.761	0.039	10095.	0.000
		20	0.754	0.006	10517.	0.000
		21	0.749	0.063	10935.	0.000
		22	0.745	0.035	11350.	0.000
		23	0.742	0.045	11761.	0.000
		24	0.736	-0.025	12167.	0.000
		25	0.729	-0.028	12565.	0.000
		26	0.721	-0.048	12955.	0.000
		27	0.714	0.009	13338.	0.000
		28	0.707	-0.022	13714.	0.000
		29	0.697	-0.042	14080.	0.000
		30	0.688	-0.008	14437.	0.000

Figure 3: Correlogram for the Series

Figure 3.2.6 for East Asia:

Correlogram of THAI_07

Date: 06/07/03 Time: 05:23
Sample: 1 753
Included observations: 720

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	0.963	0.963	670.46	0.000
		2	0.939	0.166	1309.3	0.000
		3	0.919	0.063	1921.2	0.000
		4	0.901	0.056	2510.9	0.000
		5	0.893	0.144	3090.4	0.000
		6	0.886	0.091	3662.6	0.000
		7	0.878	0.020	4225.1	0.000
		8	0.865	-0.051	4771.7	0.000
		9	0.860	0.111	5312.2	0.000
		10	0.846	-0.073	5836.2	0.000
		11	0.839	0.059	6351.8	0.000
		12	0.827	-0.050	6854.2	0.000
		13	0.817	0.023	7345.6	0.000
		14	0.806	-0.029	7824.5	0.000
		15	0.797	0.014	8292.5	0.000
		16	0.788	0.006	8751.4	0.000
		17	0.776	-0.043	9196.2	0.000
		18	0.767	0.008	9631.6	0.000
		19	0.757	0.016	10056.	0.000
		20	0.748	-0.011	10471.	0.000
		21	0.741	0.048	10880.	0.000
		22	0.739	0.075	11287.	0.000
		23	0.735	0.015	11690.	0.000
		24	0.726	-0.049	12084.	0.000
		25	0.720	0.016	12472.	0.000
		26	0.708	-0.042	12847.	0.000
		27	0.702	0.048	13217.	0.000
		28	0.698	0.026	13583.	0.000
		29	0.692	-0.011	13944.	0.000
		30	0.686	-0.012	14298.	0.000

Figure 3: Correlogram for the Series

Figure 3.3.1 for East Europe:

Correlogram of RUS_03

Date: 06/07/03 Time: 05:26
Sample: 1 753
Included observations: 713

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	0.976	0.976	681.97	0.000
		2	0.961	0.181	1344.2	0.000
		3	0.947	0.052	1988.5	0.000
		4	0.934	0.013	2615.1	0.000
		5	0.923	0.074	3229.0	0.000
		6	0.918	0.125	3836.1	0.000
		7	0.908	-0.033	4431.4	0.000
		8	0.898	-0.014	5015.1	0.000
		9	0.890	0.014	5588.2	0.000
		10	0.878	-0.050	6146.8	0.000
		11	0.869	0.056	6695.8	0.000
		12	0.864	0.076	7239.1	0.000
		13	0.857	-0.009	7774.2	0.000
		14	0.850	-0.017	8300.8	0.000
		15	0.843	0.009	8819.8	0.000
		16	0.836	0.040	9331.5	0.000
		17	0.830	0.023	9836.7	0.000
		18	0.824	-0.016	10335.	0.000
		19	0.818	0.004	10827.	0.000
		20	0.811	-0.025	11311.	0.000
		21	0.803	-0.028	11785.	0.000
		22	0.797	0.041	12253.	0.000
		23	0.790	-0.004	12714.	0.000
		24	0.784	0.003	13168.	0.000
		25	0.780	0.040	13619.	0.000
		26	0.771	-0.070	14060.	0.000
		27	0.765	0.041	14495.	0.000
		28	0.760	0.007	14925.	0.000
		29	0.753	-0.005	15347.	0.000
		30	0.747	-0.001	15764.	0.000

Figure 3: Correlogram for the Series

Figure 3.3.2 for East Europe:

Correlogram of RUS_07

Date: 06/07/03 Time: 05:29
Sample: 1 753
Included observations: 715

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	0.974	0.974	681.15	0.000
		2	0.959	0.200	1342.3	0.000
		3	0.947	0.092	1987.4	0.000
		4	0.934	0.030	2616.8	0.000
		5	0.925	0.071	3234.6	0.000
		6	0.921	0.134	3847.8	0.000
		7	0.913	0.001	4452.0	0.000
		8	0.905	-0.008	5046.4	0.000
		9	0.897	-0.011	5630.5	0.000
		10	0.886	-0.052	6200.9	0.000
		11	0.879	0.064	6763.3	0.000
		12	0.874	0.069	7320.9	0.000
		13	0.865	-0.068	7867.7	0.000
		14	0.861	0.067	8409.9	0.000
		15	0.855	-0.008	8945.3	0.000
		16	0.849	0.035	9474.3	0.000
		17	0.844	0.008	9996.9	0.000
		18	0.837	-0.016	10513.	0.000
		19	0.832	0.022	11023.	0.000
		20	0.825	-0.026	11525.	0.000
		21	0.819	0.003	12021.	0.000
		22	0.814	0.021	12511.	0.000
		23	0.807	-0.037	12993.	0.000
		24	0.800	-0.012	13468.	0.000
		25	0.796	0.057	13938.	0.000
		26	0.787	-0.091	14399.	0.000
		27	0.780	0.030	14853.	0.000
		28	0.774	-0.005	15300.	0.000
		29	0.769	0.025	15741.	0.000
		30	0.763	0.000	16176.	0.000

Figure 3: Correlogram for the Series

Figure 3.3.3 for East Europe:

Correlogram of RUS_10

Date: 06/07/03 Time: 05:32
Sample: 1 753
Included observations: 540

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	0.968	0.968	509.18	0.000
		2	0.957	0.304	1007.0	0.000
		3	0.946	0.115	1494.4	0.000
		4	0.935	0.044	1971.5	0.000
		5	0.922	-0.011	2437.0	0.000
		6	0.911	0.001	2891.9	0.000
		7	0.901	0.017	3337.4	0.000
		8	0.891	0.017	3773.9	0.000
		9	0.881	0.013	4201.8	0.000
		10	0.872	0.019	4621.8	0.000
		11	0.865	0.039	5035.6	0.000
		12	0.863	0.125	5448.5	0.000
		13	0.848	-0.164	5847.6	0.000
		14	0.845	0.111	6245.3	0.000
		15	0.836	-0.054	6634.6	0.000
		16	0.825	-0.065	7014.5	0.000
		17	0.814	-0.020	7385.5	0.000
		18	0.805	-0.009	7748.5	0.000
		19	0.795	0.003	8103.5	0.000
		20	0.786	0.018	8451.2	0.000
		21	0.778	0.021	8792.3	0.000
		22	0.770	0.018	9127.2	0.000
		23	0.760	-0.033	9454.3	0.000
		24	0.751	-0.045	9774.0	0.000
		25	0.748	0.160	10092.	0.000
		26	0.731	-0.272	10396.	0.000
		27	0.721	0.044	10692.	0.000
		28	0.711	0.001	10981.	0.000
		29	0.701	0.005	11263.	0.000
		30	0.689	-0.025	11535.	0.000

Figure 3: Correlogram for the Series

Figure 3.3.4 for East Europe:

Correlogram of Pol_04

Date: 06/07/03 Time: 05:33
Sample: 1 753
Included observations: 707

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	0.851	0.851	514.74	0.000
		2	0.828	0.374	1002.1	0.000
		3	0.786	0.112	1442.5	0.000
		4	0.773	0.132	1868.2	0.000
		5	0.745	0.049	2264.8	0.000
		6	0.752	0.151	2669.3	0.000
		7	0.735	0.053	3056.2	0.000
		8	0.718	0.001	3426.1	0.000
		9	0.698	-0.004	3775.5	0.000
		10	0.684	0.013	4112.3	0.000
		11	0.674	0.038	4439.5	0.000
		12	0.674	0.064	4767.2	0.000
		13	0.661	0.005	5083.3	0.000
		14	0.660	0.040	5398.2	0.000
		15	0.627	-0.081	5683.3	0.000
		16	0.614	-0.020	5957.0	0.000
		17	0.610	0.055	6227.3	0.000
		18	0.611	0.050	6498.9	0.000
		19	0.600	0.001	6761.0	0.000
		20	0.600	0.022	7023.8	0.000
		21	0.602	0.065	7288.6	0.000
		22	0.582	-0.033	7536.7	0.000
		23	0.576	0.003	7779.6	0.000
		24	0.566	-0.008	8015.0	0.000
		25	0.567	0.032	8251.6	0.000
		26	0.540	-0.086	8466.3	0.000
		27	0.547	0.043	8686.7	0.000
		28	0.527	-0.024	8892.1	0.000
		29	0.528	0.033	9098.4	0.000
		30	0.519	0.013	9297.8	0.000

Figure 3: Correlogram for the Series

Figure 3.3.5 for East Europe:

Correlogram of Pol_17

Date: 06/07/03 Time: 05:34
Sample: 1 753
Included observations: 713

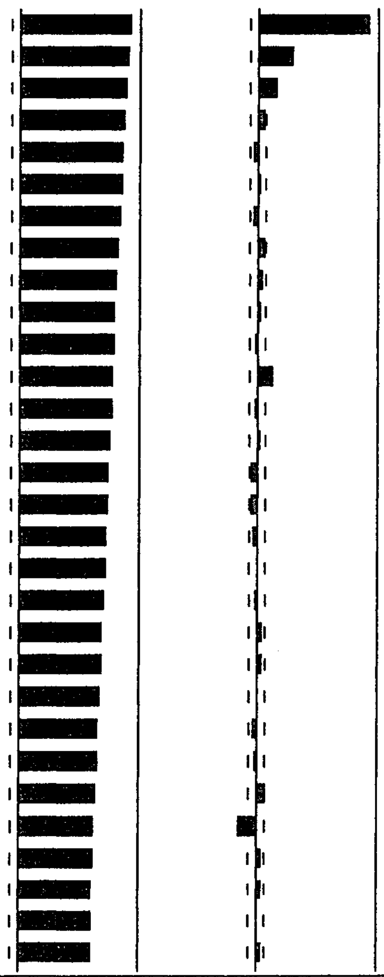
Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	0.934	0.934	624.41	0.000
		2	0.913	0.321	1222.2	0.000
		3	0.895	0.138	1796.7	0.000
		4	0.876	0.056	2348.4	0.000
		5	0.860	0.044	2881.0	0.000
		6	0.851	0.081	3402.7	0.000
		7	0.840	0.044	3911.7	0.000
		8	0.829	0.024	4408.1	0.000
		9	0.812	-0.033	4885.9	0.000
		10	0.805	0.046	5355.4	0.000
		11	0.799	0.060	5818.6	0.000
		12	0.792	0.037	6274.7	0.000
		13	0.788	0.043	6726.7	0.000
		14	0.789	0.080	7180.6	0.000
		15	0.784	0.019	7629.4	0.000
		16	0.777	-0.008	8071.1	0.000
		17	0.774	0.027	8509.8	0.000
		18	0.763	-0.041	8937.3	0.000
		19	0.763	0.063	9365.4	0.000
		20	0.753	-0.034	9783.1	0.000
		21	0.750	0.019	10197.	0.000
		22	0.744	0.008	10606.	0.000
		23	0.734	-0.029	11004.	0.000
		24	0.723	-0.035	11391.	0.000
		25	0.719	0.026	11774.	0.000
		26	0.713	0.023	12151.	0.000
		27	0.712	0.050	12528.	0.000
		28	0.710	0.026	12904.	0.000
		29	0.712	0.044	13281.	0.000
		30	0.708	0.000	13655.	0.000

Figure 3: Correlogram for the Series

Figure 3.3.6 for East Europe:

Correlogram of Pol_PBS_09

Date: 06/07/03 Time: 05:35
Sample: 1 753
Included observations: 630



Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	0.954	0.954	576.57	0.000
		2	0.937	0.291	1133.0	0.000
		3	0.925	0.162	1676.2	0.000
		4	0.910	0.042	2203.1	0.000
		5	0.892	-0.026	2710.5	0.000
		6	0.879	0.015	3203.0	0.000
		7	0.861	-0.035	3677.0	0.000
		8	0.850	0.050	4139.3	0.000
		9	0.838	0.030	4589.6	0.000
		10	0.826	0.012	5027.6	0.000
		11	0.812	-0.020	5451.4	0.000
		12	0.810	0.130	5874.1	0.000
		13	0.799	-0.023	6285.6	0.000
		14	0.791	0.023	6689.7	0.000
		15	0.779	-0.050	7082.2	0.000
		16	0.766	-0.047	7462.7	0.000
		17	0.753	-0.027	7831.2	0.000
		18	0.742	-0.002	8189.8	0.000
		19	0.728	-0.021	8535.1	0.000
		20	0.719	0.036	8872.1	0.000
		21	0.710	0.039	9201.8	0.000
		22	0.699	-0.007	9522.1	0.000
		23	0.687	-0.025	9831.3	0.000
		24	0.677	-0.016	10132.	0.000
		25	0.671	0.064	10428.	0.000
		26	0.652	-0.148	10709.	0.000
		27	0.643	0.036	10982.	0.000
		28	0.635	0.030	11249.	0.000
		29	0.625	0.008	11507.	0.000
		30	0.617	0.040	11760.	0.000

Figure 3: Correlogram for the Series

Figure 3.3.7 for East Europe:

Correlogram of Hung_06

Date: 06/07/03 Time: 13:40
Sample: 1 753
Included observations: 414

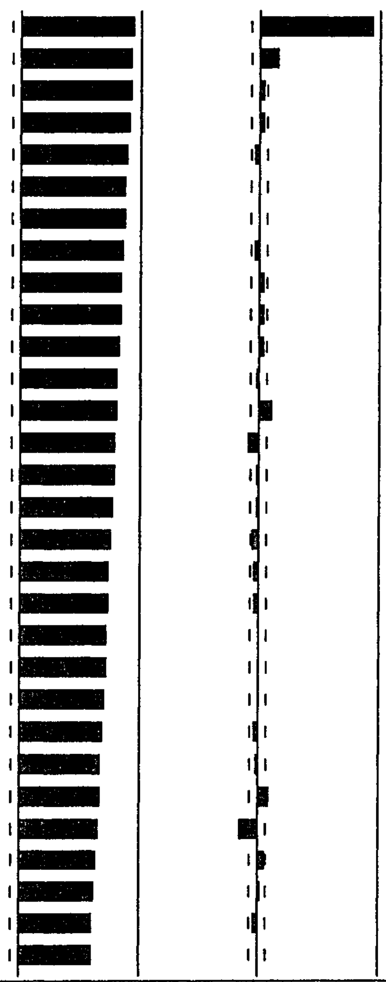
Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	0.935	0.935	364.32	0.000
		2	0.904	0.241	706.03	0.000
		3	0.878	0.096	1029.2	0.000
		4	0.857	0.066	1337.4	0.000
		5	0.834	0.018	1630.2	0.000
		6	0.820	0.078	1914.1	0.000
		7	0.802	0.004	2186.0	0.000
		8	0.783	-0.003	2446.1	0.000
		9	0.767	0.018	2696.3	0.000
		10	0.751	0.009	2936.9	0.000
		11	0.734	-0.005	3167.4	0.000
		12	0.736	0.150	3399.4	0.000
		13	0.729	0.018	3627.4	0.000
		14	0.723	0.026	3852.3	0.000
		15	0.714	-0.005	4072.1	0.000
		16	0.707	0.016	4288.5	0.000
		17	0.701	0.033	4501.7	0.000
		18	0.691	-0.027	4709.6	0.000
		19	0.683	0.002	4913.1	0.000
		20	0.674	-0.001	5111.9	0.000
		21	0.664	-0.019	5304.9	0.000
		22	0.651	-0.023	5491.1	0.000
		23	0.633	-0.048	5667.7	0.000
		24	0.623	0.016	5839.0	0.000
		25	0.619	0.068	6008.4	0.000
		26	0.599	-0.108	6167.7	0.000
		27	0.584	-0.023	6319.2	0.000
		28	0.576	0.052	6467.5	0.000
		29	0.568	0.010	6611.7	0.000
		30	0.558	0.002	6751.4	0.000

Figure 3: Correlogram for the Series

Figure 3.3.8 for East Europe:

Correlogram of Bulgaria_IAB11

Date: 06/07/03 Time: 13:50
Sample: 1 753
Included observations: 749



Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	0.979	0.979	720.82	0.000
		2	0.965	0.154	1421.9	0.000
		3	0.951	0.030	2104.1	0.000
		4	0.939	0.033	2769.4	0.000
		5	0.925	-0.025	3416.3	0.000
		6	0.912	0.001	4045.9	0.000
		7	0.899	-0.002	4658.3	0.000
		8	0.885	-0.033	5252.5	0.000
		9	0.873	0.040	5831.6	0.000
		10	0.862	0.040	6397.4	0.000
		11	0.852	0.028	6951.1	0.000
		12	0.841	-0.022	7491.1	0.000
		13	0.835	0.100	8023.5	0.000
		14	0.824	-0.082	8542.6	0.000
		15	0.813	-0.013	9049.3	0.000
		16	0.802	-0.017	9543.2	0.000
		17	0.790	-0.048	10023.	0.000
		18	0.777	-0.030	10488.	0.000
		19	0.764	-0.025	10938.	0.000
		20	0.751	-0.003	11374.	0.000
		21	0.739	0.004	11795.	0.000
		22	0.726	-0.006	12203.	0.000
		23	0.712	-0.027	12596.	0.000
		24	0.699	-0.012	12975.	0.000
		25	0.689	0.089	13344.	0.000
		26	0.674	-0.149	13698.	0.000
		27	0.662	0.044	14039.	0.000
		28	0.650	0.012	14369.	0.000
		29	0.637	-0.040	14686.	0.000
		30	0.624	0.001	14991.	0.000

Figure 3: Correlogram for the Series

Figure 3.3.9 for East Europe:

Correlogram of Bulgaria_FLI12

Date: 12/29/03 Time: 03:23
Sample: 1 753
Included observations: 749

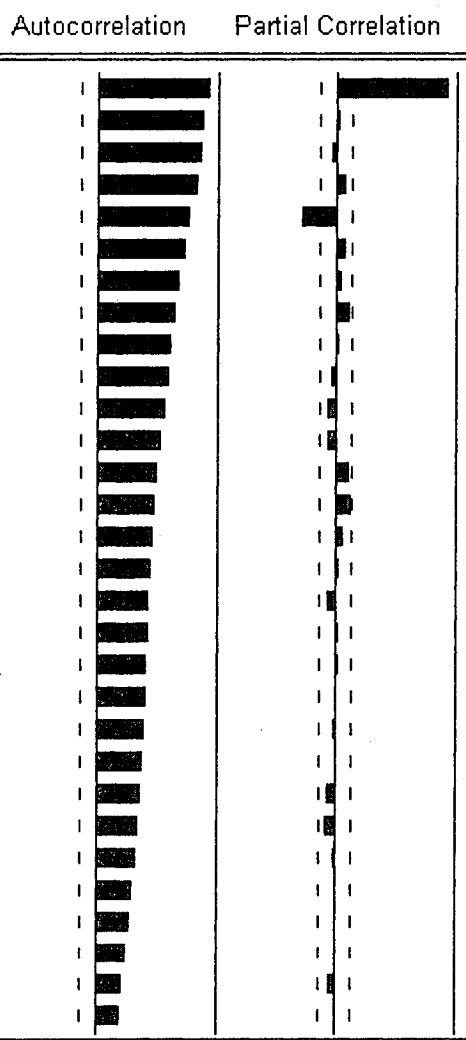
Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	0.978	0.978	719.98	0.000
		2	0.965	0.167	1420.5	0.000
		3	0.949	-0.003	2100.1	0.000
		4	0.936	0.024	2761.3	0.000
		5	0.922	0.004	3404.2	0.000
		6	0.909	-0.004	4029.1	0.000
		7	0.896	0.015	4637.5	0.000
		8	0.882	-0.018	5228.4	0.000
		9	0.870	0.025	5804.2	0.000
		10	0.860	0.037	6366.6	0.000
		11	0.849	0.012	6916.1	0.000
		12	0.839	0.014	7453.6	0.000
		13	0.834	0.126	7985.7	0.000
		14	0.824	-0.091	8505.3	0.000
		15	0.814	-0.029	9013.4	0.000
		16	0.804	-0.007	9509.5	0.000
		17	0.793	-0.043	9992.3	0.000
		18	0.780	-0.044	10460.	0.000
		19	0.768	0.001	10915.	0.000
		20	0.756	-0.010	11356.	0.000
		21	0.744	0.001	11783.	0.000
		22	0.731	-0.006	12197.	0.000
		23	0.719	-0.027	12597.	0.000
		24	0.706	0.003	12984.	0.000
		25	0.698	0.099	13363.	0.000
		26	0.681	-0.215	13724.	0.000
		27	0.669	0.044	14073.	0.000
		28	0.657	0.041	14410.	0.000
		29	0.645	-0.049	14734.	0.000
		30	0.631	-0.021	15046.	0.000

Figure 3: Correlogram for the Series

Figure 3.4.1 for Africa:

Correlogram of Egypt_06

Date: 06/07/03 Time: 04:14
Sample: 1 753
Included observations: 217



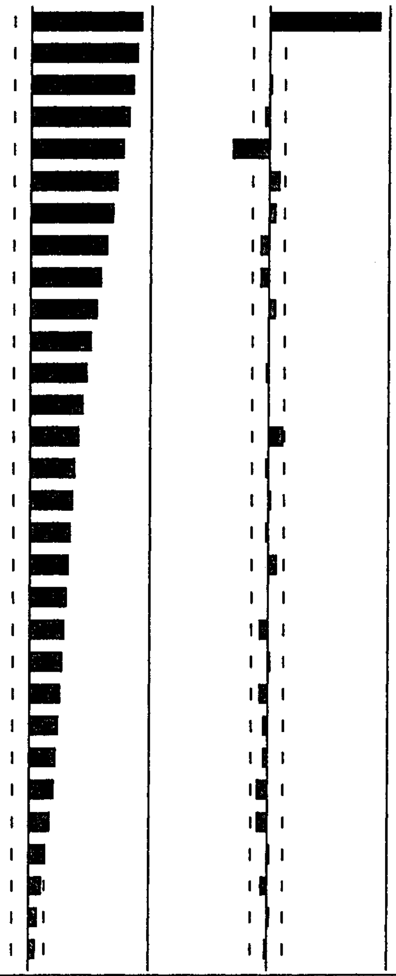
	AC	PAC	Q-Stat	Prob
1	0.957	0.957	201.60	0.000
2	0.918	0.020	387.83	0.000
3	0.878	-0.026	559.02	0.000
4	0.846	0.068	718.56	0.000
5	0.789	-0.300	858.16	0.000
6	0.743	0.080	982.38	0.000
7	0.700	0.029	1093.1	0.000
8	0.671	0.112	1195.4	0.000
9	0.636	0.009	1287.8	0.000
10	0.605	-0.038	1371.7	0.000
11	0.569	-0.071	1446.4	0.000
12	0.535	-0.079	1512.8	0.000
13	0.507	0.101	1572.6	0.000
14	0.489	0.124	1628.5	0.000
15	0.472	0.055	1680.8	0.000
16	0.456	0.013	1730.0	0.000
17	0.441	-0.075	1776.1	0.000
18	0.433	0.019	1820.9	0.000
19	0.425	0.011	1864.3	0.000
20	0.414	-0.001	1905.7	0.000
21	0.398	-0.014	1944.1	0.000
22	0.385	-0.005	1980.2	0.000
23	0.369	-0.058	2013.5	0.000
24	0.348	-0.098	2043.3	0.000
25	0.323	-0.016	2069.1	0.000
26	0.300	0.001	2091.5	0.000
27	0.275	-0.005	2110.4	0.000
28	0.249	-0.001	2126.0	0.000
29	0.221	-0.055	2138.4	0.000
30	0.197	-0.004	2148.2	0.000

