



working paper series

BUSINESS CYCLE SYNCHRONIZATION IN EURO AREA AND GCC COUNTRIES: A WAVELETS-GAAPPROACH

Mustapha Djennas, Mohamed Benbouziane and Meriem Djennas

Working Paper No. 772

BUSINESS CYCLE SYNCHRONIZATION IN EURO AREA AND GCC COUNTRIES: A WAVELETS-GAAPPROACH

Mustapha Djennas, Mohamed Benbouziane and Meriem Djennas

Working Paper 772

September 2013

Send correspondence to: Mustapha Djennas Faculty of economics, University of Tlemcen, Algeria, djennasm@yahoo.fr First published in 2013 by The Economic Research Forum (ERF) 21 Al-Sad Al-Aaly Street Dokki, Giza Egypt www.erf.org.eg

Copyright © The Economic Research Forum, 2013

All rights reserved. No part of this publication may be reproduced in any form or by any electronic or mechanical means, including information storage and retrieval systems, without permission in writing from the publisher.

The findings, interpretations and conclusions expressed in this publication are entirely those of the author(s) and should not be attributed to the Economic Research Forum, members of its Board of Trustees, or its donors.

Abstract

In this paper, we use an Extreme Bound Analysis (EBA) and Wavelet Transformation (WT) to provide a detailed characterization of the business cycle synchronization among the countries under study, namely Euro Area and Gulf Cooperation Countries (GCC) countries. In addition, we introduce a Genetic Algorithm combined with wavelets transform to search for the best combinations of synchronization factors which offer an optimal solution for changing business cycles in order to achieve high levels of economic integration between two groups of countries. The analyses are conducted by introducing the main determinants of business cycles existing in the literature in order to understand how they could elvolve both in time and in scale, depending on the different phases of the system construction. Globally, and unlike the Euro Area, the results show not only a considerable delay in creating an economic and financial integration in the GCC, but more importantly, a growing divergence in business cycles among the countries.

JEL Classification: E32, F15, F41, F42.

Keywords: Business Cycles -Synchronization -Wavelets Analysis- Genetic Algorithm - Extreme Bounds Analysis -Trade - Economic and Monetary Union.

ملخص

في هذه الورقة، نستخدم تحليل ملزمة المتطرفة (EBA Extreme Bound Analysis) وتحول المويجات (EBA Extreme Bound Analysis) لتوفير توصيف مفصل لتزامن دورة الأعمال بين البلدان قيد الدراسة، و هما منطقة اليورو و دول مجلس (Transformation WT). وبالإضافة إلى ذلك، ونحن نقدم الخوارزمية الجينية (Genetic Algorithm) جنبا إلى جنب مع WT WT T تعاون الخليجي (GCC). وبالإضافة إلى ذلك، ونحن نقدم الخوارزمية الجينية (Genetic Algorithm) جنبا إلى جنب مع WT النعاون الخليجي (Genetic Algorithm) ونحن نقدم الخوارزمية الجينية (Genetic Algorithm) جنبا إلى جنب مع WT النعاون الخليجي (Genetic Algorithm) ونا التي تقدم الحل الأمثل لتغيير دورات الأعمال التجارية من أجل تحقيق مستويات عالية من البحث عن أفضل مزيج من عوامل التزامن التي تقدم الحل الأمثل لتغيير دورات الأعمال التجارية من أجل تحقيق مستويات عالية من التكامل الاقتصادي بين مجموعتين من البلدان. ويتم إجراء التحاليل عن طريق إدخال المحددات الرئيسية للدورات التجارية القائمة في الأدب من أجل فهم الكيفية التي يمكن أن تنمو بها سواء في الوقت أو من حيث النطاق، اعتمادا على المراحل المختلفة لبناء نظام. وعلى الأدب من أجل فهم الكيفية التعامي، وعلى المحدات الرئيسية للدورات التجارية القائمة في وعلى الأدب من أجل فهم الكيفية التي يمكن أن تنمو بها سواء في الوقت أو من حيث النطاق، اعتمادا على المراحل المختلفة لبناء نظام. وعلى المحيد العالم، وعلى المراحل المختلفة لبناء نظام. وعلى الصعيد العالمي، وعلى عكس منطقة اليورو، أظهرت النتائج إلى تأخير كبير في خلق التكامل الاقتصادي والمالي في دول مجلس التعاون الخليجي، ولكن الأهم من ذلك، التباين المتزايد في الدورات التجارية بين الدول.

1. Introduction

For many years, there was a very thorough debate on issues in relation with the establishment of secure economic zones, or even single currency areas. As the business cycle synchronization is widely related to the literature on optimal currency areas and on economic unions, and despite the existence of many divergent points of view in both academic and political spheres, there was still a large consensus about the importance of business cycle synchronization as a necessary condition of successful economic integration.

In this paper, we will try to investigate the underlying factors of business cycle synchronization in the Euro area and GCC countries by considering a large number of business cycle synchronization determinants inspired from the previous theoretical and empirical works in this research field. In addition, the most important contribution in this work is the use of a combination of relevant econometric and heuristic tools, to be specific, the use of an efficient type of regression: Extreme Bound Analysis (EBA), Stationary Wavelets Transformation (SWT), Wavelets crossing and coherence, and finally a Wavelets-Genetic Algorithmoptimization (W-GA).