Figure 3: Correlogram for the Series

Figure 3.4.2 for Africa:

Correlogram of Egypt_11

Date: 06/07/03 Time: 04:18
Sample: 1 753
Included observations: 209



Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	0.962	0.962	196.39	0.000
		2	0.926	-0.003	379.10	0.000
		3	0.892	0.012	549.43	0.000
		4	0.857	-0.036	707.24	0.000
		5	0.800	-0.308	845.48	0.000
		6	0.752	0.094	968.46	0.000
		7	0.711	0.045	1078.8	0.000
		8	0.666	-0.060	1176.1	0.000
		9	0.612	-0.075	1258.7	0.000
		10	0.569	0.049	1330.4	0.000
		11	0.530	0.005	1393.0	0.000
		12	0.488	-0.023	1446.2	0.000
		13	0.445	-0.001	1490.7	0.000
		14	0.418	0.119	1530.2	0.000
		15	0.391	-0.015	1565.0	0.000
		16	0.365	0.020	1595.4	0.000
		17	0.339	-0.013	1621.8	0.000
		18	0.327	0.059	1646.5	0.000
		19	0.313	-0.004	1669.2	0.000
		20	0.294	-0.067	1689.3	0.000
		21	0.278	0.019	1707.4	0.000
		22	0.264	-0.077	1723.9	0.000
		23	0.246	-0.028	1738.2	0.000
		24	0.223	-0.034	1750.0	0.000
		25	0.198	-0.090	1759.5	0.000
		26	0.170	-0.091	1766.4	0.000
		27	0.140	0.016	1771.1	0.000
		28	0.106	-0.047	1773.9	0.000
		29	0.076	0.024	1775.3	0.000
		30	0.044	-0.019	1775.8	0.000

Figure 3: Correlogram for the Series

Figure 3.4.3 for Africa:

Correlogram of Israel_10

Date: 06/07/03 Time: 04:55
Sample: 1 753
Included observations: 539

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	0.946	0.946	485.21	0.000
		2	0.905	0.094	929.96	0.000
		3	0.875	0.102	1346.7	0.000
		4	0.855	0.109	1745.6	0.000
		5	0.829	-0.038	2120.5	0.000
		6	0.804	0.018	2473.8	0.000
		7	0.775	-0.039	2803.5	0.000
		8	0.751	0.013	3113.5	0.000
		9	0.725	-0.031	3402.5	0.000
		10	0.703	0.025	3674.7	0.000
		11	0.687	0.063	3935.3	0.000
		12	0.675	0.054	4187.7	0.000
		13	0.662	0.012	4430.3	0.000
		14	0.649	0.027	4664.4	0.000
		15	0.632	-0.037	4887.0	0.000
		16	0.623	0.051	5103.4	0.000
		17	0.612	-0.007	5312.6	0.000
		18	0.604	0.032	5517.1	0.000
		19	0.599	0.049	5718.5	0.000
		20	0.587	-0.060	5912.1	0.000
		21	0.576	0.022	6098.8	0.000
		22	0.567	0.005	6280.0	0.000
		23	0.560	0.022	6457.0	0.000
		24	0.553	0.018	6630.4	0.000
		25	0.541	-0.047	6796.7	0.000
		26	0.523	-0.062	6952.4	0.000
		27	0.511	0.026	7101.3	0.000
		28	0.497	-0.030	7242.6	0.000
		29	0.491	0.070	7380.3	0.000
		30	0.484	0.020	7514.7	0.000

Figure 3: Correlogram for the Series

Figure 3.4.4 for Africa:

Correlogram of IsraelE_06

Date: 06/07/03 Time: 04:57
Sample: 1 753
Included observations: 734

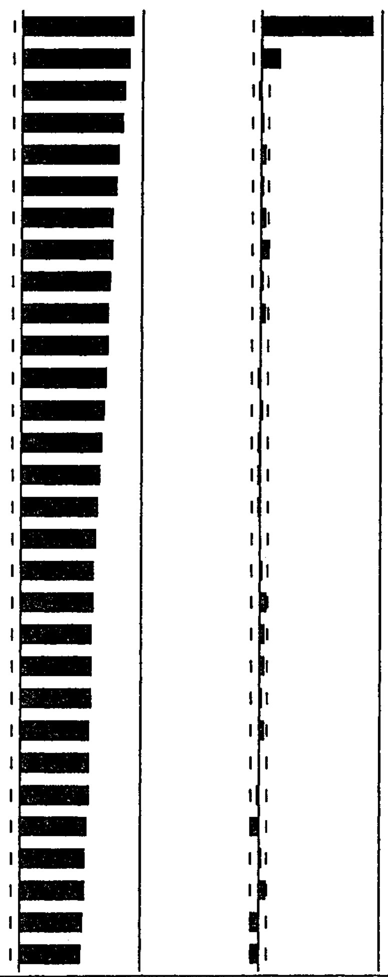
Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	0.968	0.968	689.91	0.000
		2	0.947	0.166	1351.3	0.000
		3	0.930	0.082	1989.9	0.000
		4	0.920	0.149	2616.9	0.000
		5	0.908	-0.003	3227.4	0.000
		6	0.896	0.025	3823.1	0.000
		7	0.877	-0.101	4394.8	0.000
		8	0.863	0.019	4948.7	0.000
		9	0.848	-0.006	5485.1	0.000
		10	0.832	-0.062	6001.3	0.000
		11	0.819	0.049	6502.0	0.000
		12	0.807	0.024	6989.0	0.000
		13	0.790	-0.058	7457.2	0.000
		14	0.776	0.015	7909.2	0.000
		15	0.761	-0.025	8344.1	0.000
		16	0.748	0.019	8764.6	0.000
		17	0.735	0.004	9171.4	0.000
		18	0.727	0.085	9570.5	0.000
		19	0.711	-0.097	9952.0	0.000
		20	0.695	-0.037	10317.	0.000
		21	0.679	-0.018	10666.	0.000
		22	0.665	-0.006	11002.	0.000
		23	0.655	0.053	11327.	0.000
		24	0.645	0.013	11644.	0.000
		25	0.632	-0.001	11948.	0.000
		26	0.614	-0.096	12235.	0.000
		27	0.600	0.012	12510.	0.000
		28	0.588	0.028	12775.	0.000
		29	0.579	0.043	13032.	0.000
		30	0.568	-0.018	13280.	0.000

Figure 3: Correlogram for the Series

Figure 3.4.5 for Africa:

Correlogram of SOAF_06

Date: 06/07/03 Time: 05:16
Sample: 1 753
Included observations: 717



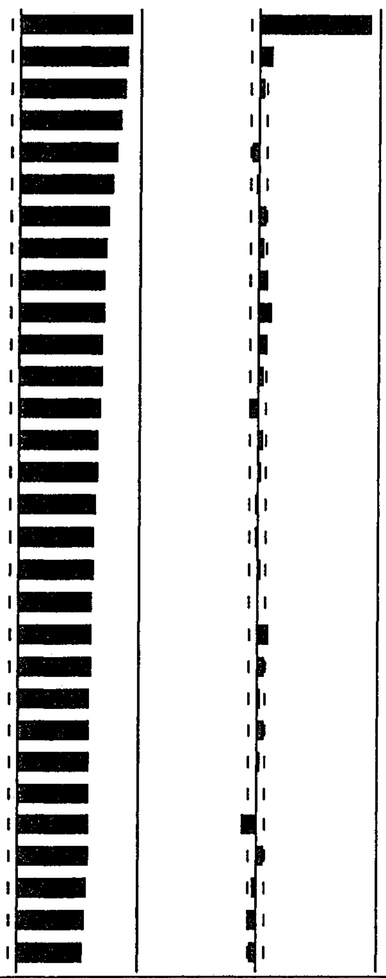
	AC	PAC	Q-Stat	Prob
1	0.954	0.954	655.97	0.000
2	0.924	0.148	1271.9	0.000
3	0.892	-0.012	1846.1	0.000
4	0.863	0.016	2384.2	0.000
5	0.837	0.039	2891.7	0.000
6	0.814	0.022	3371.7	0.000
7	0.794	0.040	3829.2	0.000
8	0.779	0.071	4270.9	0.000
9	0.765	0.022	4697.2	0.000
10	0.753	0.027	5110.7	0.000
11	0.740	0.007	5510.8	0.000
12	0.725	-0.021	5895.3	0.000
13	0.712	0.017	6266.3	0.000
14	0.696	-0.017	6621.6	0.000
15	0.679	-0.018	6960.6	0.000
16	0.663	-0.008	7283.6	0.000
17	0.646	-0.006	7591.0	0.000
18	0.632	0.014	7885.1	0.000
19	0.621	0.043	8169.9	0.000
20	0.612	0.029	8447.1	0.000
21	0.607	0.041	8719.7	0.000
22	0.602	0.020	8988.2	0.000
23	0.598	0.031	9254.0	0.000
24	0.593	-0.008	9515.4	0.000
25	0.585	-0.011	9770.8	0.000
26	0.571	-0.079	10014.	0.000
27	0.560	0.019	10248.	0.000
28	0.551	0.049	10475.	0.000
29	0.536	-0.072	10691.	0.000
30	0.520	-0.058	10894.	0.000

Figure 3: Correlogram for the Series

Figure 3.4.6 for Africa:

Correlogram of SOAF_09

Date: 06/07/03 Time: 05:21
Sample: 1 753
Included observations: 718



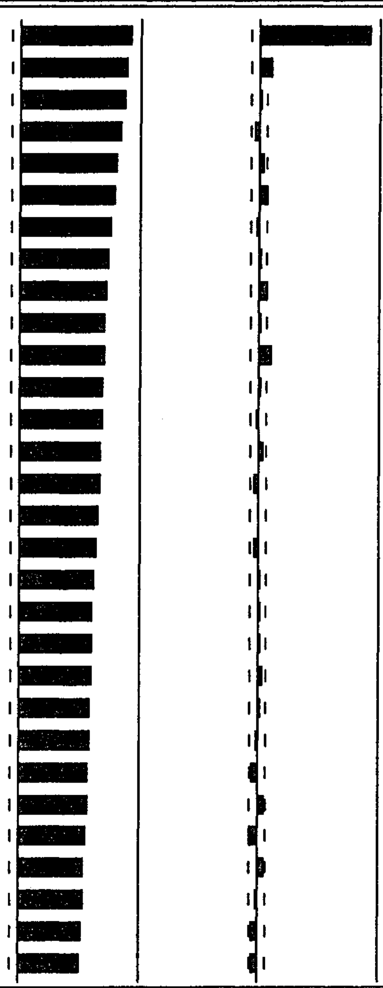
Autocorrelation / Partial Correlation	AC	PAC	Q-Stat	Prob
1	0.957	0.957	659.81	0.000
2	0.924	0.110	1276.9	0.000
3	0.895	0.034	1856.2	0.000
4	0.866	-0.004	2399.0	0.000
5	0.833	-0.051	2902.6	0.000
6	0.802	-0.016	3369.4	0.000
7	0.776	0.055	3807.8	0.000
8	0.753	0.026	4220.4	0.000
9	0.734	0.063	4613.5	0.000
10	0.723	0.099	4995.4	0.000
11	0.715	0.060	5369.6	0.000
12	0.709	0.029	5737.3	0.000
13	0.695	-0.069	6091.8	0.000
14	0.687	0.027	6438.0	0.000
15	0.678	0.017	6776.6	0.000
16	0.667	-0.016	7104.4	0.000
17	0.654	-0.013	7419.6	0.000
18	0.641	0.011	7723.0	0.000
19	0.628	0.000	8014.6	0.000
20	0.621	0.090	8300.4	0.000
21	0.617	0.057	8583.0	0.000
22	0.613	0.014	8862.6	0.000
23	0.614	0.056	9142.8	0.000
24	0.614	0.012	9423.6	0.000
25	0.613	-0.004	9704.3	0.000
26	0.603	-0.115	9976.3	0.000
27	0.600	0.044	10245.	0.000
28	0.590	-0.038	10506.	0.000
29	0.574	-0.069	10753.	0.000
30	0.554	-0.048	10984.	0.000

Figure 3: Correlogram for the Series

Figure 3.4.7 for Africa:

Correlogram of SOAF_17

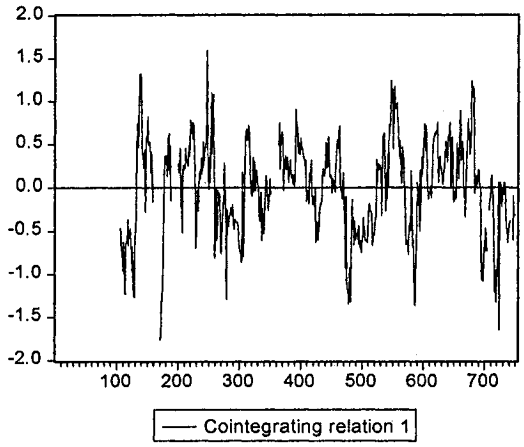
Date: 06/07/03 Time: 05:22
Sample: 1 753
Included observations: 718

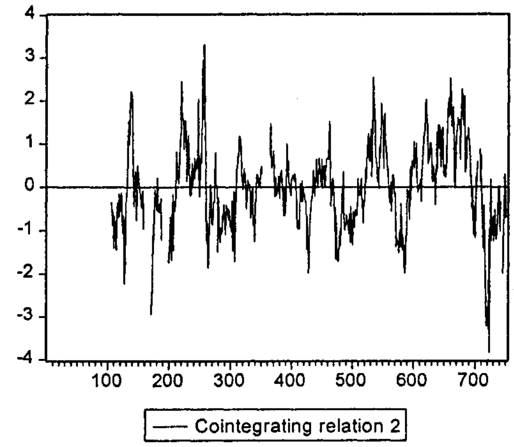


Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	0.958	0.958	662.19	0.000
		2	0.926	0.099	1282.0	0.000
		3	0.896	0.011	1862.2	0.000
		4	0.863	-0.037	2401.5	0.000
		5	0.835	0.038	2907.2	0.000
		6	0.814	0.075	3387.7	0.000
		7	0.789	-0.022	3840.7	0.000
		8	0.768	0.016	4269.9	0.000
		9	0.752	0.062	4682.0	0.000
		10	0.736	0.025	5077.7	0.000
		11	0.728	0.099	5465.6	0.000
		12	0.721	0.019	5845.9	0.000
		13	0.710	-0.023	6215.4	0.000
		14	0.702	0.033	6577.0	0.000
		15	0.690	-0.025	6927.4	0.000
		16	0.678	0.001	7266.0	0.000
		17	0.664	-0.035	7590.8	0.000
		18	0.651	0.016	7903.7	0.000
		19	0.639	0.022	8205.2	0.000
		20	0.627	0.012	8496.7	0.000
		21	0.619	0.037	8780.8	0.000
		22	0.611	0.013	9058.0	0.000
		23	0.602	-0.008	9327.9	0.000
		24	0.590	-0.044	9587.6	0.000
		25	0.584	0.051	9842.0	0.000
		26	0.570	-0.078	10085.	0.000
		27	0.562	0.046	10321.	0.000
		28	0.552	-0.011	10549.	0.000
		29	0.538	-0.044	10766.	0.000
		30	0.522	-0.043	10971.	0.000

Figure 4: Cointegrating Vectors for Risk Premium

Figure 4.1 for Latin America:
Series: arge_09, arge_frb, brazil_04, brazil_09, mex_05, mex_07, urug_03, urug_08, vene_07, vene_18





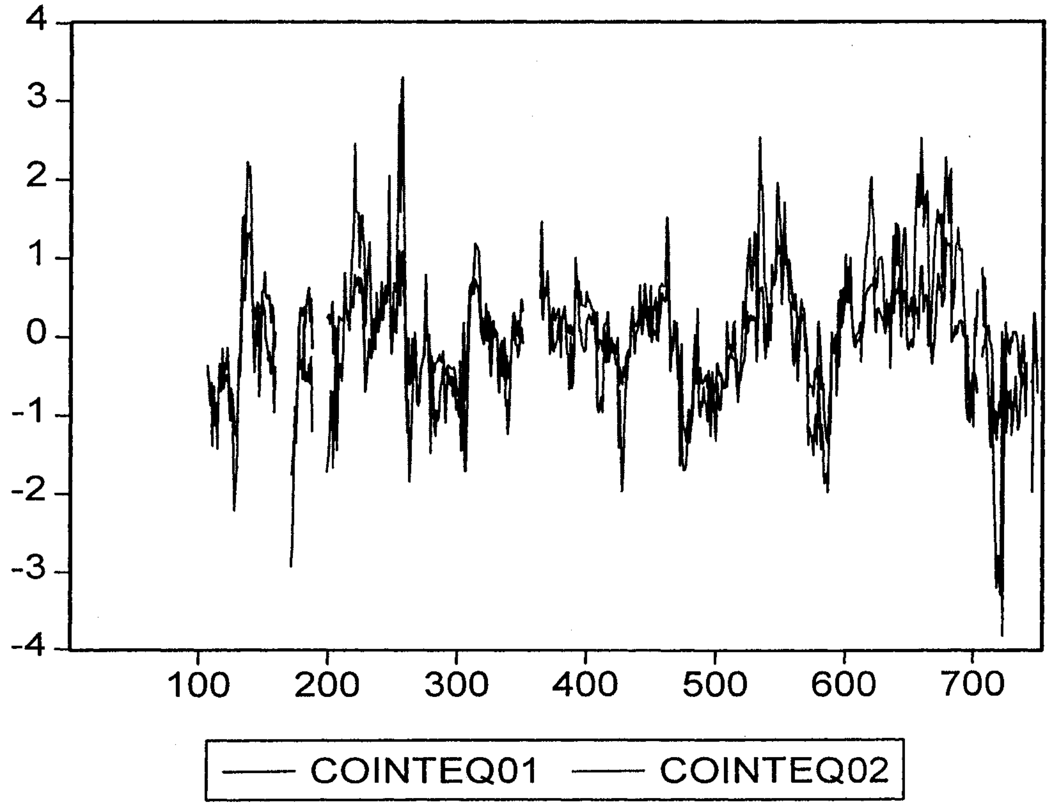


Figure 4: Cointegrating Vectors for Risk Premium

Figure 4.2 for East Asia:
Series: kdb_72506, kor_08, phil_10, phil_pdi

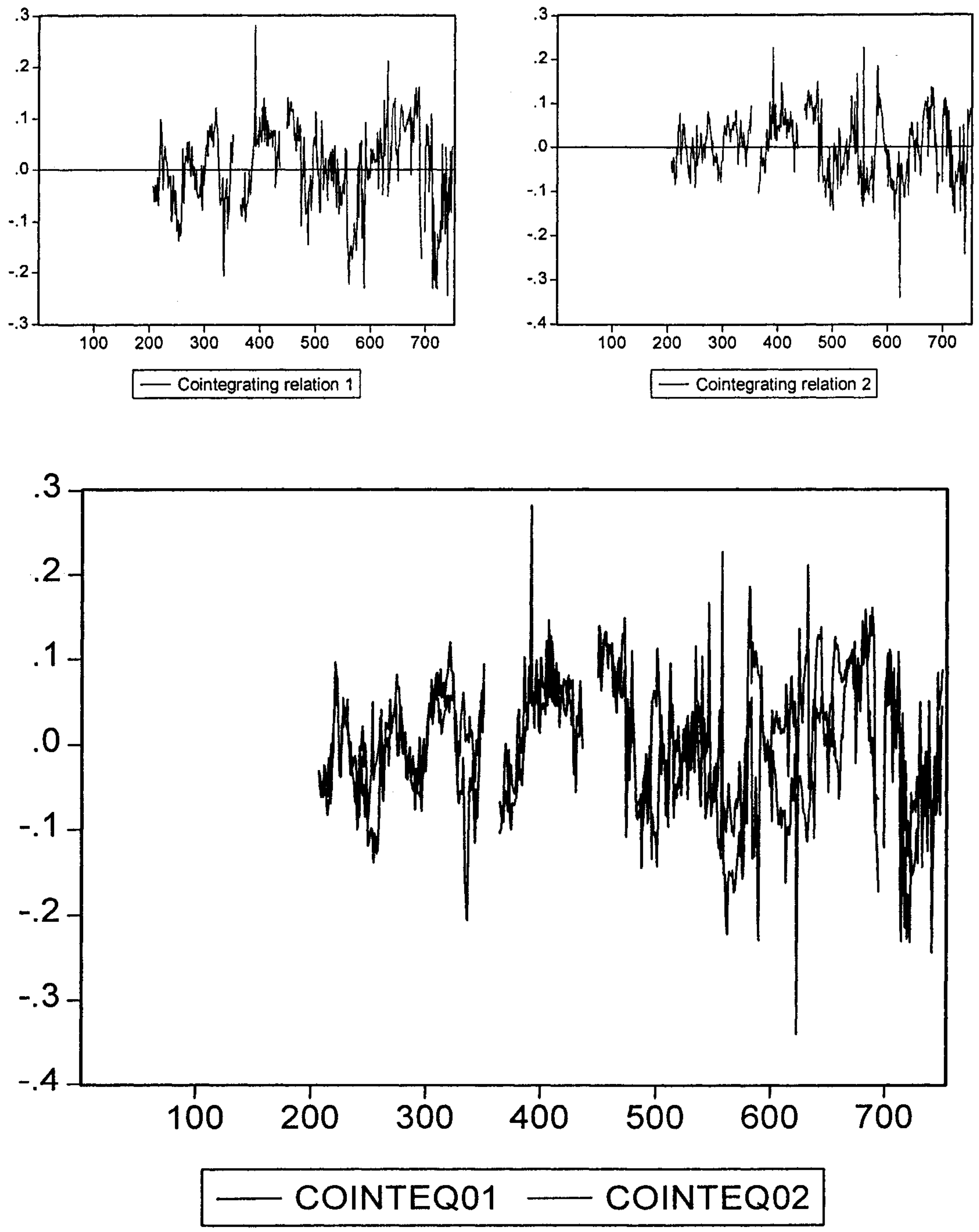
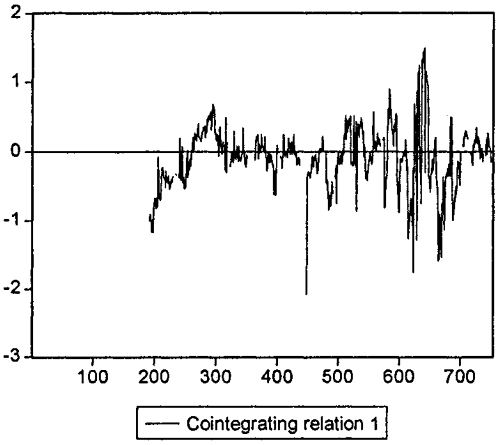
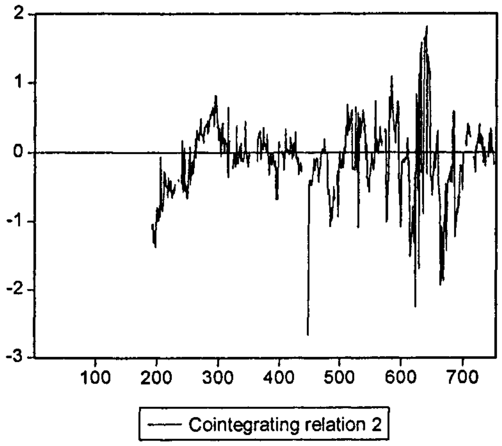