The present paper has many important objectives embodied in three fundamental axes. First, our objective is to demonstrate to what degree business cycles are correllated across Euro area and GCC countries. In addition, the analysis is extended to understand the gap between the economic integration in the EU and the integration in the GCC. We propose the use of a denoised signal of the cyclical component of GDP in order to assess the different degrees of synchronization in the business cycles. Therefore, the analyses are not based only on the cyclical component in the GDP but on a much smoothed variable leading to a stronger framework determining the factors driving business cycle differentials among Euro area and GCC countries and how these factors can evolve through time.

Second, we will try to answer two questions: first, why within a group of economic interest may the business cycles of different countries be synchronous or asynchronous. And second, why they may converge or diverge. To do this, we will include in the analysis a set of factors, which are common in the literature, and for which data are within our reach. They are supposed to have an impact on the synchronization of business cycles.

Third, as we introduce a hybrid model based on wavelets analysis and genetic algorithm to measure business cycles synchronization among countries in the Euro area and GCC countries, we have to justify its relevance in relation with the used variables. Moreover, we try to overcome some problems with the popular approach in business cycle synchronization related to the robustness of tests. Thereby, we will present the difference in the results with a simple denoised signal of wavelets as a dependent variable, and the results with an optimized-denoised signal with the Genetic Algorithm.

The remainder of this paper is structured as follows. Section 2 provides a recent literature review in relation with the potential determinants of business cycle synchronization. Section 3 outlines the empirical analysis, namely the used data, the statistical approach and artificial intelligence techniques and finally the obtained results. Section 4 discusses the economic interpretation of the results in the context of Euro area and GCC countries.

2. Literature Review

The literature on business cycles synchronization is evolving both theoretically and empirically. Because of its diversity, it can be subdivided in several categories (for example, the variables used in the study, the technical packages considered in the analysis, the research context, etc.). Since theory is indeterminate upon which factors are behind synchronization, identifying the determinants of synchronization is thus a subjective matter left to the initiative of the researcher (Baxter and Kouparitsas, 2005).

By considering the research context, the most important part of works on business cycles synchronization is concentrated (in a descending order) on the Euro area, United States and South Asia. Because of a huge number of constraints, the works on GCC countries or the MENA region are still insufficient and need more developments.

Among the various works about the business cycles synchronization, we can cite the following ones:

Frankel and Rose's (1998) work mainly focused on the effects of international trade, Rose and Engel (2002) confirm this statement of fact argued by the intensified trade flows between currency union members. As a result, business cycles are more synchronized across currency union countries. Artise et al. (2004) have presented a Markov Switching VAR models to assess the synchronization process in the European Union and to identify a common unobserved component that determines the European business cycle dynamics.

Camacho et al. (2006) and Harding and Pagan (2006) have discussed how the degree of synchronization between business cycles of different countries can be measured and tested. They conclude that there is no common business cycle across Europe.

Clark and Wincoop (2001) have argued that business cycles of U.S. Census regions are substantially more synchronized than those of European countries.

Baxter and Kouparitsas (2005), Imbs (2004) and Inklaar et al. (2008) have analyzed a set of key variables like international trade flows, specialization, and financial integration and their relation with the synchronization process in both developing and industrialized countries. Imbs concludes that economic regions with strong financial links are significantly more synchronized. Baxter and Kouparitsas argue that currency unions are not important determinants of business cycle synchronization. And Inklaar et al. conclude that convergence in monetary and fiscal policies have a significant impact on business cycle synchronization.

Stockmann (1988) has focused his work on the importance of sectorial shocks for the business cycle and concludes that the degree of differences in sectorial specialization is negatively related to cycle synchronization, i.e. the more dissimilar the economies, the less correlated the cycles.

Kalemli-Ozcan et al. (2003) have argued that countries with a high degree of financial integration tend to have more specialized industrial patterns and less synchronized business cycles. They corroborate their conclusions with the contagion effect of the financial crises and put forward a direct and positive effect of capital flows on business cycle synchronization.

From another point of view, Selover and Jensen (1999) have adopted a mathematical modeling approach to conclude that the world business cycle may result from a mode-locking phenomenon (a nonlinear process by which weak coupling between oscillating systems tends to synchronize oscillations in the systems).

Overall, all the works are concentrated on the two main blocks of variables: *trade or economic specialization* and *financial integration*. Therefore, the literature is ambiguous on the real effect of these blocks of variables on the business cycles synchronization. This is quite understandable since different researchers relay on various research ways. Their results are, however, not unequivocal and seem to depend on the economic structure of the country, the chosen period of time and samples, etc.

3. Empirical Analyses

3.1. Data and variables description

In this paper, we follow fundamentally the work of Baxter and Kouparitsas (2005), and Imbs (2004) with some small modifications to analyze the relationship between business cycle synchronization and the following variables: bilateral trade, trade openness, trade specialization, economic specialization, deposit interest rate differentials, official exchange rate fluctuations, fiscal deficit differential, financial openness, monetary policy, current account balance, Gross national savings as % of GDP, oil imports (only for EU) and oil exports (only for GCC). We also consider introducing two gravity variables to the regression equation, namely geographical distance and population density. As a dependent variable, we use, as usual, the GDP data.

We construct 55 pairs among the 11Euro area countries¹ and 15 pairs among the 6 GCC countries² over the period 1980-2011. In order to extract the specifications and most important events in the considered period, the latter is split into three sub-periods: 1980-1989, 1990-1999 and 2000-2011.

The terminology used in the following equations corresponds to the country indices i and j as well as the time index t. In what follow, we give a description of each variable used in the regression. We classify the considered variables into two sets; the first one concerns the most important determinants of business cycle synchronization proposed by Baxter and Kouparitsas (2005), Imbs (2004) and Inklaar (2005). The second set of variables consists of policy and structural indicators, which appear particularly relevant in the context of an economic and monetary union.

Business cycles synchronization measurement

The dependent variable in our study is the degree of business cycle synchronization between countries i and j at time t. To measure this variable, we follow Inklaar et al. (2005) methodology to conduct regressions with Fisher's z-transformations of the correlation coefficients as dependent variable. The transformed correlation coefficients are calculated as:

$$Syn_{ij} = Corr_{tran,ij} = \frac{1}{2} \ln \left[\frac{1 + Corr_{ij}}{1 - Corr_{ij}} \right]$$

where $Corr_{ij}$ is the pair-wise correlation coefficient of the cyclical components³ of GDP of country i and country j. Since a Pearson's correlation coefficient is bounded at -1 and 1, the error terms in a regression model of the determinants of business cycle synchronization are unlikely to be normally distributed if the untransformed correlation coefficients are used (Inklaar et al, 2005). This complicates reliable inference. The transformed correlations do not suffer from this problem, since the transformation ensures that they are normally distributed (David, 1949).

Business cycle synchronization: fundamental determinants

There is no doubt that the foremost among the determinants of business cycles is the trade intensification. To understand the effect of trade on business cycle synchronization (BCS), we must invoke the Ricardo comparative advantage theory and trade specialization. Increased trade must result in increased sectorial specialization leading to increased business cycle correlation. In addition, trade may act as a conduit for the transmission of shocks that affect all industries (Baxter and Kouparitsas, 2005). In this case, increased trade would lead to increased business cycle correlation, which means a positive relationship between trade and

¹ Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, Netherlands, Portugal and Spain.

² Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and United Arab Emirates.

³ The cyclical component of the GDP date is extracted by the Hodrick-Prescott filter.

BCS. In relation with trade, we consider four variables, namely bilateral trade, trade openness, trade specialization and economic specialization.

We use two essential *bilateral trade* measurements: the first one (*BLTRt*) is defined as the average of the sum of bilateral exports and imports in a pair of countries, divided over the sum of total exports and imports:

$$BLTRt_{ij} = \frac{1}{T} \sum_{t=1}^{I} \left[\frac{(X_{ijt} + M_{ijt}) + (X_{jit} + M_{jit})}{(X_{it} + M_{it}) + (X_{jt} + M_{jt})} \right]$$

The second one (*BLTRy*), expresses bilateral trade as a fraction of aggregate GDP in the two countries:

$$BLTRy_{ij} = \frac{1}{T} \sum_{t=1}^{T} \left[\frac{(X_{ijt} + M_{ijt}) + (X_{jit} + M_{jit})}{Y_{it} + Y_{jt}} \right]$$

The *trade openness*(*TROP*) measure is intended to capture the general openness in a pair of countries. According to Baxter and Kouparitsas (2005), this variable is a good measure of the extent to which the country is exposed to global shocks. Thus, it is possible that higher trade, in the aggregate, leads to more-highly correlated business cycles:

$$TROP_{ij} = \frac{1}{T} \sum_{t=1}^{T} \left[\frac{(X_{it} + M_{it}) + (X_{jt} + M_{jt})}{Y_{it} + Y_{jt}} \right]$$

where X, M and Y denote exports, imports and GDP respectively.

In the theoretical literature, there is a wide common assent about the impact of bilateral trade and market openness on the business cycles. It is supposed to be a positive relationship; it is argued that the more intense trade is between two countries (or the more open to trade), the higher the trade variable, and the more synchronous the business cycles (Baxter and Kouparitsas, 2005). Hence, there are common factors that create spillover effects for more synchronized business cycles between country-pairs.

Trade specialization (*TRSP*) is measured by the cross-country difference between the average shares across time of a particular sector in total exports. To obtain an overall sectorial distance measure for total exports, we calculate the summation of the distances for all sectors. In our case, we have considered three sectors: goods exports, merchandize exports and services exports. The variable is calculated as follow:

$$TRSP_{ij} = \left[\left| \left(\frac{1}{T} \sum_{t=1}^{T} exs_{int} \right) - \left(\frac{1}{T} \sum_{t=1}^{T} exs_{jnt} \right) \right| \right]$$

where exs_{int} is the share of the sector *n* in the total exports of country *i*, at time *t*. Logically, differences in trade specialization patterns should be negatively related to business cycle correlation.