Figure 4: Cointegrating Vectors for Risk Premium

Figure 4.3 for East Europe:
Series: bulgaria_fli12, bulgaria_iab11, pol_04, pol_17, pol_pbs_09, rus_03, rus_07, rus_10





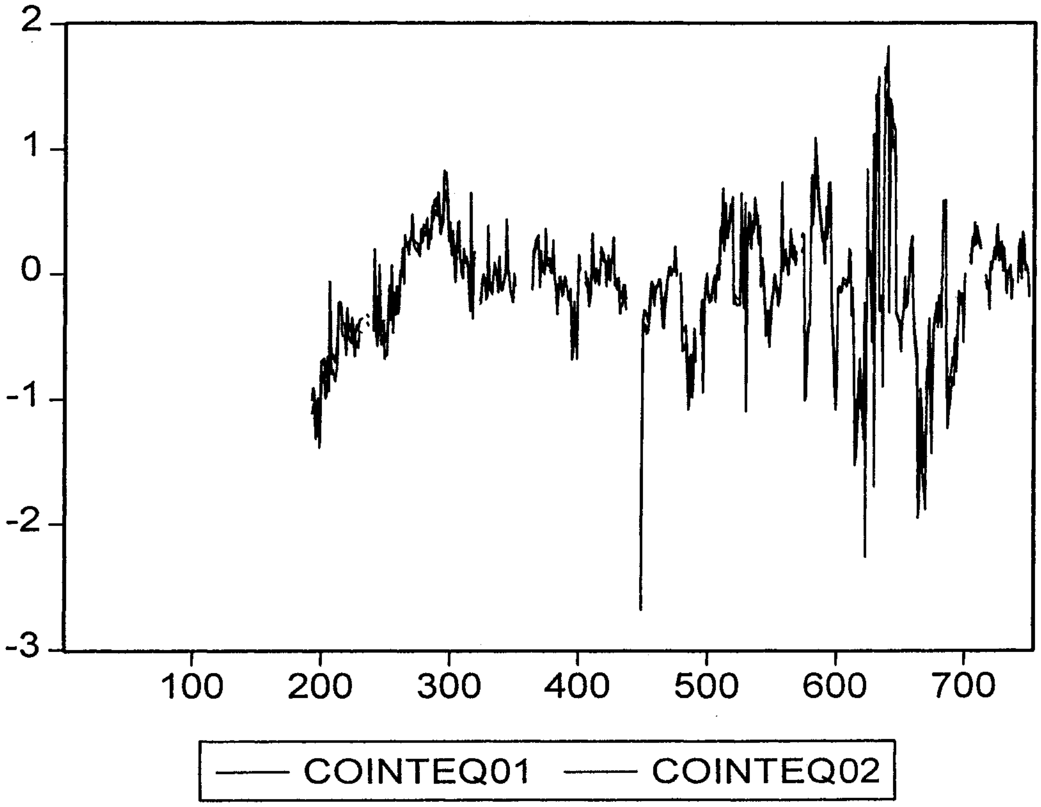
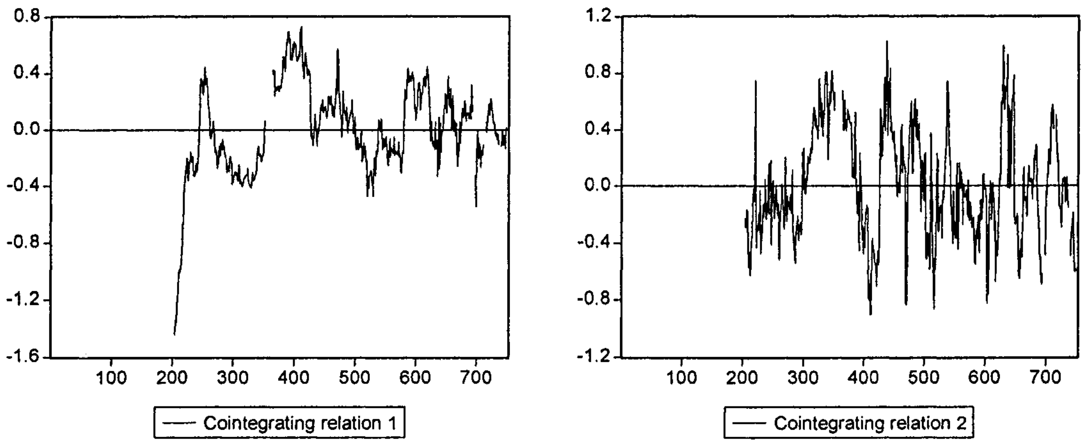


Figure 4: Cointegrating Vectors for Risk Premium

<u>Figure 4.4 for Africa</u>:
<u>Series:</u> israel_10, israele_06, soaf_06 and soaf_09



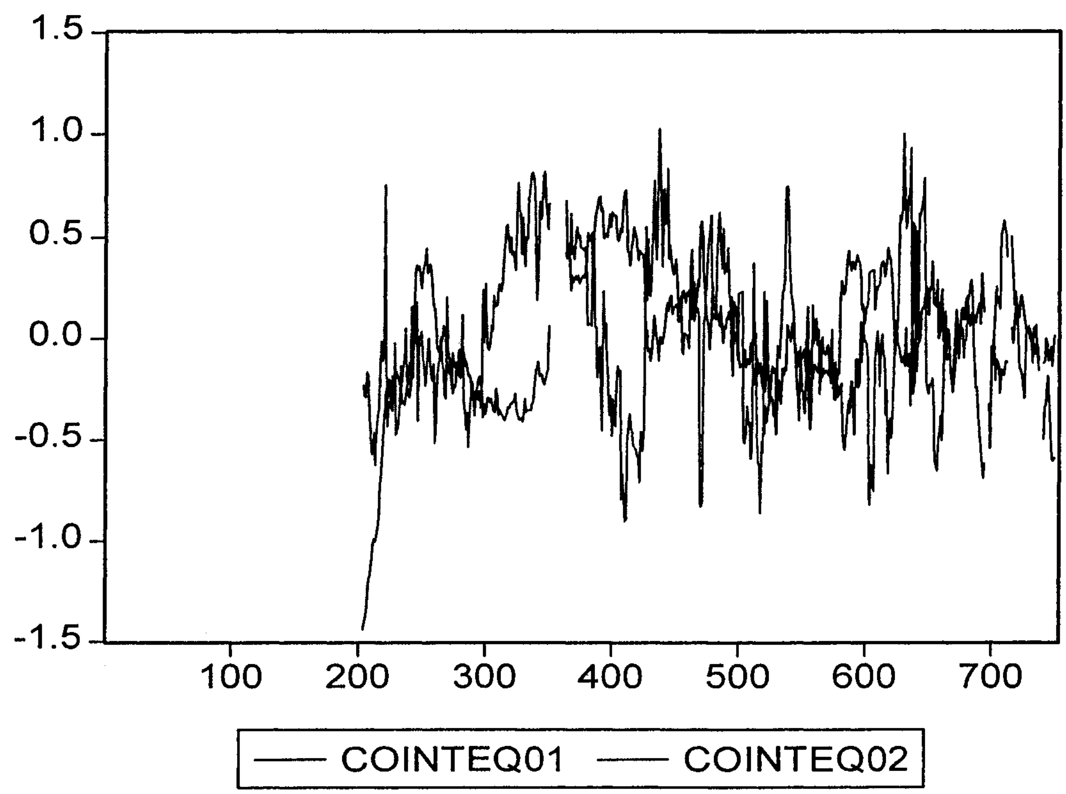


Figure 5: Autocorrelations with 2 Std.Err. Bounds (Correlograms)

Figure 5.1 for Latin America:
Series: arge_09 arge_frb brazil_04 brazil_09 mex_05 mex_07 urug_03 urug_08 vene_07 vene_18

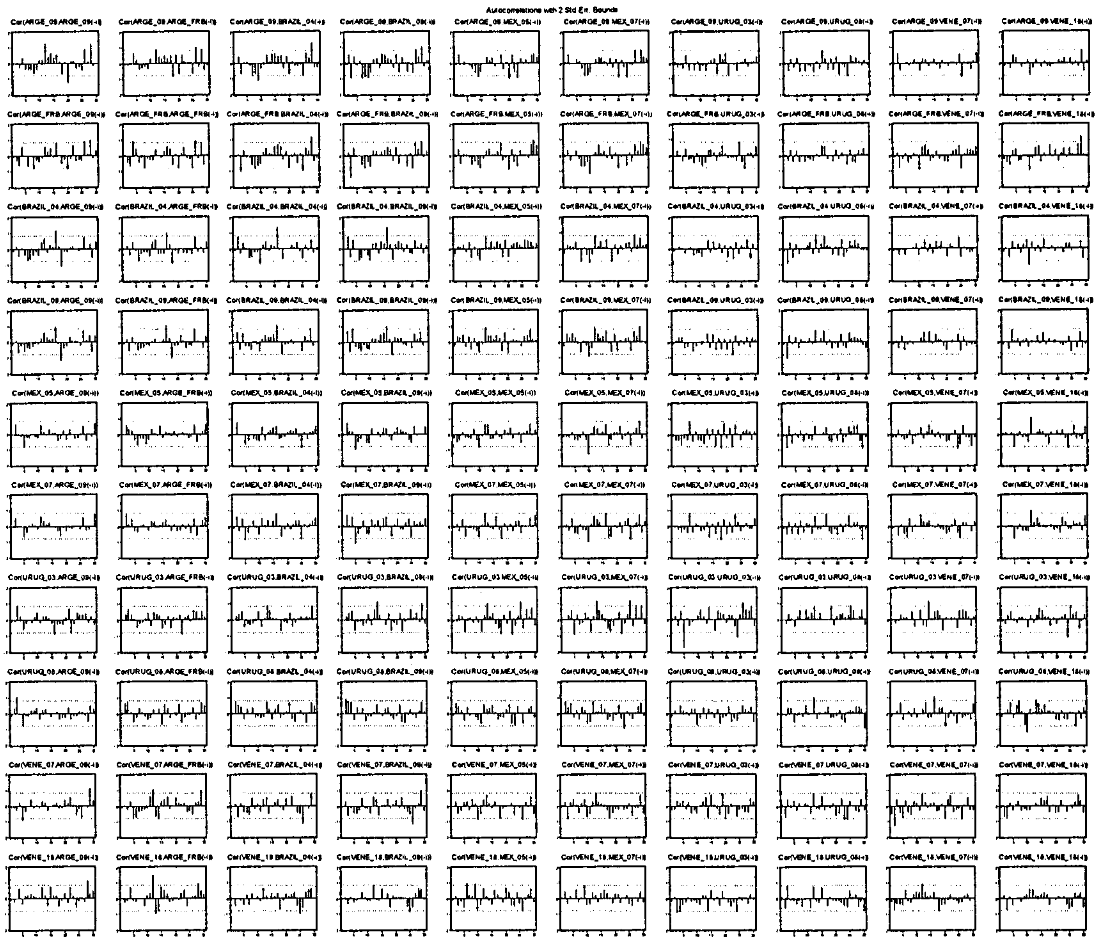


Figure 5: Autocorrelations with 2 Std.Err. Bounds (Correlograms)

Figure 5.2 for East Asia:
Series: kdb_72506 kor_08 phil_10 phil_pdi

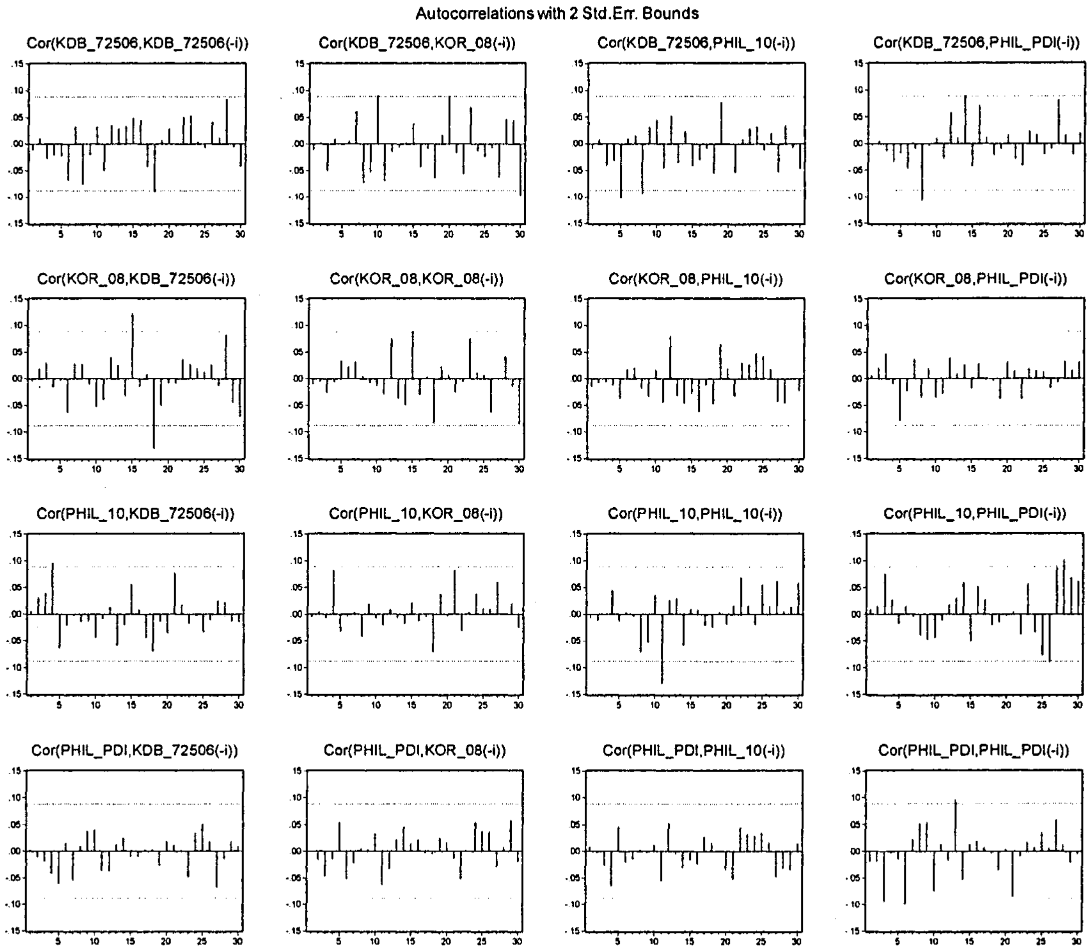


Figure 5: Autocorrelations with 2 Std.Err. Bounds (Correlograms)

Figure 5.3 for East Europe:
Series: bulgaria_fli12, bulgaria_iab11, pol_04, pol_17, pol_pbs_09, rus_03, rus_07, rus_10

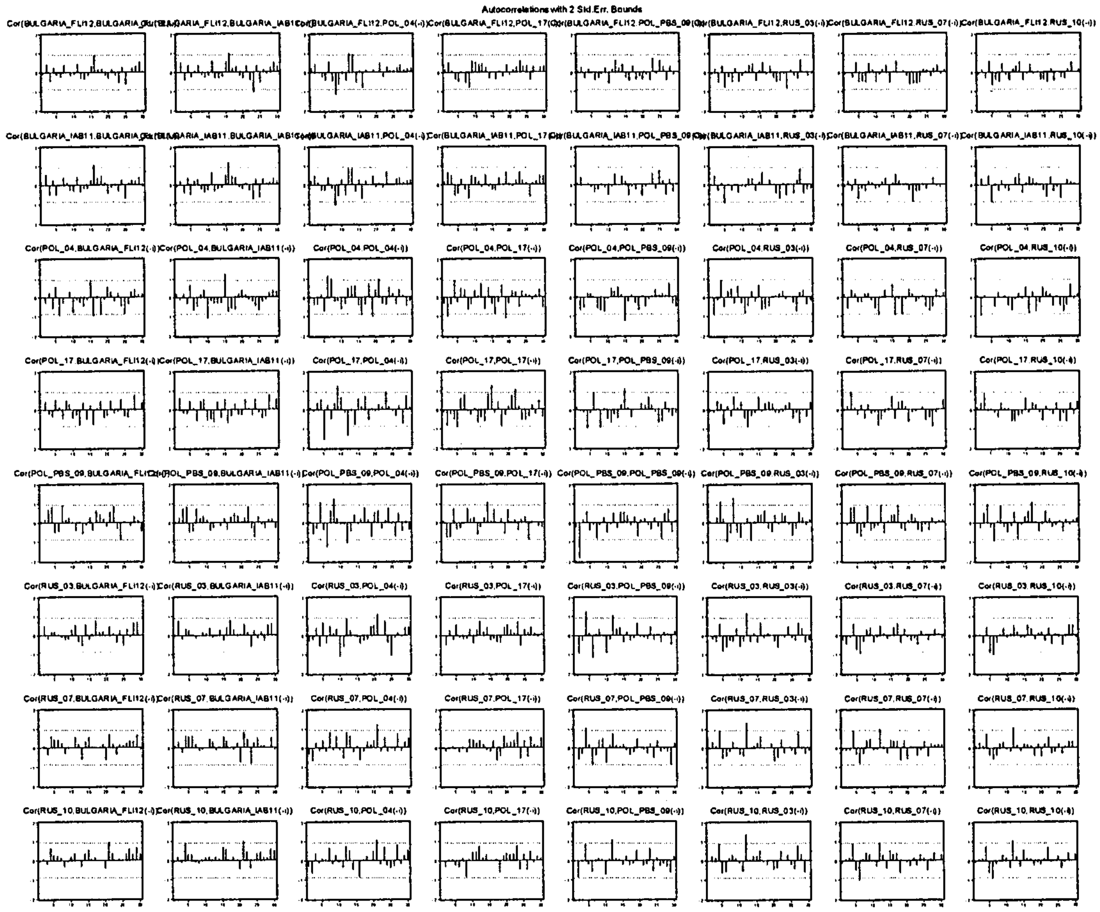


Figure 5: Autocorrelations with 2 Std.Err. Bounds (Correlograms)

Figure 5.4 for Africa:
Series: israel_10, israele_06, soaf_06 and soaf_09

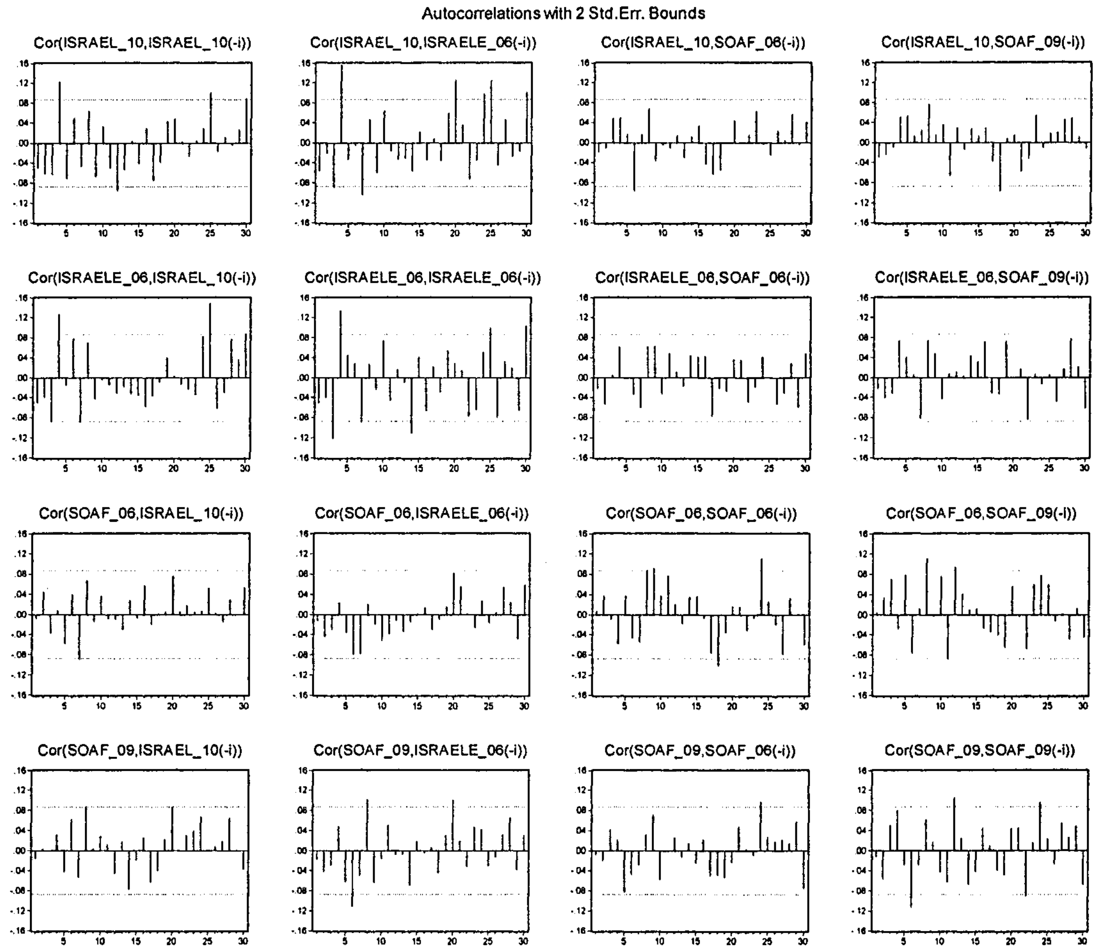


Figure 6: Residuals

Figure 6.1 for Latin America:
Series: arge_09, arge_frb, brazil_04, brazil_09, mex_05, mex_07, urug_03, urug_08, vene_07, vene_18