Like trade specialization, *economic specialization* (*ECSP*) expresses the share of an economic sector in the total economic outputs. It is the sum of the differences of sector shares in the economy's output. Here, the three main sectors are considered, agriculture, industry and services. The corresponding variable is calculated as follow:

$$ECSP_{ij} = \left[\left| \left(\frac{1}{T} \sum_{t=1}^{T} ecs_{int} \right) - \left(\frac{1}{T} \sum_{t=1}^{T} ecs_{jnt} \right) \right| \right]$$

where ecs_{int} is the share of the sector *n* in the total economy's output of country *i*, at time *t*. Once again, it is expected to obtain a negative relationship for this variable with business cycle synchronization.

It is noted that *exs_{int}* and *ecs_{int}* are the time average of the discrepancies in the economic structures between two countries.

For the trade and economic specializations, it is expected to have negative coefficients between these variables and business cycles. That is, the more similar the trade and economic structures of two countries, the higher is the cycle correlation.

Business cycle synchronization: specific determinants of economic and currency union

The other set of variables included in the analysis concern those used to assess the available suitable conditions to create an economic and monetary union. We consider the following variables:

Deposit interest rate differentials (*DIRD*) is used to determine whether differences in the monetary policy have an impact on BCS. According to Inklaar (2005), the relationship direction is not clear and is ultimately an empirical matter. This dissonance is justified by the fact that in ordinary periods, countries with similar monetary policy have more synchronized business cycles. But in the case of crisis or external shocks, business cycles may be less correllated due to the inability to respond by individual monetary policy in the presence of policy coordination (Inklaar, 2005). The variable is calculated by taking the absolute value of the mean sample of pair wise differences:

$$DIRD_{ij} = \left| \frac{1}{T} \sum_{t=1}^{T} (DIR_{it} - DIR_{jt}) \right|$$

Official exchange rate fluctuations (*OEXR*) is another important variable to evaluate the relationship between the monetary policy and BCS. The bigger the volatility of the exchange rate, the lesser the synchronization in business cycles. Hence, we expect a negative correlation in this case (Frankel and Rose, 2002). This variable is first calculated by using the standard deviations of the bilateral nominal exchange rates between two countries, and then the standard deviations are scaled by the mean of the bilateral exchange rates over the sample time period:

$$OEXR_sd_{ij} = \frac{\sigma(OEXR_{ijt})}{\frac{1}{T}\sum_{t=1}^{T}OEXR_{ijt}}$$

The literature suggests that the deposit interest rate and the official exchange rate are negatively correlated with business cycles, that is to say highly correlated cycles are recorded in the presence of more similar monetary policy.

Another important variable which can be included is the *Fiscal deficit differential* (*FIDD*). From a theoretical point of view, the direction of the correlation between the fiscal deficit differentials and BCS is, once again, not confirmed. Empirically, the variable is constructed as the mean sample of the bilateral differences of fiscal deficit (*FD*) ratios between two countries, and then taken as the absolute value:

$$FIDD_{ij} = \left| \frac{1}{T} \sum_{t=1}^{T} (FD_{it} - FD_{jt}) \right|$$

In most cases, similar fiscal policies correspond to increased correlation between business cycles. We expect the estimated coefficients to be negative, that is, a larger difference in fiscal deficit leads to less synchronized business cycles (Frankel and Rose, 2002).

Financial openness (*FIOP*) is a measure of capital account openness. We use the Chinn and Ito (2002) to measure the capital account openness, constructed as the first standardized principal component of the International Monetary Fund inverse binary indicators. Here, we measure the bilateral capital account openness as the average period of the sum of the Chinn and Ito's indicators (Chinn and Ito, 2002):

$$FIOP_{ij} = Kaopen_{ij} = \frac{1}{T} \sum_{t=1}^{T} (Kaopen_{it} + Kaopen_{jt})$$

where *Kaopen* is the Chin and Ito's measure of capital account openness. It goes without saying that a more open capital account in a country leads to a more vulnerable situation to global financial shocks or economic crisis. Therefore, countries with high financial openness are likely to have high correlated business cycles (positive coefficients).

Monetary policy (*MOPY*), is expressed by the calculation of the Pearson coefficient of correlation calculated as the money and quasi money annual growth (M2 annual %):

$$MOPY_{ij} = Corr_{ij}(M2_{it}, M2_{jt})$$

Current account balance (*CUAB*) as a percent of GDP is defined as the sum of net exports of goods, services, net income, and net current transfers. To capture the relation between current account balance and BCS, we use the Pearson correlation coefficient between two countries:

 $CUAB_corr_{ij} = Corr_{ij}(CUAB_{it}, CUAB_{jt})$

Gross national savings as % of GDP (*GNSA*) expressed as gross national income less total consumption, plus net transfers.

$$GNSA_corr_{ij} = Corr_{ij}(GNSA_{it}, GNSA_{jt})$$

We expect countries with similar monetary policies, current account balance and gross national savings to experience similar business cycles. Consequently, the estimated regression coefficients on these variables must be positive as regards the business cycles.