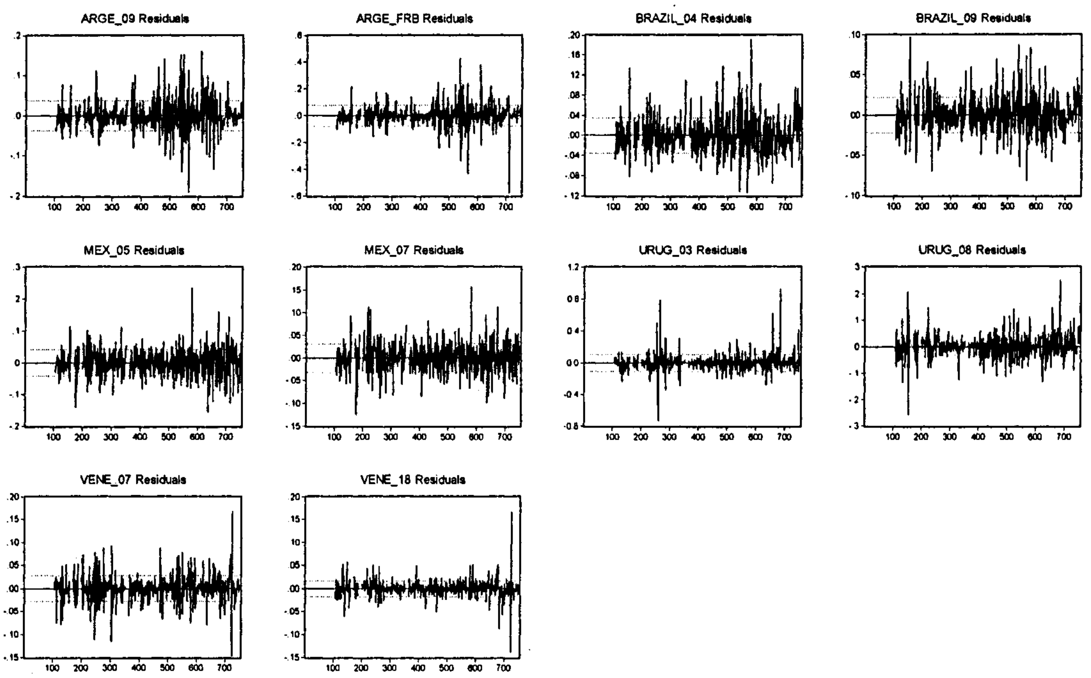


Figure 6: Residuals

Figure 6.2 for East Asia:
Series: kdb_72506, kor_08, phil_10, phil_pdi

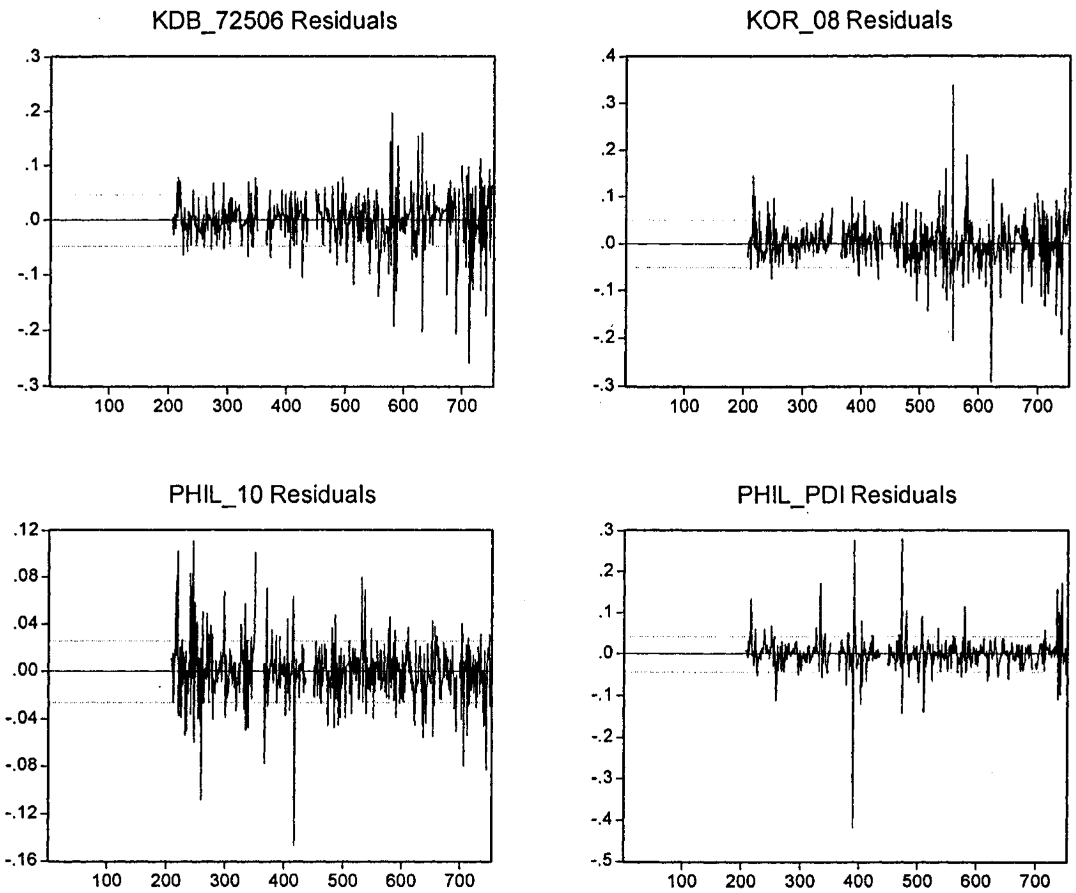


Figure 6: Residuals

Figure 6.3 for East Europe:
Series: bulgaria_fli12, bulgaria_iab11, pol_04, pol_17, pol_pbs_09, rus_03, rus_07, rus_10

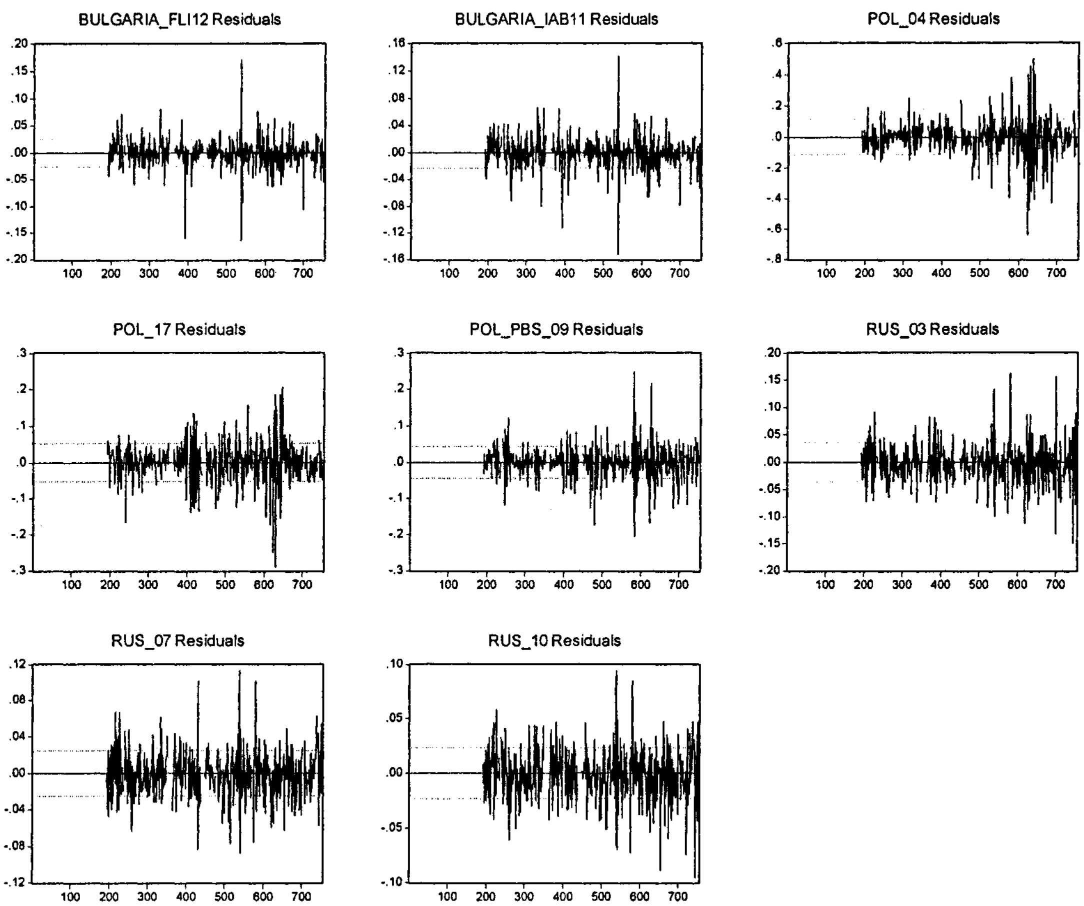


Figure 6: Residuals

Figure 6.4 for Africa:
Series: israel_10, israele_06, soaf_06 and soaf_09

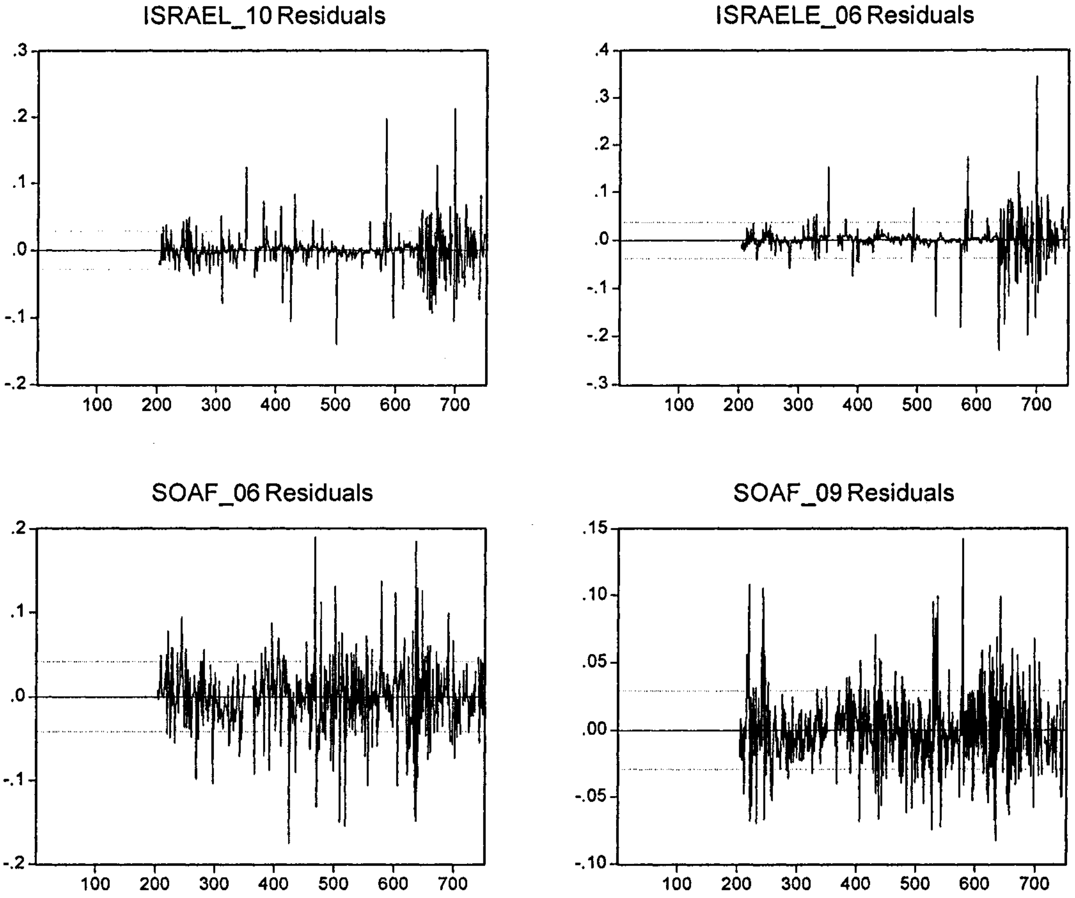


Figure 7: Impulse Responses

Figure 7.1.1 for Latin America: Impulse brazil_04

Responses to arge_09, brazil_04, brazil_09, mex_05 mex_07, urug_03, urug_08, vene_07 and vene_18

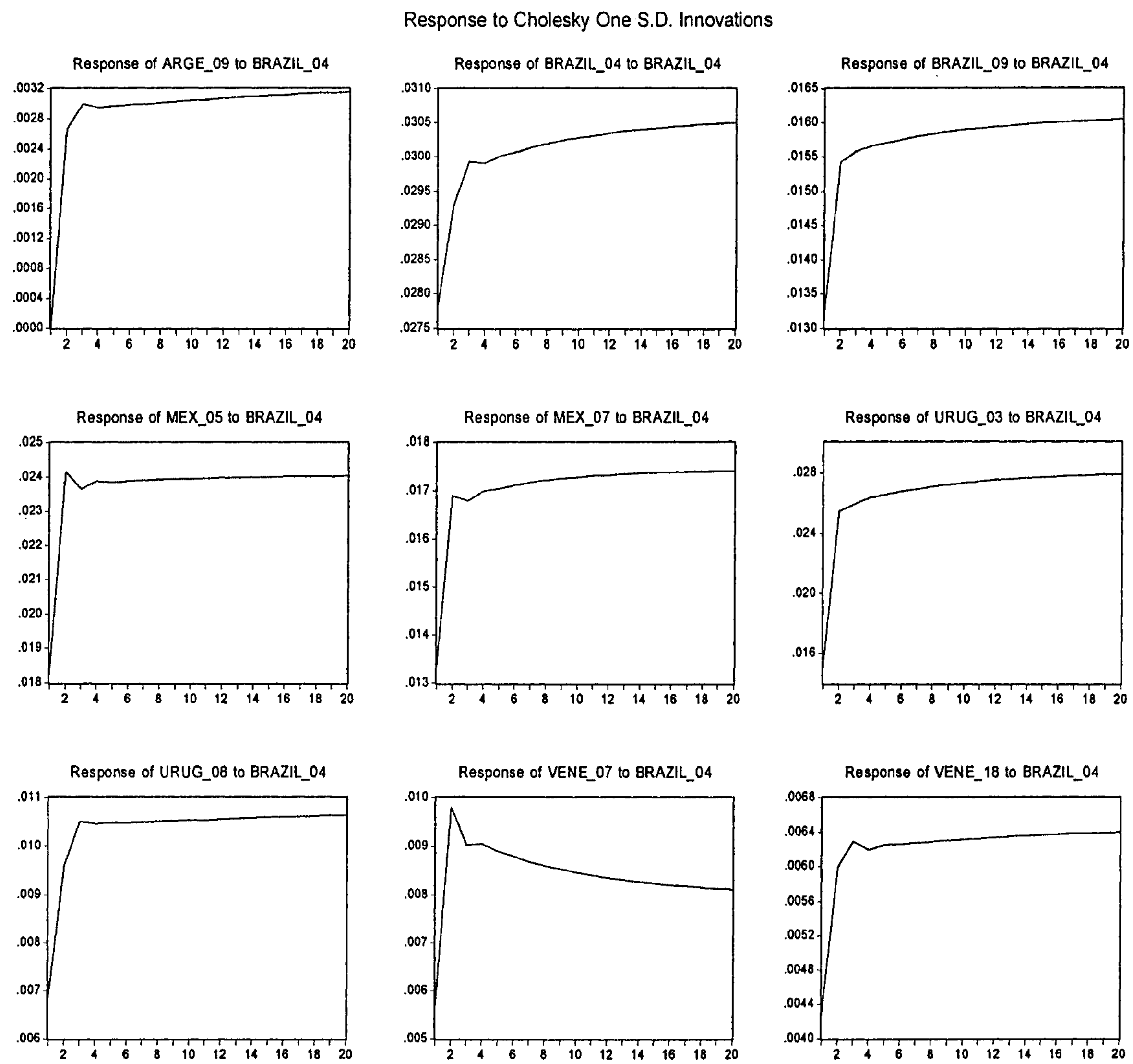


Figure 7: Impulse Responses

Figure 7.1.2 for Latin America: Impulse brazil_09

Responses to arge_09, brazil_04, brazil_09, mex_05, mex_07, urug_03, urug_08, vene_07 and vene_18