By considering the trade in *oil market*, we are confronted with the nature of the economic structure for each country. Because European countries are relatively classified as oil importers, we use the value of oil importations (*OIIM*) as an exogenous variable in the regression model. In contrary, it is more logical to use the value of oil exportations (*OIEX*) for the GCC since their economies are widely dependent on the oil rents:

$$OIIM(EU)_corr_{ij} = Corr_{ij}(OIIM_{it}, OIIM_{jt})$$

$$OIEX(GCC)_corr_{ij} = Corr_{ij}(OIEX_{it}, OIEX_{jt})$$

Logically, countries with a similar profile of oil trading express more correlated business cycles. Then, we expect a positive relationship between oil imports or exports and business cycles synchronization within county-pairs.

We also consider introducing two gravity variables to the regression equation, namely *geographical distance* and *population density*. Geographical distance is expressed in terms of distance between national capitals in kilometer units. And population density is mid year population divided by land area in square kilometers. It is well known that a large fraction of bilateral trade can be explained, in a statistical sense, by a set of gravity variables that include distance between countries, indicator variables for common language and adjacency, and

variables that measure the difference between countries' levels of GDP (Baxter and Kouparitsas, 2005). Therefore, the gravity variables are usually included in the analysis as a set of *always-included* variables. However, it would be necessary to investigate whether the gravity variables are robust explanatory variables for business cycle synchronization in a first stage of analysis.

3.2. Extreme-bounds analysis

In order to precisely identify the main determinants of BCS across Euro area countries and GCC, we adopt a special type of regression called Extreme Bound Analysis (EBA) as proposed by Leamer (1983) and developed by Levine and Renelt (1992), Levine and Zervos (1993), and Sala-i-Martin (1997).

The principal is quite convincing: when we use a simple OLS regression, the estimated coefficients are often unstable and much conditional on the choice of information set. Avariable may appear as significant in one combination of repressors and not significant in another. In others words, a variable is considered robust when its statistical significance is not conditional on the information set, namely on whether other economic variables are included in the equation or not. Consequently, and before deciding if a variable is a robust determinant of BCS or not, we must run an important number of regression combinations. A determinant variable for the BCS must have the same behavior in all combinations (Baxter and Kouparitsas, 2005). The used criteria in robustness check of the entire variables are discussed in more detail in the next sections.

The regression is about a dependent variable Y with various sets of independent variables. In our case, Y is a vector of business cycle expressed as the cyclical component extracted by the Hodrick-Prescott Filter⁴ of the GDP correlations Y_{ij} between pairs of countries *i* and *j*.

The general regression form as presented by Learner (1983) based on the EBA is:

 $Y = \beta_i(I) + \beta_m(M) + \beta_z(Z) + \mu$

The independent variables are classified into three categories, I, M and Z. I denote a set of *always-included* variables (The gravity variables, geographical distance and population density may fall into that group). The M-variable is the candidate variablewhich is being tested for robustness. At the same time, the Z-variables contain other variables identified as potential determinants of BCS.

The EBA is performed by the following algorithm:

- 1. Run a baseline bivariate regression⁵ for each M-variable without any Z variables. A necessary condition for a variable to be a meaningful determinant of BCS is that it should be first significant in a bivariate regression. Otherwise, it is excluded from the analysis.
- 2. Varying the set of Z-variables (for each possible combination) included in the regression for a particular M-variable.
- 3. From these regressions, the EBA determined the highest and lowest values of confidence intervals constructed from the estimated β_m :

⁴ Other researchers, such as Frankel and Rose (1998) and Rose and Engel (2002), have employed a variety of filters in their related investigations. According to Baxter and Kouparitsas (2004), frequently the filter used does not matter importantly for the results.

⁵ In order to get robust estimators for the coefficients of the candidate explanatory variables and avoid heteroskedasticity and auto-correlation in the residuals, we apply to the OLS regressions a Newey-West correction for heteroskedasticity and auto-correlation in the residuals, which is less dependent on large sample properties.

The extreme upper bound (*EUB*) is equal to the maximum estimated β_m plus two times its standard error:

 $EUB = \beta_m^{MAX} + 2\sigma(\beta_m^{MAX})$

The extreme lower bound (*ELB*) is the minimum estimated β_m , minus two times its standard error:

 $ELB = \beta_m^{min} - 2\sigma(\beta_m^{min})$

4. An M-variable is robust if these highest and lowest values are of the same sign and if all estimated β_m coefficients are significant.

EBA robustness test results

Table 1 illustrates a summary of extreme bound analysis applied for both Euro Area and GCC. In parallel, Figure 1 represents the evolution of business cycle synchronization over time based on the average correlation coefficient of BCS. Obviously, the trend is positive for the two sets of countries. Business cycles have increased from 0.88 in the first period to 1.16 in the third period for the Euro Area. The situation is quite different for the GCC, since the coefficient drops down from 0.42 to 0.20 in the second period and rises again to 0.87.

On the one hand, there are many country pairs, which have experienced some interesting change in their degree of synchronization like Austria, Belgium and Ireland, which is not the case of other countries like Finland, Greece and Portugal. In addition, GCC country pairs are very weak and globally they are far from an economic and monetary union. Even for the strongest economies, the index of business cycle synchronization is very low and there is no perspective for any latent predisposing factors for a monetary union. The best values of BCS are for the following countries: Bahrain, Qatar and United Arab Emirates.

Moreover, the European integration is well captured in the third period. It is seen as the period of preparation for the European monetary union.

Other results are shown in Table 2, Figures 2 and 3. The table shows the biggest and lowest correlation coefficients of BCS in Euro area and GCC.

3.3. Wavelets in business cycle synchronization

Undoubtedly seen as a subject in progression, the application of wavelet theory in economics and finance is still in its beginning since wavelets models have not yet been explored in economic and finance literature. Nevertheless, there is a growing interest in applying wavelet theory to deeply understand BCS. The following works are considered among the most important in relation with business cycles: Raihan, Wen and Zeng (2005); Crowley and Lee (2005); Crowley, Maraun and Mayes (2006); Gallegati and Gallegati (2007); Yogo (2008); Aguiar-Conraria and Soares (2009).

Considered as a new engineering tool, wavelet analysis is widely related to applications of image processing, engineering, astronomy, meteorology and time series analysis. We can use them in order to unveil latent processes with changing cyclical patterns, trends and other non-stationary characteristics hence it is supposed to be very appropriate in studying synchronization in business cycles.

In the present study, we will focus on two models of continuous discrete wavelets transformations: the Cross Wavelets Coherence model (CWC) and the Stationary Wavelets Transform model (SWT).

As continuous and discrete in time frequency (scales), these two wavelets models are very appropriate in studying business cycle synchronization by offering the following advantages:

- Wavelets allow the examination of trends and seasonal time series without the need for prior transformations. Therefore, there is no need of any pre-process to deal with deterministic and stochastic trends due to the fact that wavelet filtering usually embeds enough differencing operations.
- Wavelets reduce computational complexity. All the wavelets models (even the most complex ones) can be computed with faster and efficient algorithms (Cohen and Walden, 2010a).
- Wavelets offer a more precise timing of shocks causing and influencing business cycles.
- Wavelets are nonparametric models and they are very suitable to examine nonlinear processes without loss of information.

3.3.1. Wavelets crossing and wavelets coherence

The cross wavelets transform (XWT) and wavelets coherence (WCT) are two other wavelets models allowing for the analysis of the temporal evolution of the frequency content of a given signal or timing series. The application of XWT and WCT to two time series and the cross examination of the two decompositions can reveal localized similarities in *time* and *scale*. Areas in the time-frequency plane where two time series exhibit common power or consistent phase behavior indicate a relationship between the signals (Cohen and Walden, 2010a). In our case, these two models are very appropriate to compare business cycle synchronization across a pair of countries both in terms of evolution in time and degree of synchronization.

In the following two sections, the cross wavelets and wavelets coherence models are presented according to the works of Torrence and Compo (1998), Torrence and Webster (1998), and Grinsted et al. (2004).

Cross Wavelet Transform XWT

Wavelets crossing and wavelets coherence are an extension of the Fourier Coherency Transform. The latter was often used to identify common frequency brands between two time series. Therefore, it is possible to develop a wavelet coherency which could identify both frequency bands and time intervals when the time series are related (Liu 1994).

Unfortunately, in Fourier analysis, it is necessary to smooth the cross spectrum before calculating coherency which is otherwise identically equal to 1. As a result, the used smoothing process in cross-wavelet spectrum was unclear and inadequate to define an appropriate wavelet coherency (Liu 1994).

To avoid this shortcoming, the wavelet coherency is used to maintain a smoothing process in both time and scale, with the amount of smoothing dependent on both the choice of wavelet and the scale.

The cross wavelet transform (XWT) of two time series X_n and Y_n with wavelet transforms $W_n^X(s)$ and $W_n^Y(s)$ is defined as: $W_n^{XY}(s) = W_n^X(s)W_n^{Y*}(s)$. Where * is the complex conjugate of $W_n^Y(s)$, *n* is the time index and *s* is the scale. The cross-wavelet spectrum is complex, and hence one can define the cross-wavelet power as $|W_n^{XY}(s)|$. The complex argument $\arg(W^{XY})$ can be interpreted as the local relative phase between X_n and Y_n in time frequency space. The theoretical cross-wavelet distribution of two time series with theoretical Fourier spectra P_k^X and P_k^Y is given in Torrence and Compo (1998) as:

$$D\left(\frac{|W_n^X(s)W_n^{Y*}(s)|}{\sigma_X\sigma_Y} < p\right) = \frac{Z_\nu(p)}{\nu}\sqrt{P_k^X P_k^Y}$$

Where $Z_{\nu}(p)$ is the confidence level associated with probability p, σ_X and σ_Y are the respective standard deviations. If $\nu = 1$ (real wavelets), $Z_l(95\%) = 2.182$, while if $\nu = 2$ (complex wavelets), $Z_2(95\%) = 3.999$.