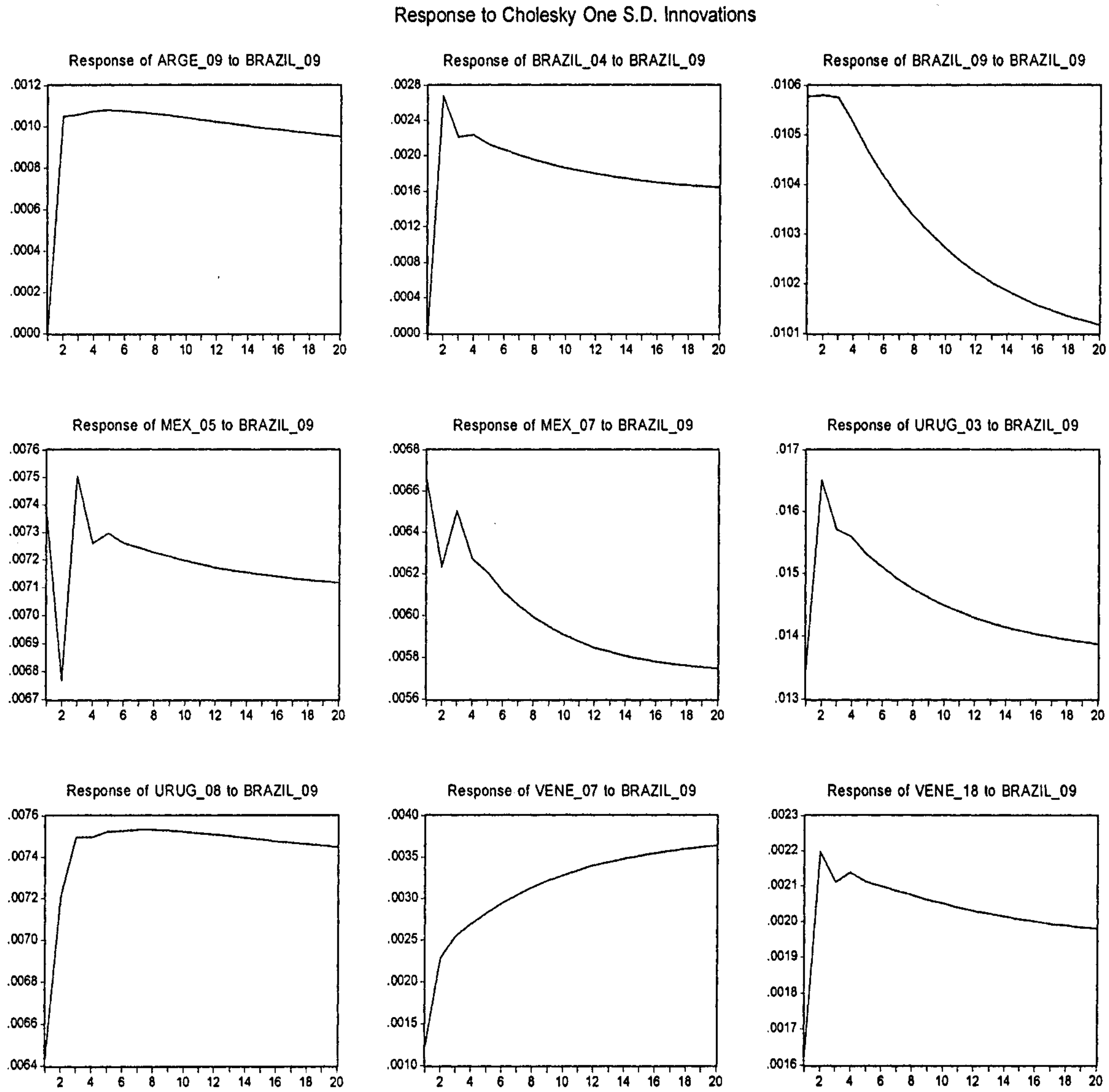


Figure 7: Impulse Responses

<u>Figure 7.1.3 for Latin America</u>: Impulse mex_05

Responses to brazil_04, brazil_09, mex_05, urug_03, urug_08, vene_07 and vene_18

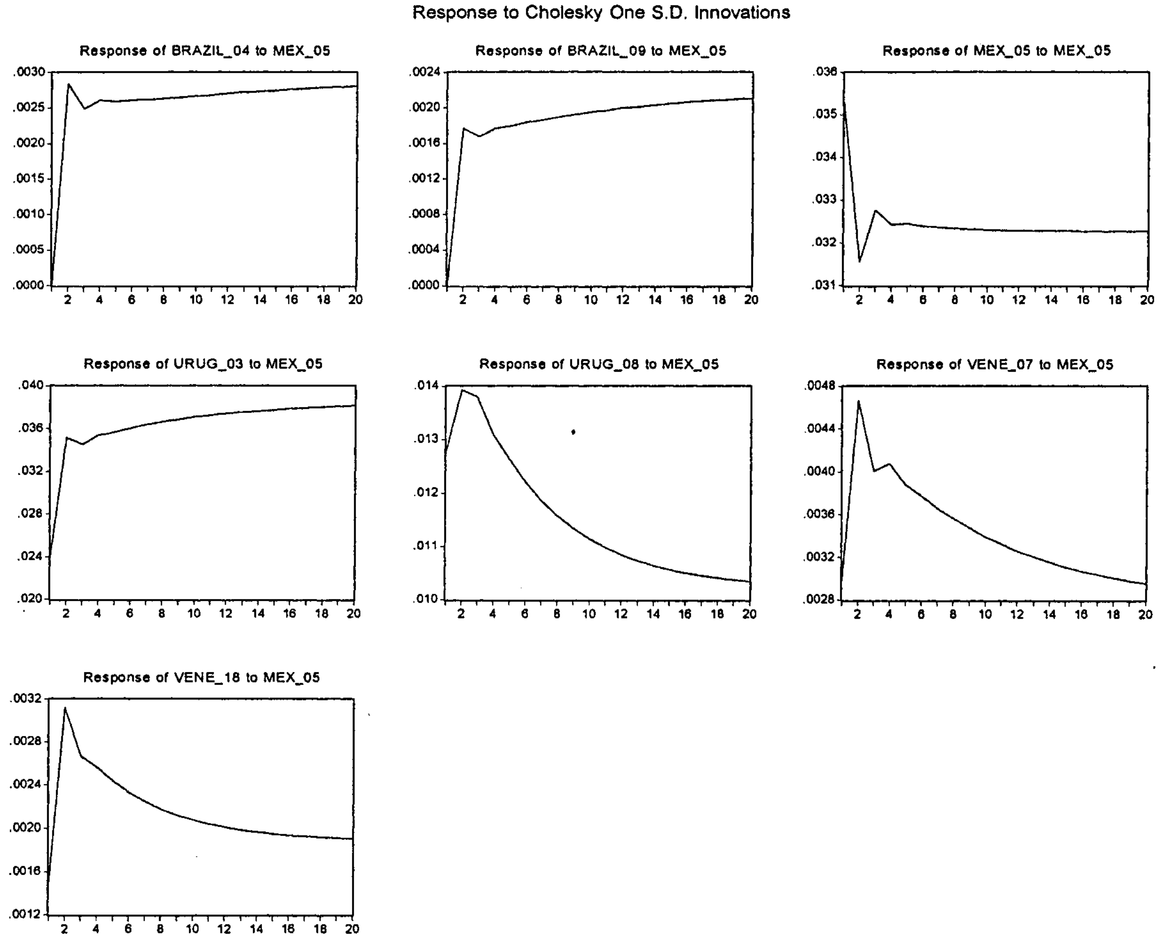


Figure 7: Impulse Responses

Figure 7.1.4 for Latin America: Impulse mex_07

Responses to mex_05, mex_07, urug_03, urug_08, vene_07 and vene_18

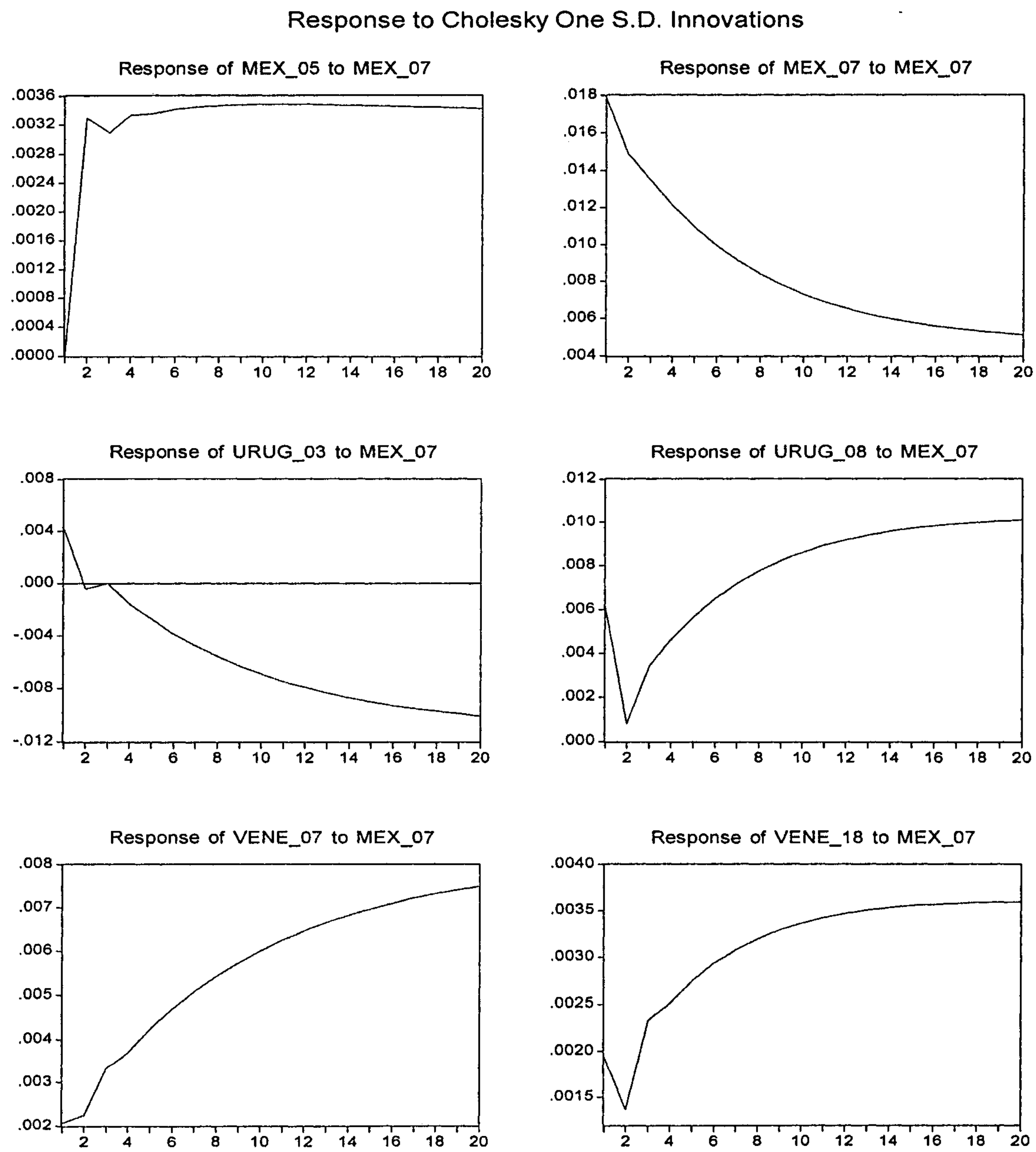


Figure 7: Impulse Responses

Figure 7.1.5 for Latin America: Impulse arge_frb

Responses to arge_09, urug_08 and arge_frb

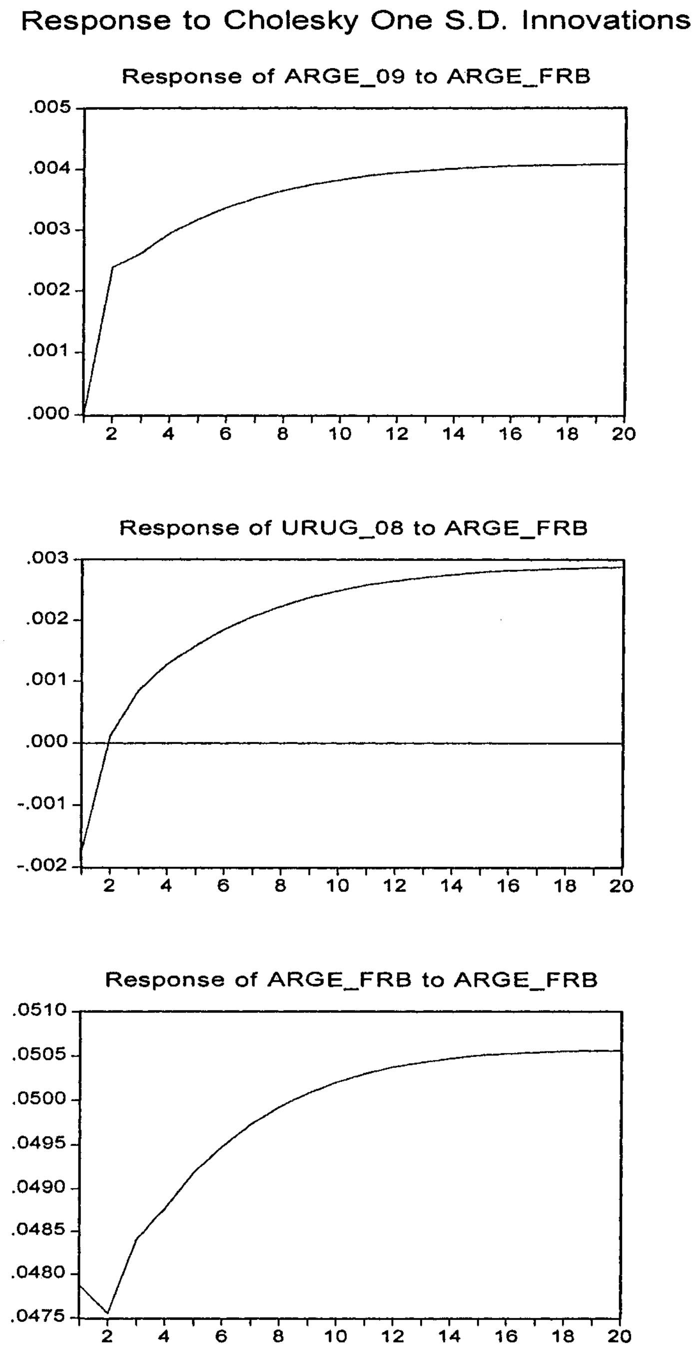


Figure 7: Impulse Responses

Figure 7.1.6 for Latin America: Impulse urug_03

Responses to urug_08, vene_18, mex_07 and urug_03

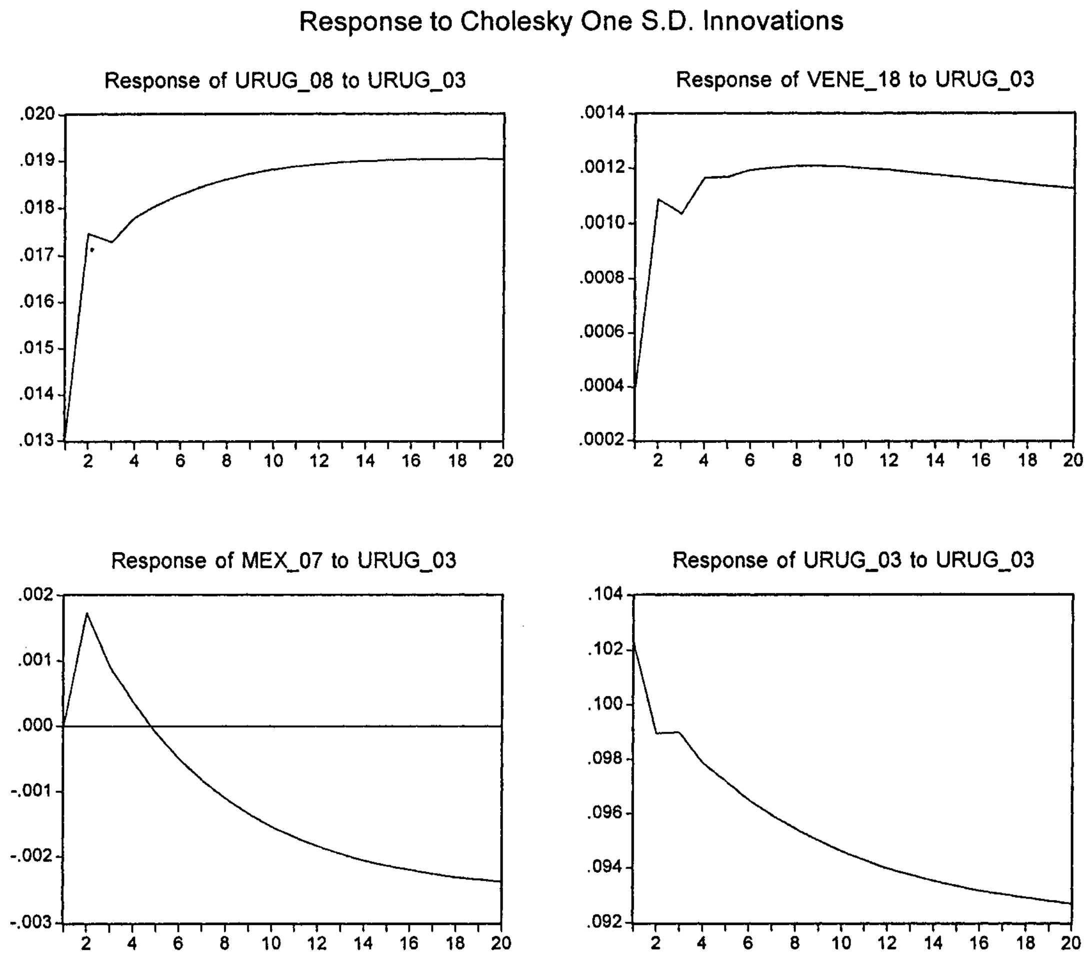
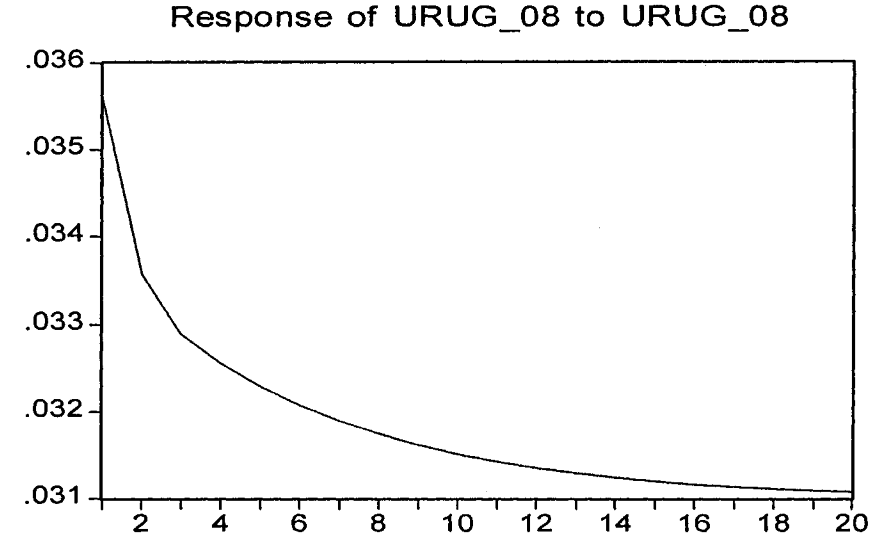