Wavelets Coherence Transform (WCT)

As the cross wavelet power is used to reveal areas with high common power, the cross wavelets coherence transform is a second useful technique that can be adapted to evaluate coherency in time frequency space. According to Torrence and Webster (1998), the wavelet coherence of two time series is given by the following formula:

$$R_n^2(s) = \frac{\left|S\left(s^{-1}W_n^{XY}(s)\right)\right|^2}{S\left(s^{-1}|W_n^X(s)|^2\right) \cdot S\left(s^{-1}|W_n^Y(s)|^2\right)}$$

where S is a smoothing operator in both time and scale. Here, the coherency parameter $R_n^2(s)$ is always included between 0 and 1, $(0 \le R_n^2(s) \le 1)$. Hence, wavelet coherence is often seen as a localized correlation coefficient in time frequency space. It is an accurate representation of the normalized covariance between the two time series. Therefore, to assess the statistical significance of the estimated wavelet coherency, the Monte Carlo simulation methods are used, and the confidence interval is defined as the probability that the true wavelet power at a certain time and scale lies within a certain interval along the estimated wavelet power(Torrence and Compo, 1998). The theoretical wavelet power $\sigma^2 P_k$ with the true wavelet power, is defined as $\Psi_s^2(s)$. The confidence interval for $\Psi_s^2(s)$ is then:

$$\frac{2}{\chi_2^2(p/2)}|W_n(s)|^2 \le \Psi_n^2(s) \le \frac{2}{\chi_2^2(1-p/2)}|W_n(s)|^2$$

Where p is the desired significance (p = 0.05 for the95% confidence interval), χ_2^2 is a chisquare distributed variable with two DOFs (degree of freedom) (Jenkins and Watts 1968), and $\chi_2^2(p/2)$ represents the value of χ^2 at p/2.

XWT and WCT results

In what follows, we present the XWT and WTC results in a synthesized way. That is why we will limit the discussion for both Euro Area and GCC countries by taking only the highest five⁶ and lowest five⁷ coefficients of BCS between country-pairs.

According to figures 7a and 7b, most countries in the Euro area have expressed a relative important correlation in term of business cycles with the exception of Greece. The strongest similarities are likely common to the period slightly before 1999 (Euro adoption).

As in (Torrenceand Compo, 1998) and (Grinsted et al, 2004), both XWT and WCT figures have some decisive criteria that may be respected in the results'- interpretation.

In the XWT figures, the 5% significance level against red noise is shown as a thick contour. The black contour designates the 5% significance level estimated by Monte Carlo simulations beta surrogate series. The cone of influence, which indicates the region affected by edge effects, is shown with a thin black line. The relative phase relationship is shown as arrows (with in-phase pointing right, anti-phase pointing left. *The color code for power ranges from blue (low power) to red (high power)*.

In the WTC figures expressing the coherence in the business cycles, the black thick contour designates the 5% significance level estimated by Monte Carlo simulations using beta

⁶*Euro Area*: AUT-BEL, AUT-NLD, BEL-ESP, BEL-FRA, BEL-NLD. *GCC countries*: BHR-ARE, BHR-OMN, BHR-QAT, OMN-QAT, SAU-ARE.

⁷*Euro Area*: AUT-ITA, DEU-ESP, DEU-GRC, DEU-IRL, DEU-NLD *GCC countries*: KWT-OMN, KWT-SAU, OMN-ARE, OMN-SAU, QAT-ARE.

surrogate series. The 5% significance level against red noise is shown as a thick contour. All significant sections show anti-phase behavior. *The color code for coherency ranges from blue (low coherency — close to zero) to red (high coherency — close to one).*

Also, it is important to mention that the economy that is most different in the Euro area is the German economy since there are 5 coefficients, among the 10 lowest ones, that represent business cycles synchronization coefficients between Germany and Finland, Greece, Ireland, Netherlands, and Spain. Greece starts displaying some important zones of correlation starting from 2000, which may coincide with the strongest efforts of Greece to join the Euro area. According to figures, there is a very big important correlation in business cycles in the following country-pairs: Belgium-Netherlands, Greece-Spain, Greece-Ireland, Austria-Belgium and Ireland-Spain.

As mentioned above, the cross-wavelets transformation gives information on the delay, or synchronization, between oscillations or scales between two time-series. Unfortunately, this information is sometimes incomplete because there is always some redundancy in the time-series (Torrence and Compo, 1998). Consequently, wavelets coherence is used to avoid this situation.

While the cross-wavelet transform will tell us if the correlation is significant or not, the wavelet coherence transformation has the advantage of being normalized by the power spectrum of the two time-series (Torrence and Compo, 1998). Hence, all the regions, which represent high likely coherency between two countries, are synonymous of strong local correlation. In other words, countries with common high coherency areas represent strong possibilities of creating very similar business cycles.

Cycles with lowest coherency in the Euro area are recorded in the pairs of countries with less synchronous business cycles, mainly formed by Finland, Greece and Spain. For all the country-pairs, the incoherency was very significant in the period between 1980 and 1988. Paradoxically, some countries have recorded in the time of the monetary union a high level of incoherency especially after 2004, like Belgium-Spain, France-Spain, Greece-Ireland, Ireland-Spain. In general, most of the pairs are characterized a low level of coherence mainly between 1980 and 1995.

Looking at figures 7c and 7d, we observe that business cycles between GCC countries are not very synchronous, even for the neighboring countries. In addition, regions with high coherence are situated at low frequencies. The most synchronized business cycles are between Saudi Arabia and the United Arab Emirates.