Figure 7: Impulse Responses

Figure 7.1.7 for Latin America: Impulse urug_08

Responses to urug_08 and vene_07

Response to Cholesky One S.D. Innovations



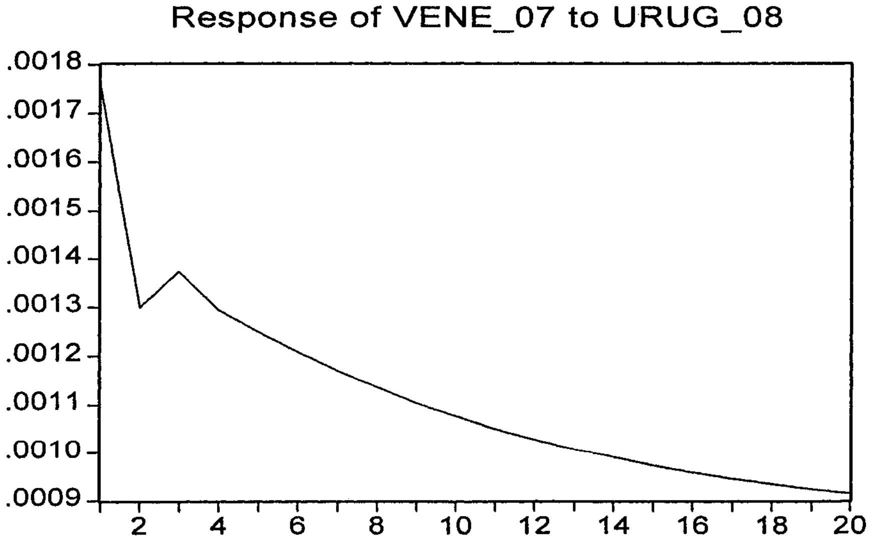


Figure 7: Impulse Responses

Figure 7.1.8 for Latin America: Impulse vene_07

Responses to urug_03, vene_18 and vene_07

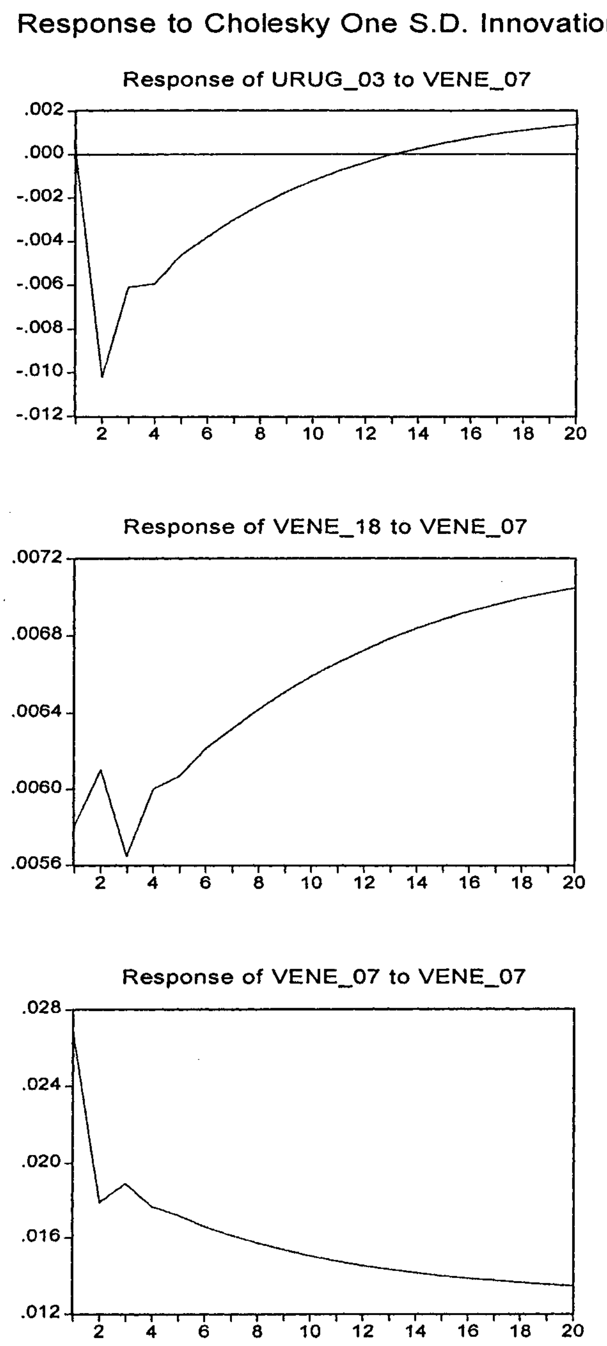


Figure 7: Impulse Responses

Figure 7.1.9 for Latin America: Impulse vene_18

Responses to vene_18 and vene_07

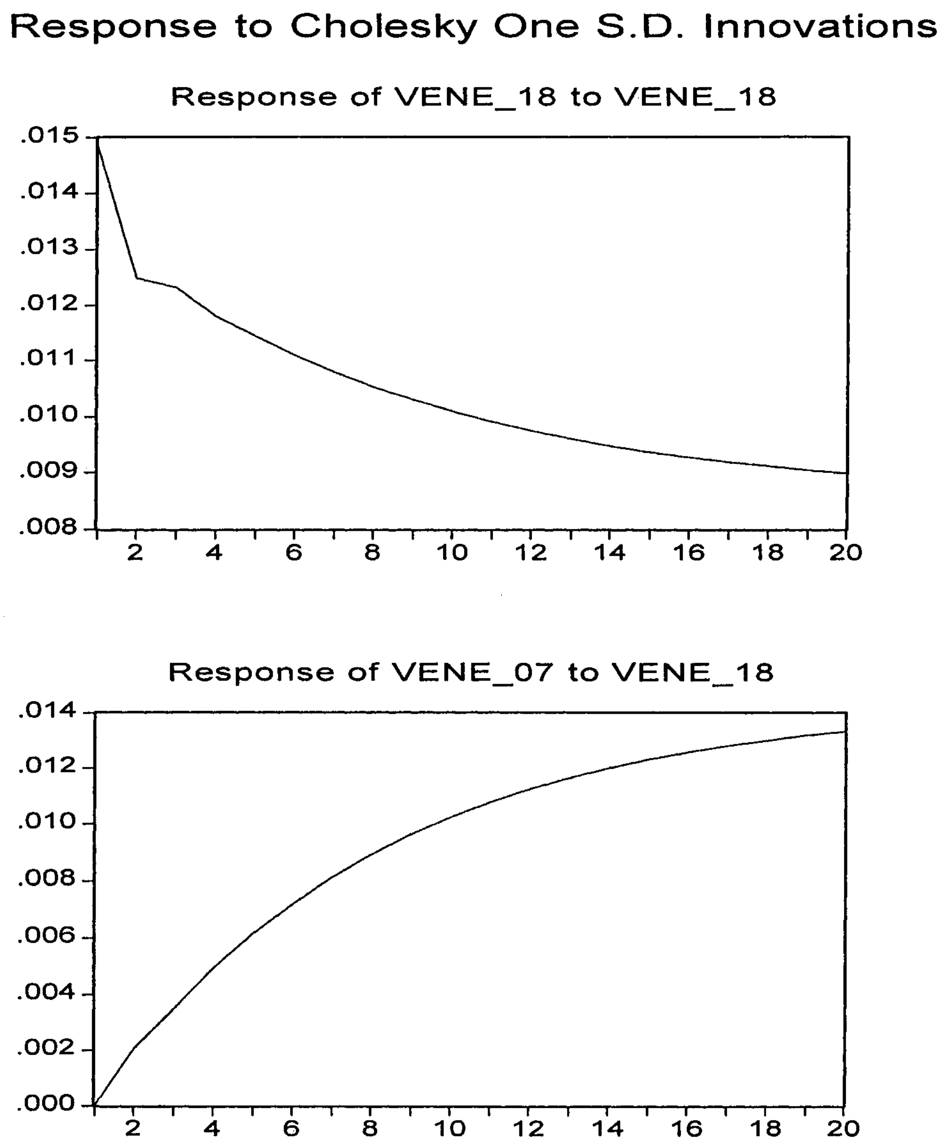


Figure 7: Impulse Responses

Figure 7.2.1 for East Asia: Impulse phil_10

Responses to kdb_72506, kor_08, phil_pdi and phil_10

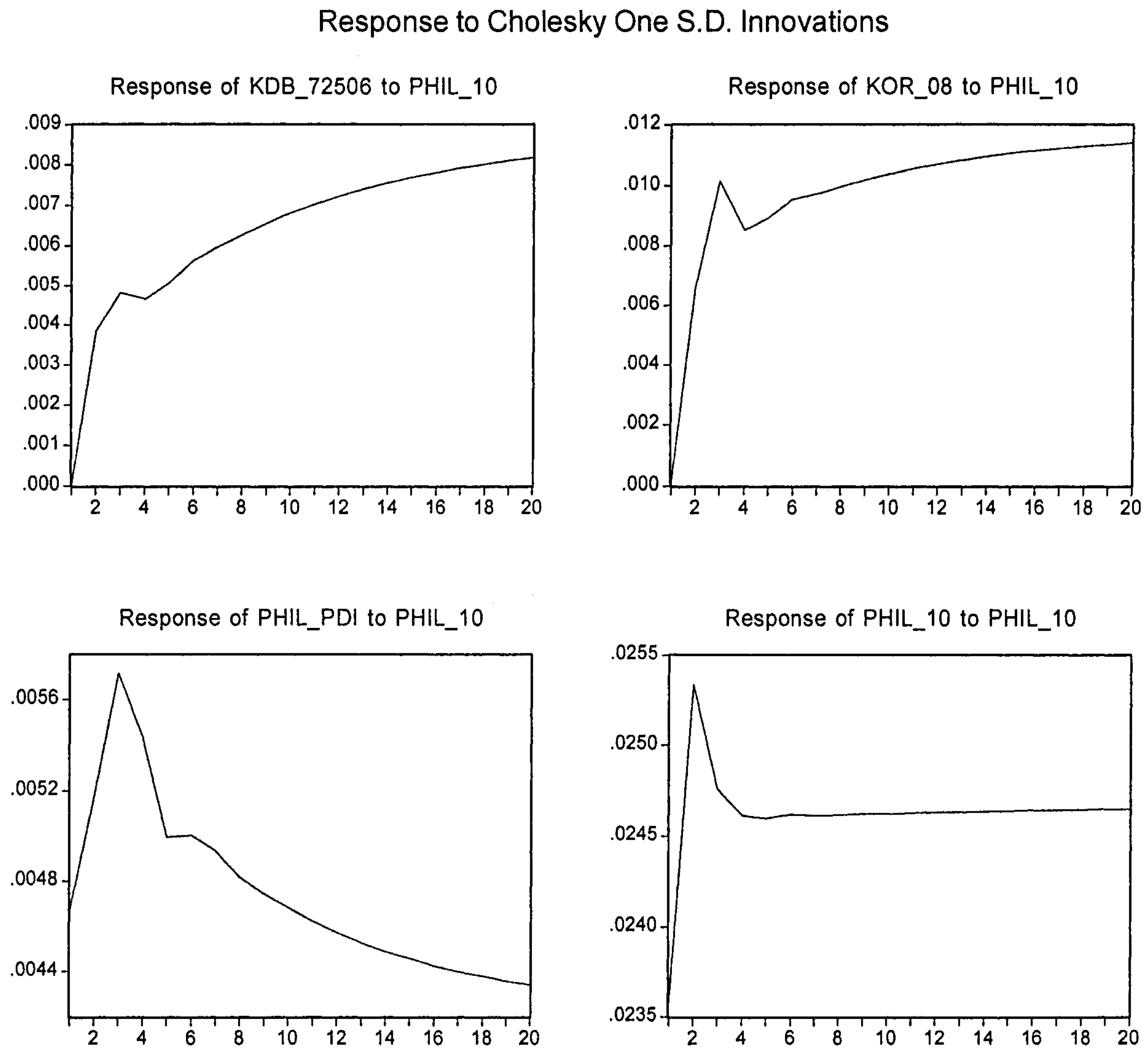


Figure 7: Impulse Responses

<u>Figure 7.2.2 for East Asia</u>: Impulse phil_pdi

Responses to kor_08, phil_10 and phil_pdi

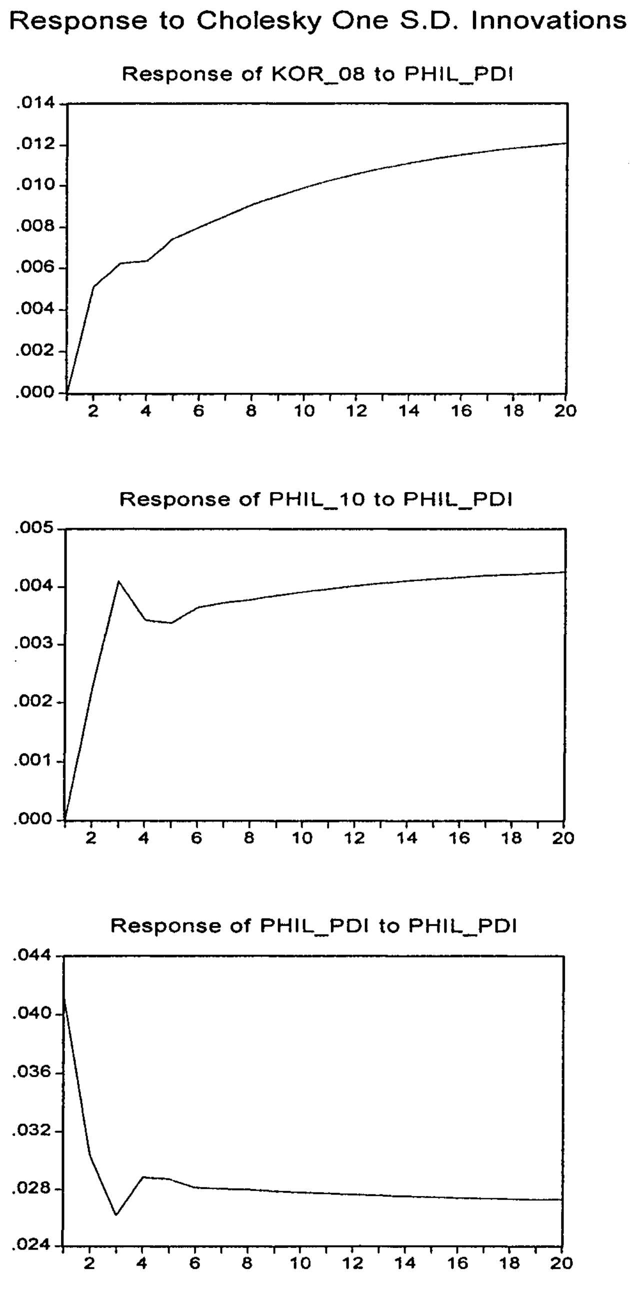


Figure 7: Impulse Responses

Figure 7.2.3 for East Asia: Impulse kor_08

Responses to kdb_72506, phil_pdi and kor_08

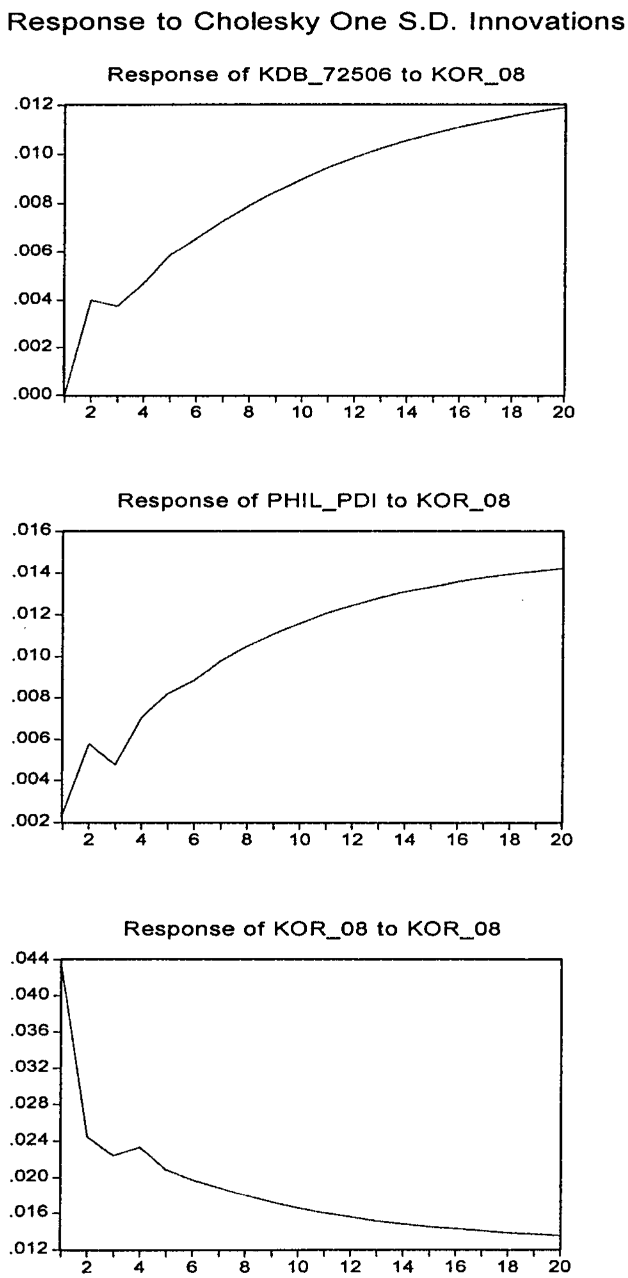


Figure 7: Impulse Responses

<u>Figure 7.2.4 for East Asia</u>: Impulse kdb_72506

Responses to phil_pdi and kdb_72506

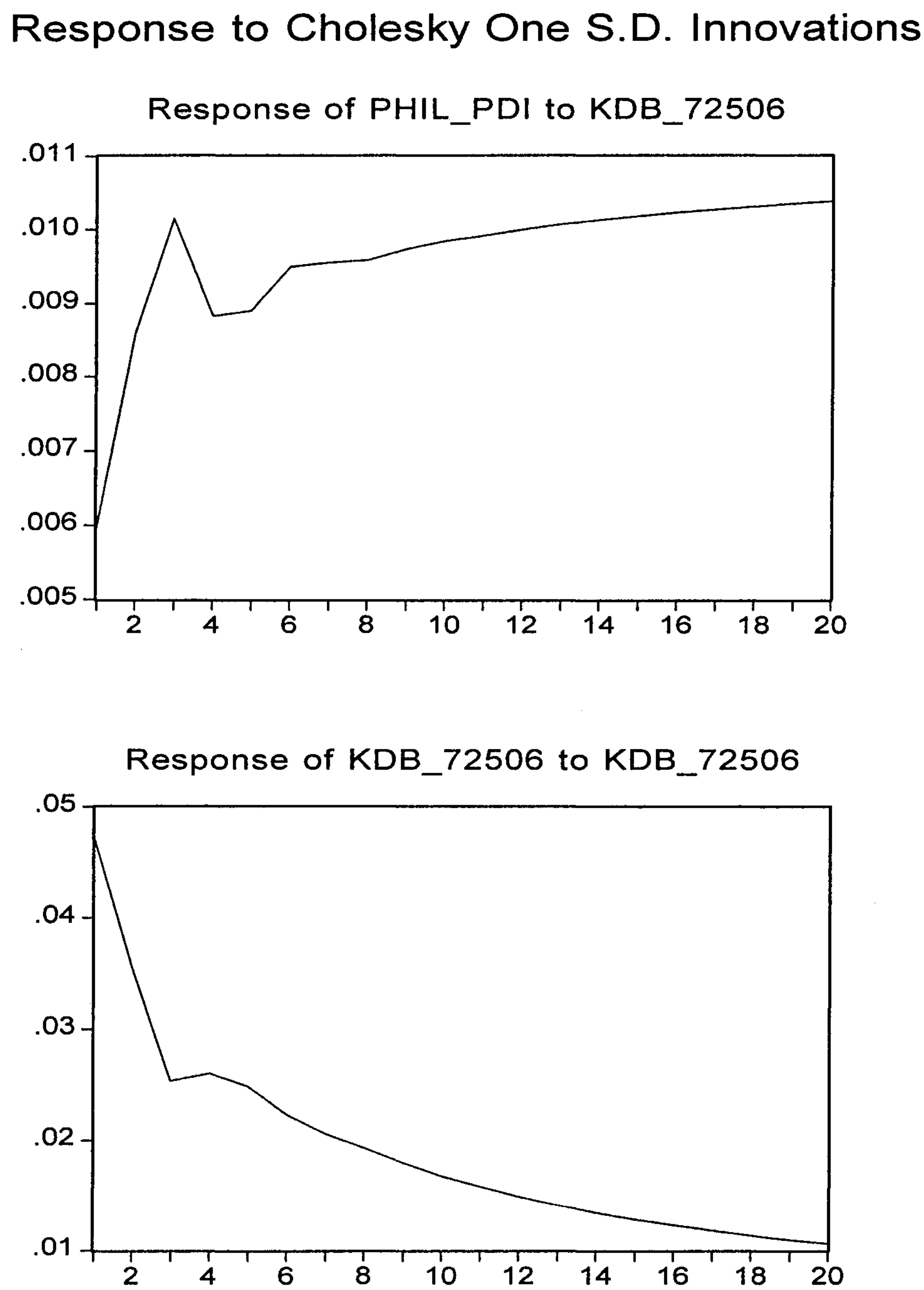


Figure 7: Impulse Responses

Figure 7.3.1 for East Europe: Impulse rus_03

Responses to pol_17, pol_pbs_09, rus_07 and rus_03

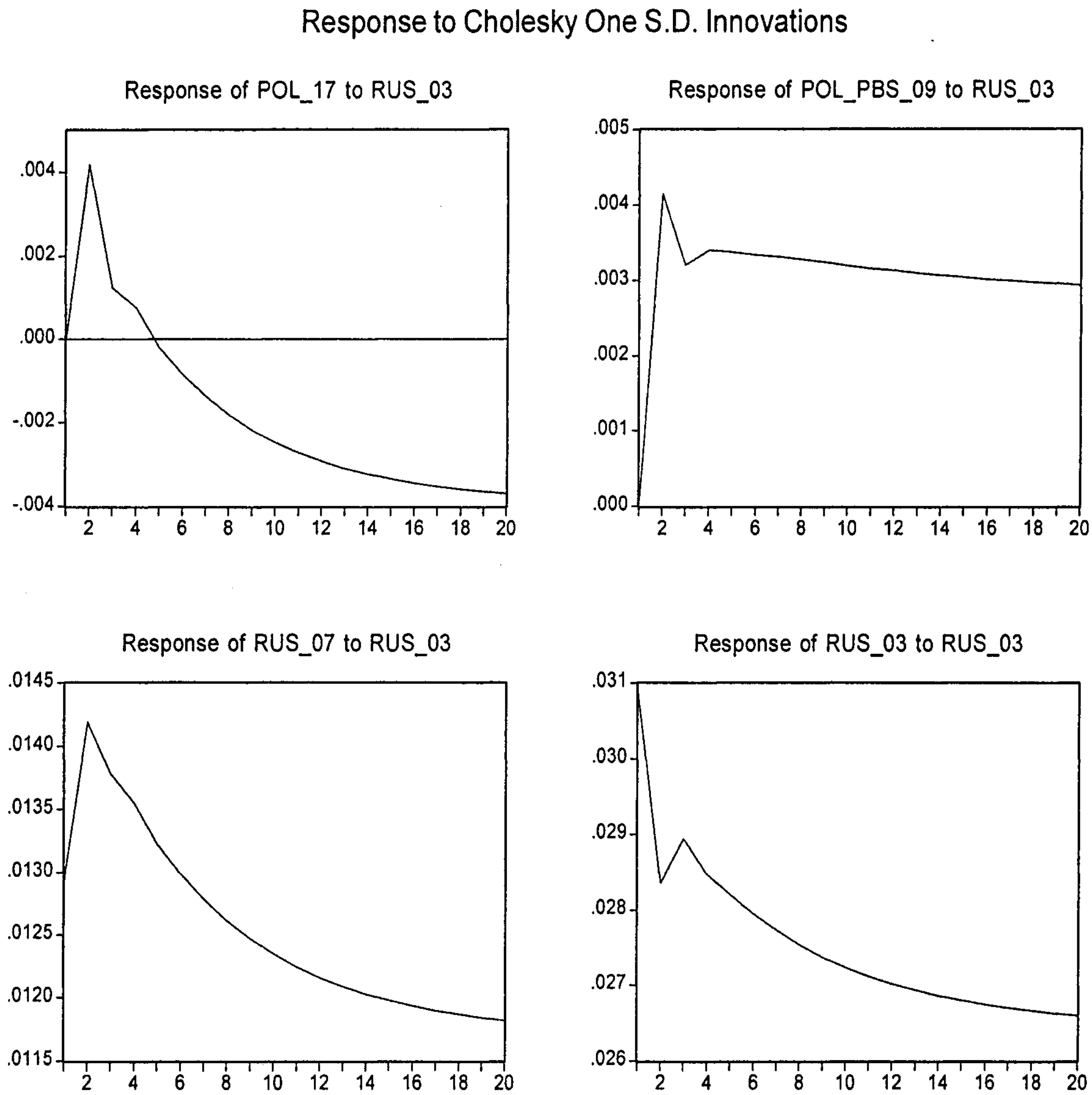


Figure 7: Impulse Responses

<u>Figure 7.3.2 for East Europe</u>: Impulse rus_07

Responses to bulgaria_fli12, bulgaria_iab11, rus_03, rus_10 and rus_07

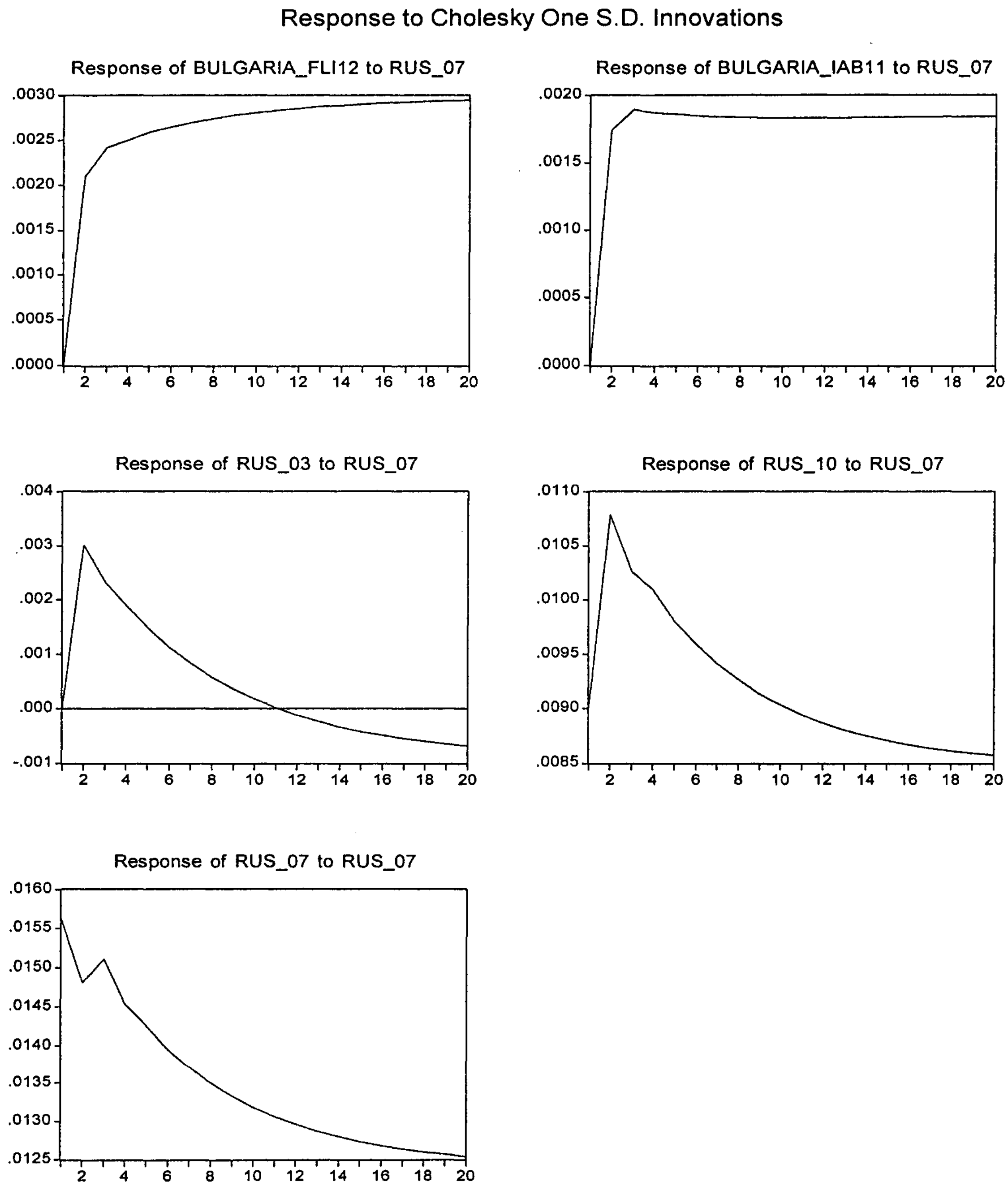


Figure 7: Impulse Responses

Figure 7.3.3 for East Europe: Impulse rus_10

Responses to bulgaria_fli12, bulgaria_iab11, rus_03, rus_07 and rus_10

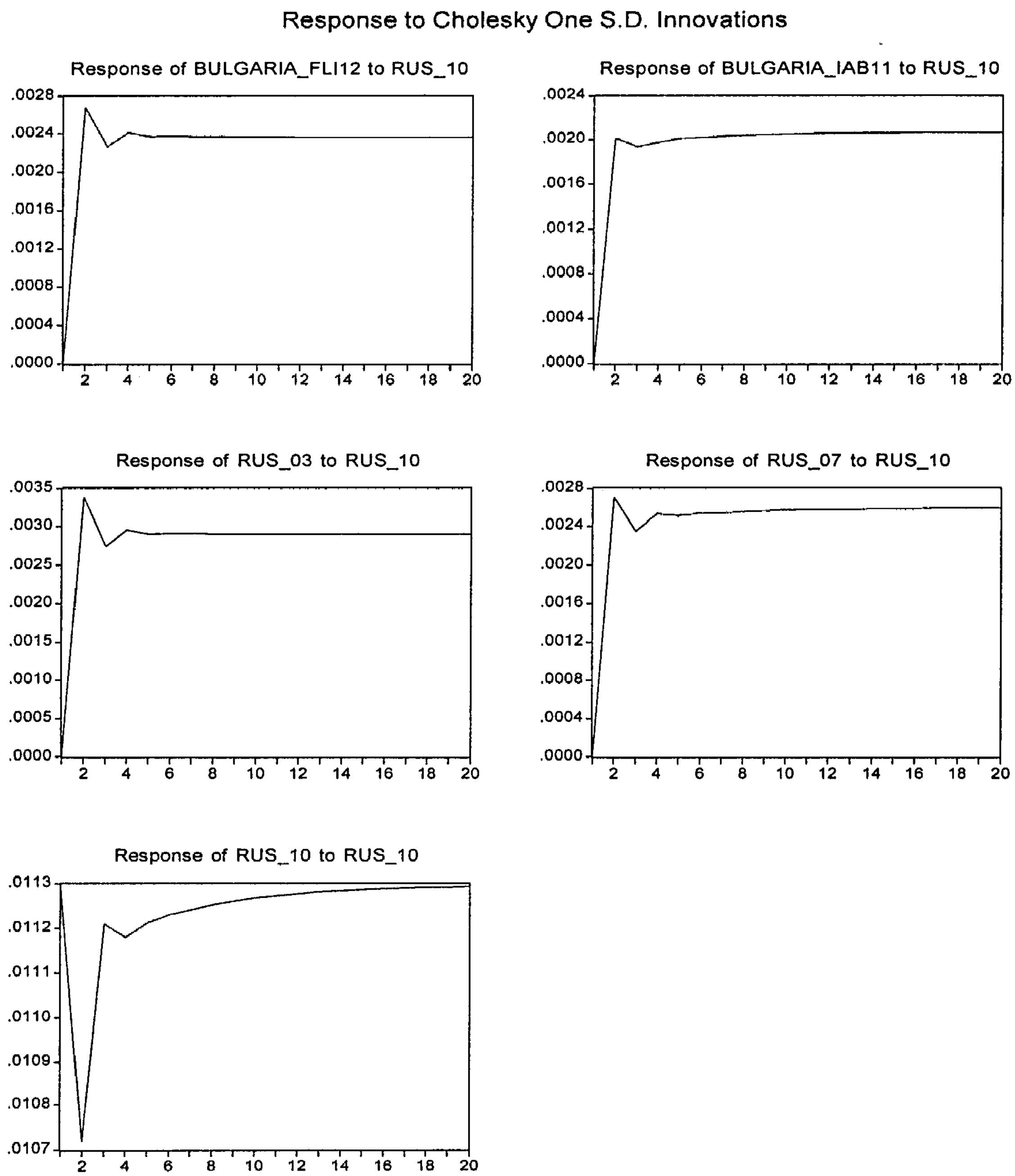


Figure 7: Impulse Responses

Figure 7.3.4 for East Europe: Impulse pol_17

Responses to pol_04 and pol_17

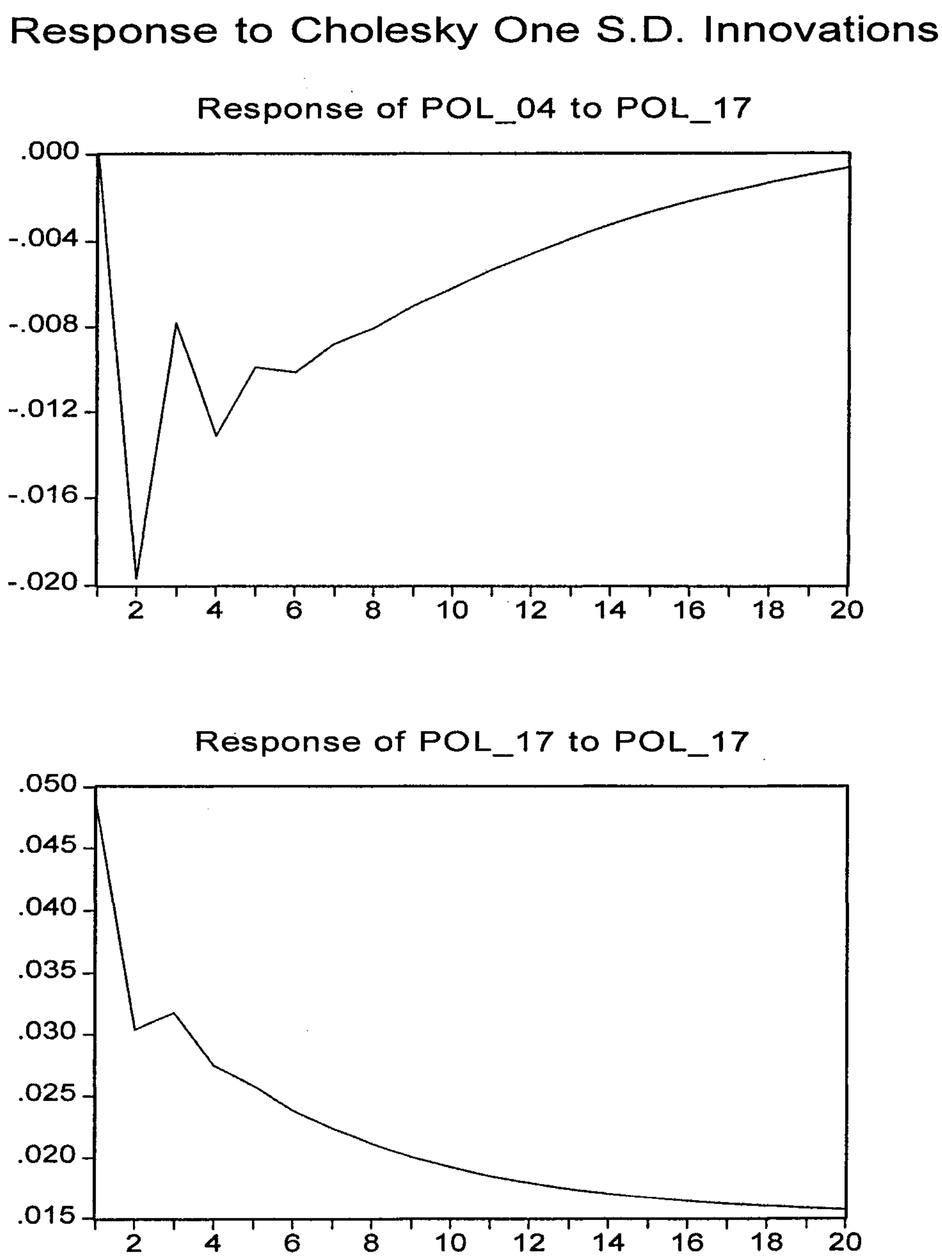


Figure 7: Impulse Responses

Figure 7.3.5 for East Europe: Impulse pol_pbs_09

Responses to pol_17 and pol_pbs_09

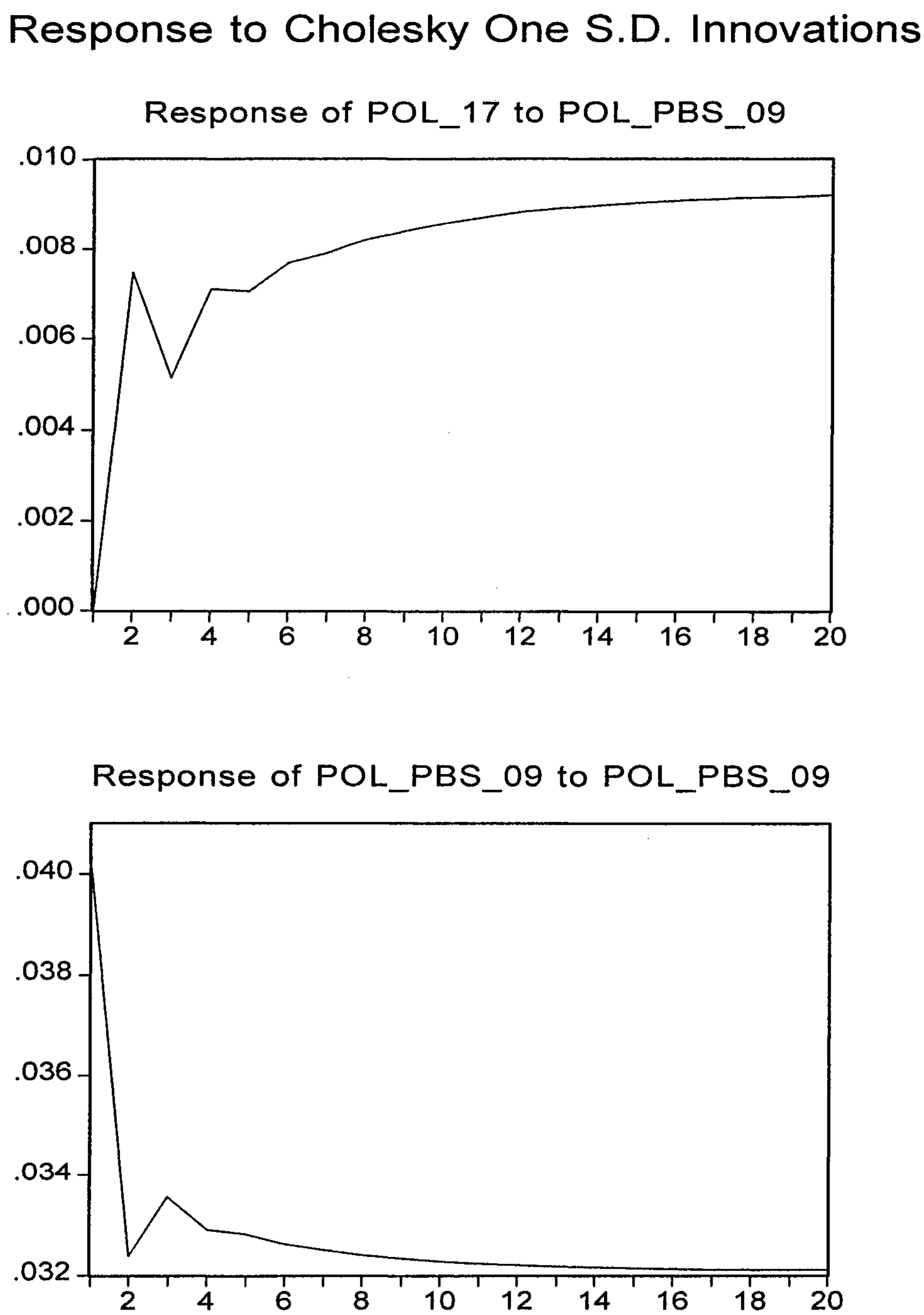


Figure 7: Impulse Responses

Figure 7.3.6 for East Europe: Impulse bulgaria_iab11

Responses to bulgaria_fli12, rus_07 and bulgaria_iab11

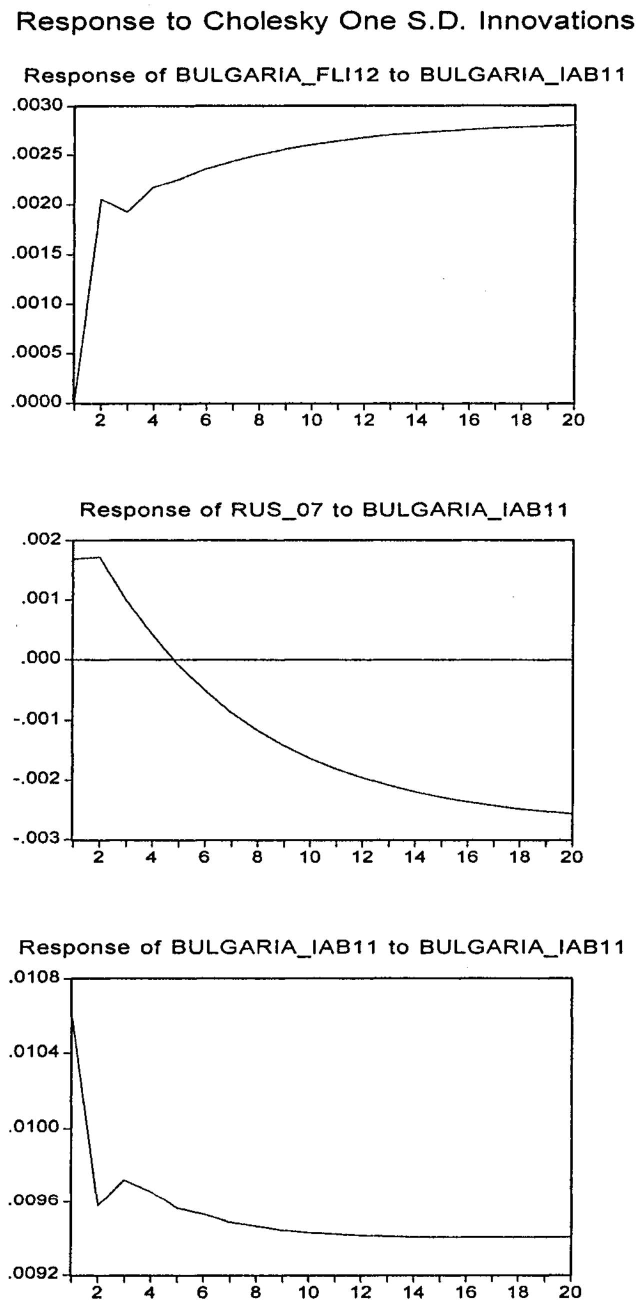


Figure 7: Impulse Responses

Figure 7.3.7 for East Europe: Impulse bulgaria_fli12

Responses to rus_07, bulgaria_iab11 and bulgaria_fli12

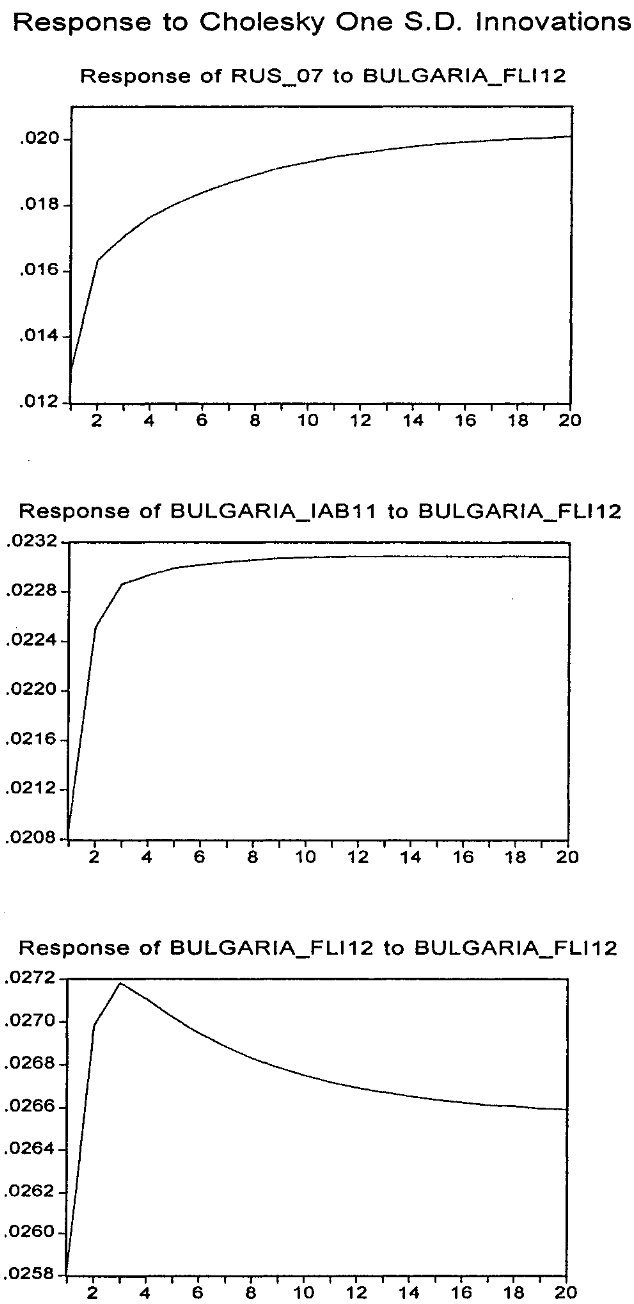
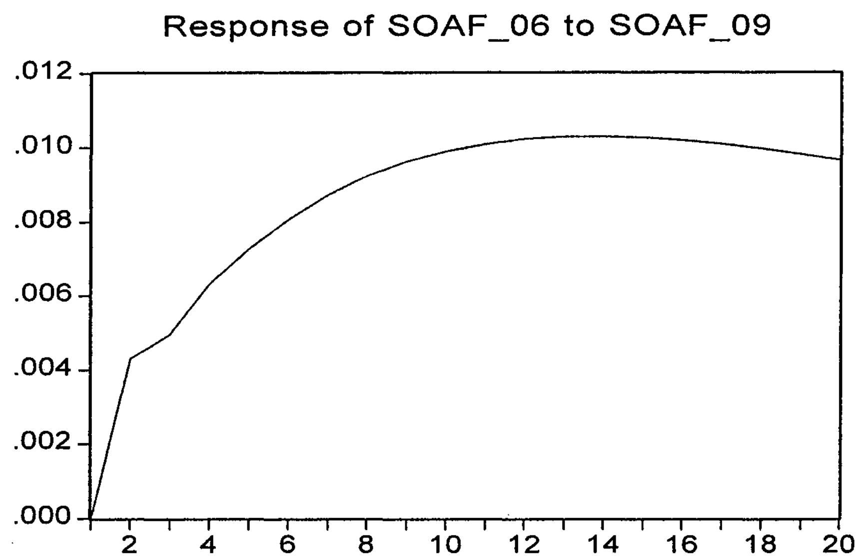


Figure 7: Impulse Responses

Figure 7.4. for Africa: Impulse soaf_09

Responses to soaf_06 and soaf_09

Response to Cholesky One S.D. Innovations



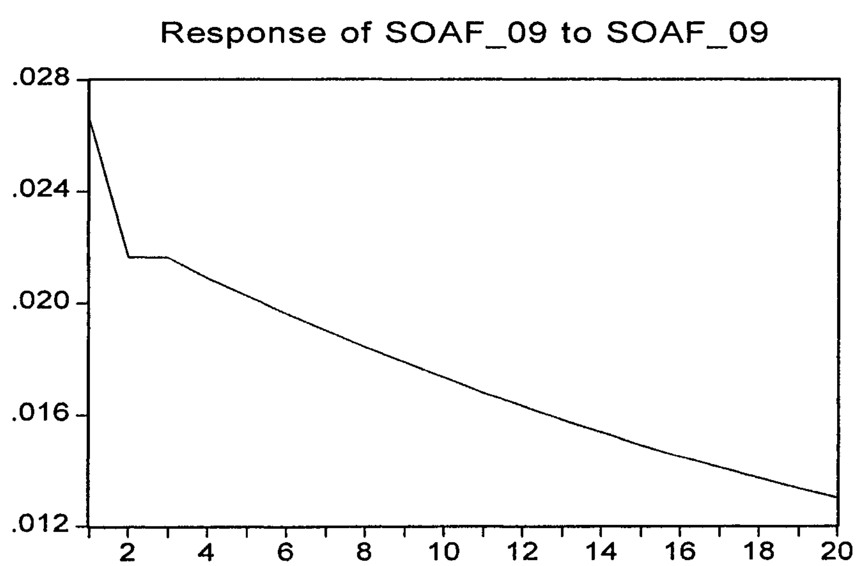


Figure 8: Comparing Cointegrating Vectors for Risk Premiums

<u>Figure 8.1</u>: Comparing all the first Cointegrating Vectors for Risk Premiums

COI_1_AF is the first cointegrating vector for Africa
COI_1_EA is the first cointegrating vector for East Asia
COI_1_EE is the first cointegrating vector for East Europe
COI_1_LA is the first cointegrating vector for Latin America

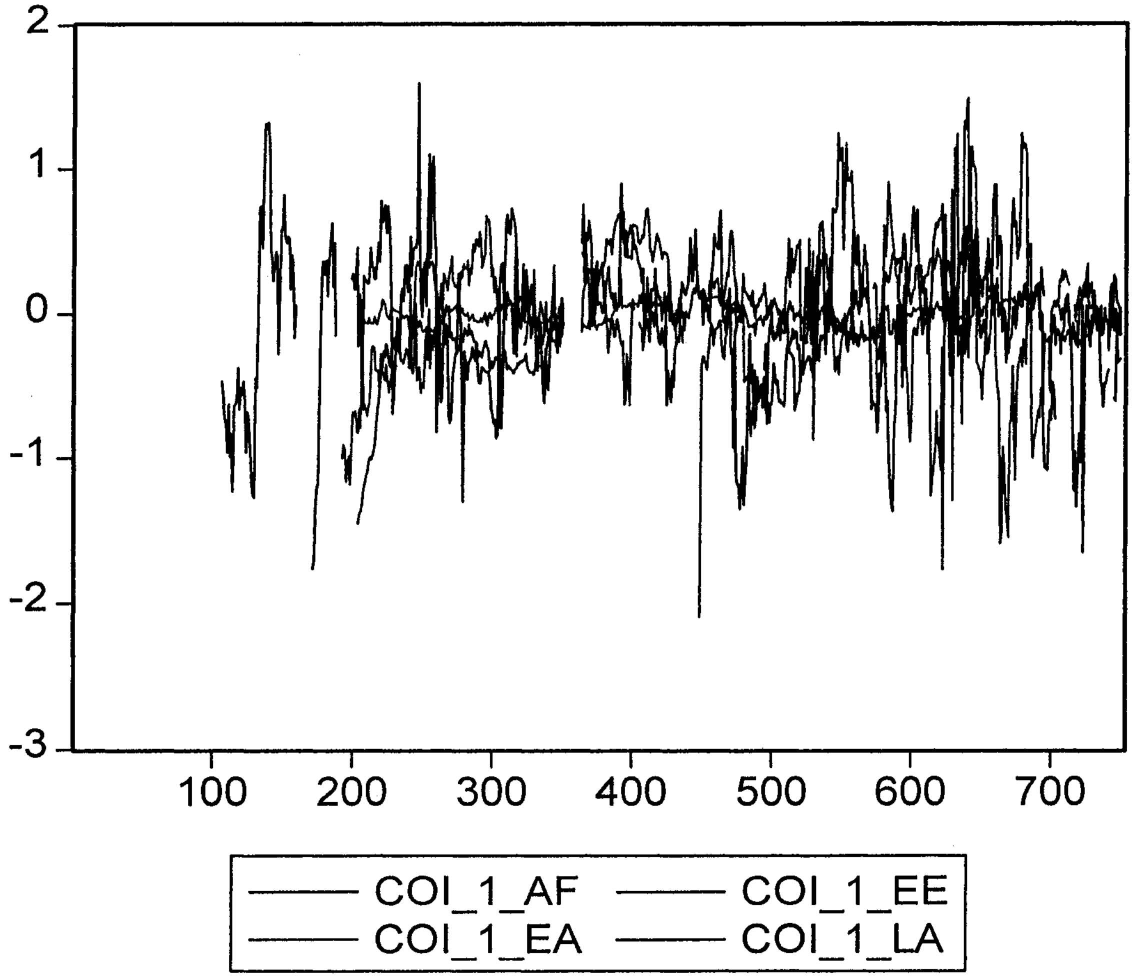


Figure 8: Comparing Cointegrating Vectors for Risk Premiums

Figure 8.2: Comparing the second Cointegrating Vectors for Risk Premiums

COI_2_AF is the second cointegrating vector for Africa
COI_2_EA is the second cointegrating vector for East Asia
COI_2_EE is the second cointegrating vector for East Europe
COI_2_LA is the second cointegrating vector for Latin America

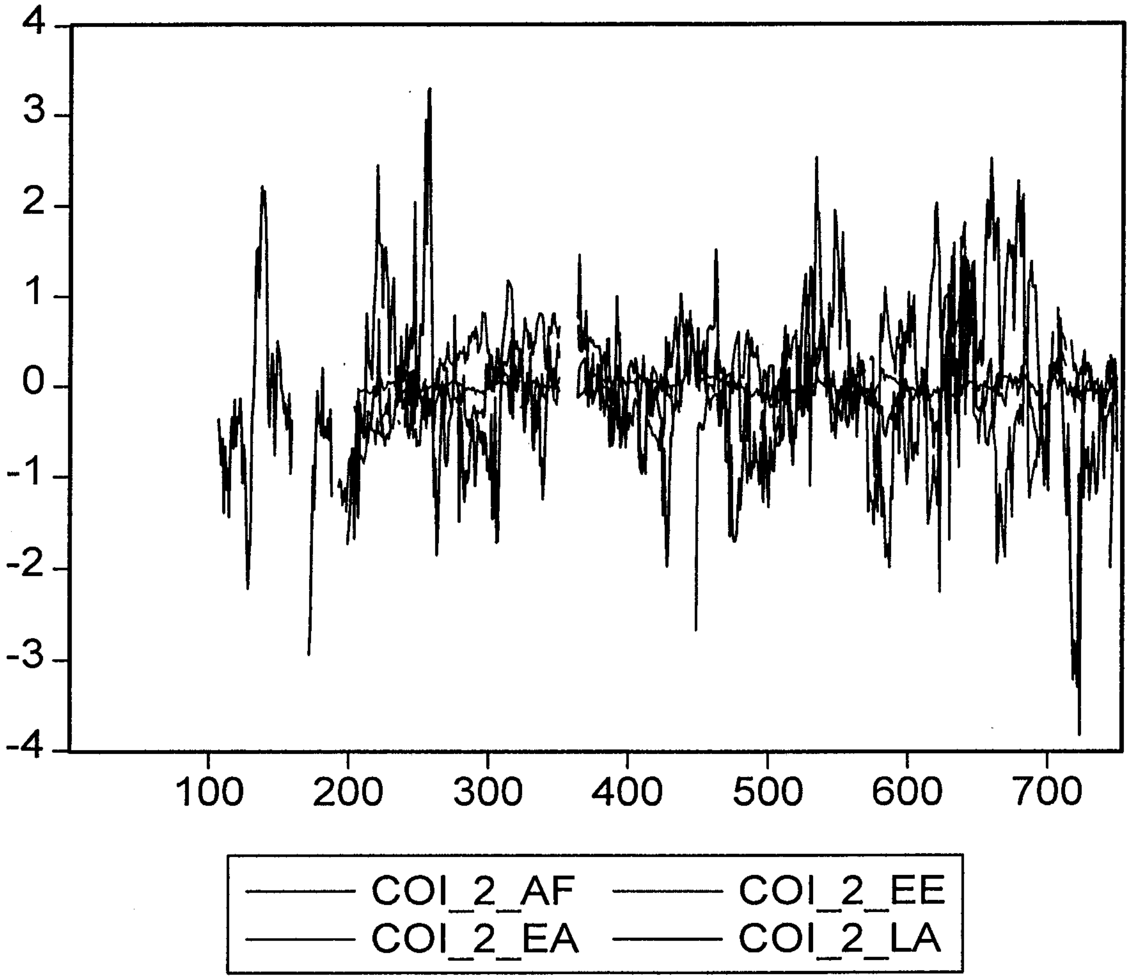


Figure 8: Comparing Cointegrating Vectors for Risk Premiums

Figure 8.3: Comparing the Cointegrating Vectors COI_1_EE and COI_1_LA

COI_1_EE is the first cointegrating vector for East Europe
COI_1_LA is the first cointegrating vector for Latin America

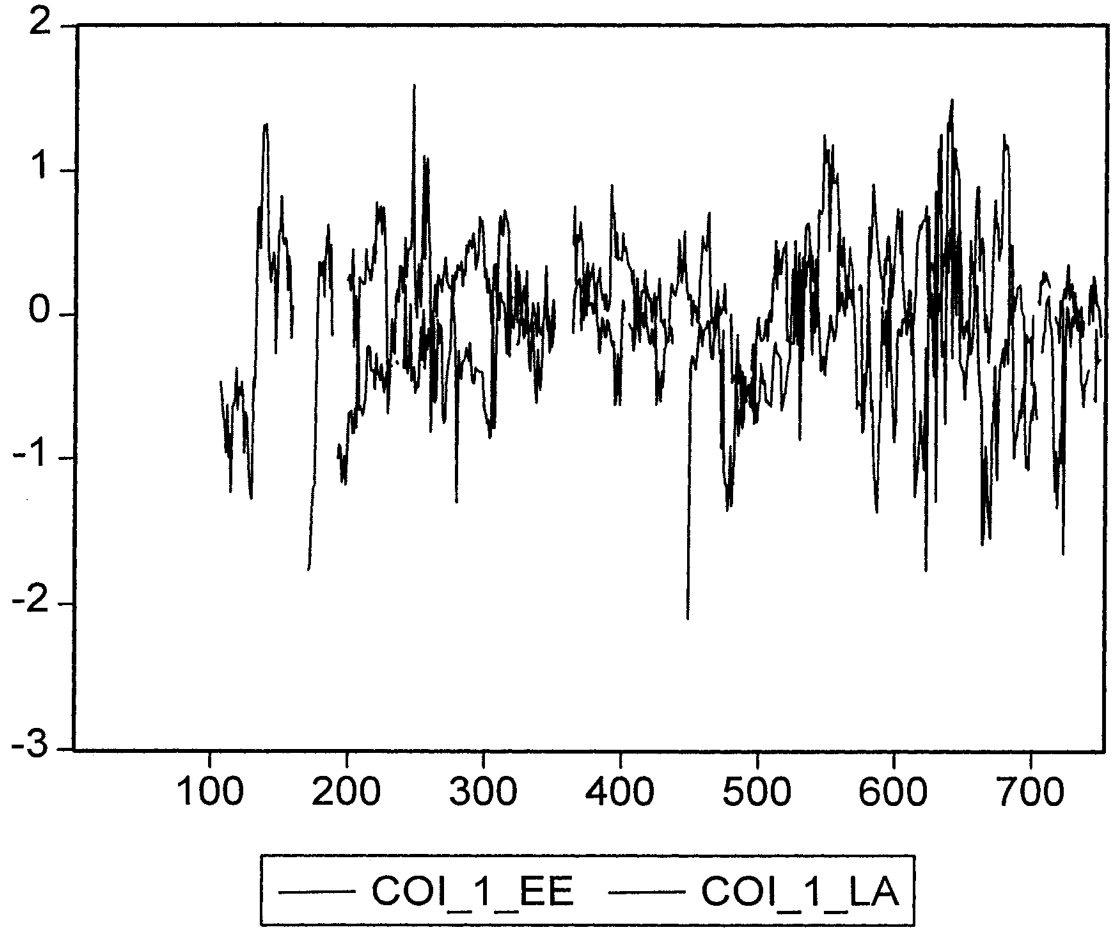


Figure 8: Comparing Cointegrating Vectors for Risk Premiums

Figure 8.4: Comparing the Cointegrating Vectors COI_1_EA and COI_1_EE

COI_1_EA is the first cointegrating vector for East Asia
COI_1_EE is the first cointegrating vector for East Europe

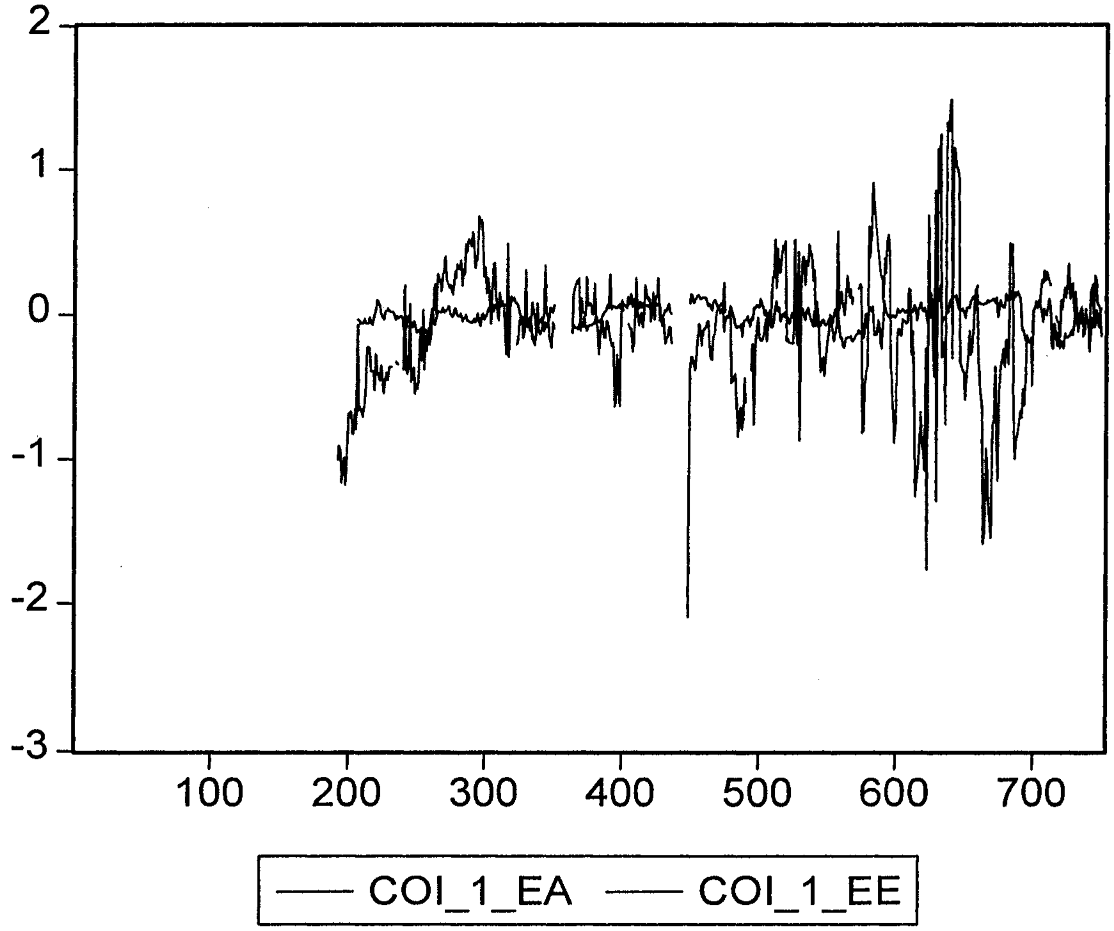


Figure 8: Comparing Cointegrating Vectors for Risk Premiums

Figure 8.5: Comparing the Cointegrating Vectors COI_1_EA and COI_1_LA

COI_1_EA is the first cointegrating vector for East Asia
COI_1_LA is the first cointegrating vector for Latin America

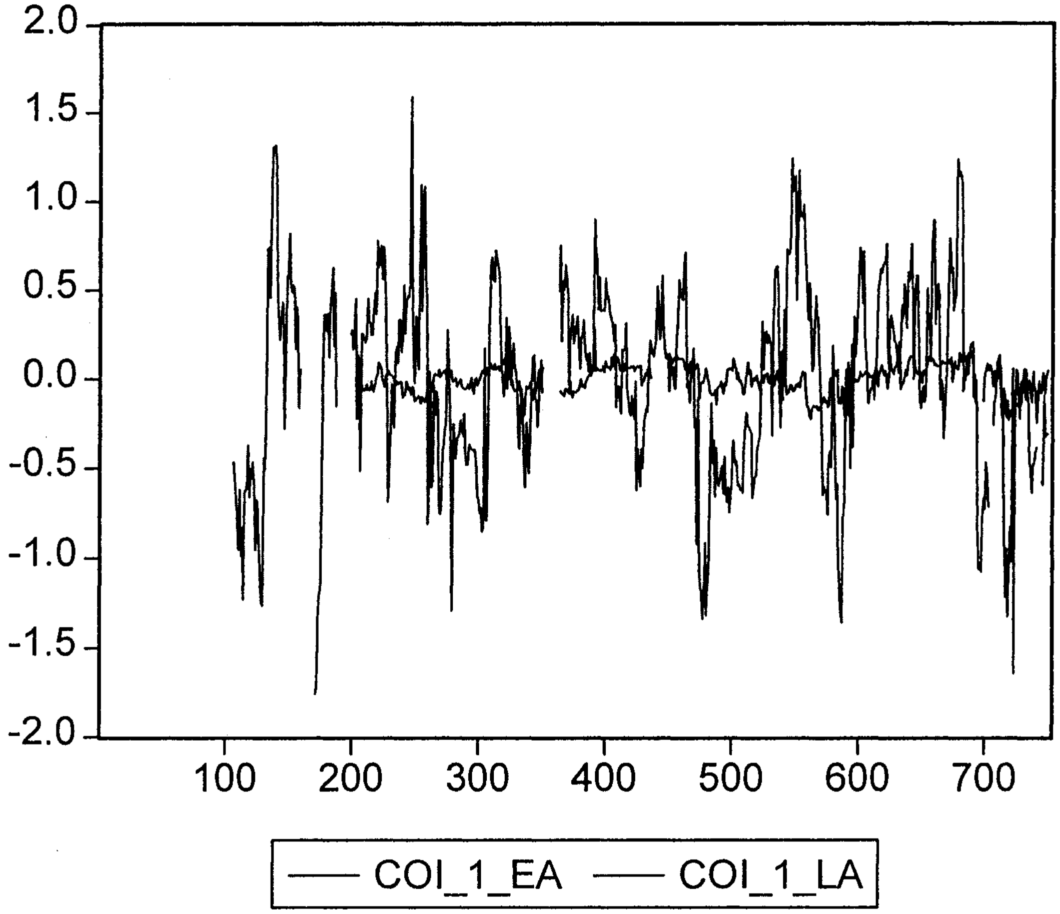


Figure 8: Comparing Cointegrating Vectors for Risk Premiums

Figure 8.6: Comparing the Cointegrating Vectors COI_1_EA and COI_1_AF

COI_1_AF is the first cointegrating vector for Africa
COI_1_EA is the first cointegrating vector for East Asia

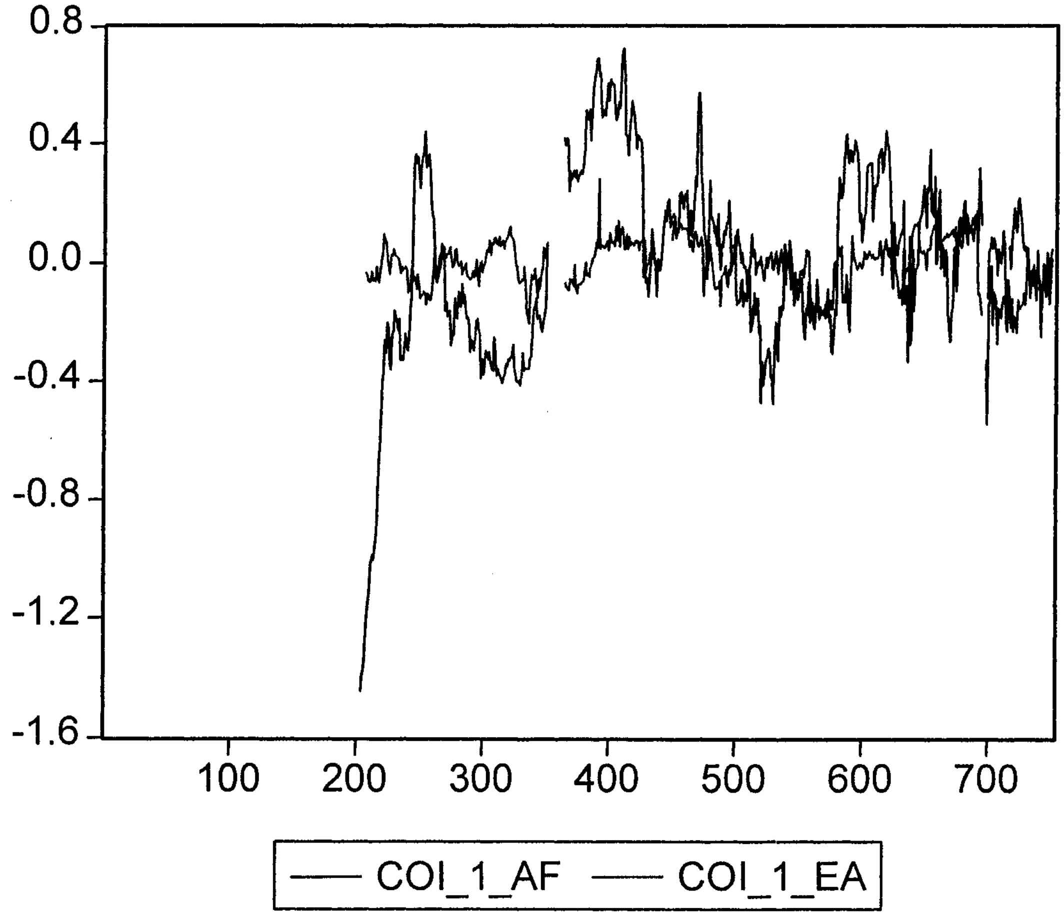


Figure 8: Comparing Cointegrating Vectors for Risk Premiums

Figure 8.7: Comparing the Cointegrating Vectors COI_1_EE and COI_1_AF

COI_1_AF is the first cointegrating vector for Africa
COI_1_EE is the first cointegrating vector for East Europe

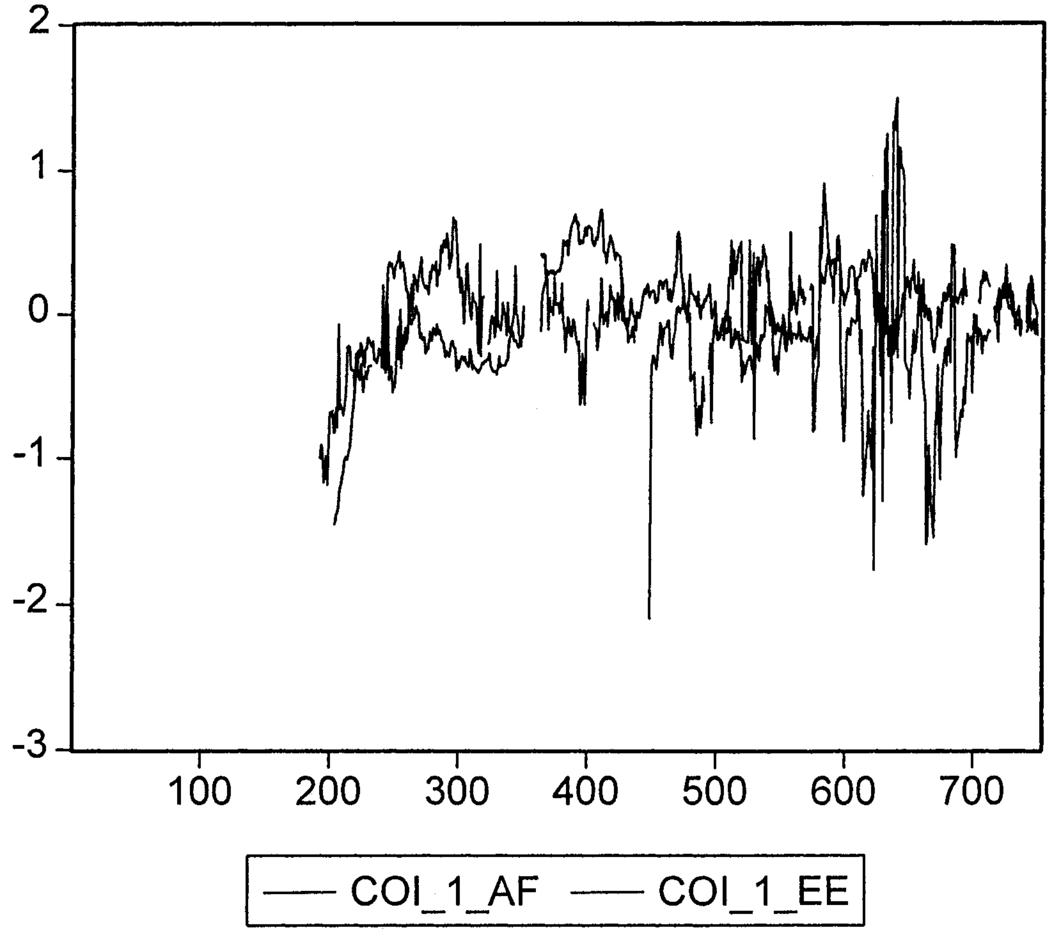
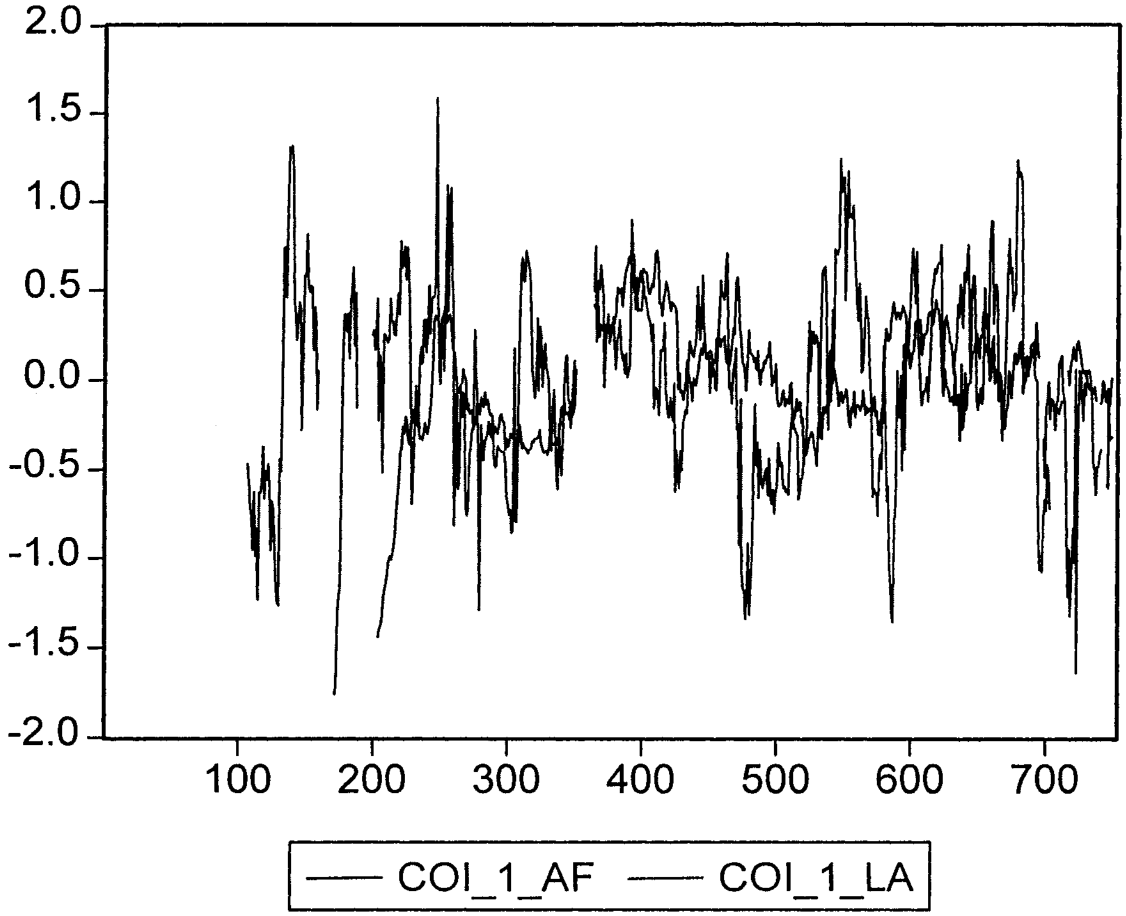


Figure 8: Comparing Cointegrating Vectors for Risk Premiums

Figure 8.8: Comparing the Cointegrating Vectors COI_1_AF and COI_1_LA

COI_1_AF is the first cointegrating vector for Africa
COI_1_LA is the first cointegrating vector for Latin America



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