Interestingly, for all the GCC countries, the phases aligned at high frequencies are not numerous, the majority of them occurred at low frequencies. In addition, coherency phases are notably scattered in a time interval of two years (on average). In the case of Saudi Arabia and the United Arab Emirates, there are several regions of high coherency both at low frequencies and, specially, at high frequencies (between 1998 and 2008).

It is interesting to mention that in the case of Euro area and even after the last global economic crisis, countries with strong correlation in business cycles have kept almost their main correlation and coherency areas. Contrary to Euro area, it seems like GCC countries have started a new stage of divergence in terms of business cycle synchronization. Furthermore, this divergence stages are situated at a low levels frequency. Hence, GCC countries are far likely from constructing an economic and monetary union at least in the next 5 years.

3.3.2. GA-wavelets model for bcs assessment

Some of the main fields in which SWT can be used are signal de-noising and pattern recognition. As argued by Bradley (2003), one of the biggest problems in using the discrete wavelets transformation (DWT) is the resulting shift-variance from the down-sampling process. Therefore, it is possible to skip the down-sampling process by running a stationary wavelets transformation (SWT). SWT is similar to the DWT except that in SWT, the signal is never sub-sampled and instead, the signal is up-sampled at each level of decomposition. Therefore, SWT is shift-invariant and this is a very important condition in studying business cycle synchronization (Torrenceand Compo, 1998). In addition, the main difference in the denoising process in SWT in comparison with DWT is that in DWT only the approximation coefficients are decomposed, while in the SWT, both the detail and approximation coefficients are decomposed.

Since SWT can overcome two major shortcomings of the DWT, it is seen as an appropriate wavelets model to get a more complex and flexible analysis. So, why should we denoise a signal?

Denoising (also referred to as wavelet shrinkage) is to remove noise as much as possible while preserving useful information as much as possible. The basic noisy signal model as proposed by Guoxiang and Ruizhen (2001) takes the following form:

$$s(x) = f(x) + \xi(x)$$

Where s(x) is the observed signal, f(x) is the original signal, $\xi(x)$ is Gaussian white noise with zero mean and variance σ^2 . The objective of denoising is to suppress the noise part of the signal *s* and to recover *f*.

The principle idea behind *SWT de-noising* is that one can define a *noise threshold* such that variations in the data below the threshold are to be regarded as noise, whereas variations greater than the threshold are regarded as *signal*. The de-noising process is very beneficial in the context of models with regime shifts and other forms of discontinuities or points of non-differentiability (Torrenceand Compo, 1998). In others words, as the noise in a signal is mostly contained in the details of wavelet coefficients, that is, the high frequency range of the signal (Keinert, 2004), if we set the small coefficients to zero, much of the noise will disappear and of course, inevitably, some minor features of the signal will be removed as well or at least, distorted by the process. The denoising procedure can be done in three steps:

- 1. Select a wavelet and a level *n*, apply wavelet/wavelet packet decomposition to the noisy signal to produce wavelet coefficients.
- 2. For each level from l to n, choose a threshold value and apply thresholding to the detail coefficients.
- 3. Perform wavelet/wavelet packet reconstruction to obtain a denoised signal.
- 4. The most widely-used thresholding methods are hard-thresholding:

$$T_{\lambda}(x) = \begin{cases} 1 \ if \ |x| \le \lambda \\ 0 \ otherwise \end{cases}$$

And soft-thresholding (Donoho and Johnstone, 1998; Donoho, 1995):

$$T_{\lambda}(x) = \begin{cases} x - \lambda \text{ if } x > \lambda \\ 0 \text{ if } |x| \le \lambda \\ x + \lambda \text{ if } x < -\lambda \end{cases}$$

Where λ can be calculated by Stein's Unbiased Risk Estimate method:

$$\lambda = \sqrt{2log_e(nlog_2(n))}$$

Where n is the length of the signal. In this study, we used the soft-thresholding approach, because it has been reported that the soft-thresholding is more effective than the hard-thresholding (Gnanadurai and Sadasivam, 2006; Talukder and Harada, 2007).

SWT de-noising process and GA optimization results

After denoising a signal *S*, we get a denoised signal S_d and residuals S_r . As shown in figure 8, the wavelets transformation process in the SWT give us a common non-decimated approximation coefficients *a* for both original and denoised signals. The main difference between these signals after the stationary wavelets transform is the determination of non-decimated details coefficients in the original signal and denoised non-decimated details coefficients in the denoised signal. Usually, it is recommended to use at the most 5 detail coefficients (Torrenceand Compo, 1998).

The two signals are then used in the optimization process introduced by an appropriate genetic algorithm in order to understand if the denoised signal can reach higher levels of the constructed objective function or not.

Optimization process is run with Matlab optimization toolbox. The Optimization Toolbox functions minimize the objective or fitness function. That is, they solve problems of the form min f(x). If we want to maximize f(x), we can minimize -f(x), since the point at which the minimum of -f(x) occurs is the same as the point at which the maximum of f(x) occurs (Matlab wavelets user guide, 2012).

For both Euro area and GCC, we introduce in the GA model the regression equations with Newey-West standard error with the GDP cyclical component as a dependent variable and the considered determinants of the business cycles presented in the previous section. Table 3 summarizes the information about the GA optimization and the obtained results:

As we can see, for both set of countries, the inclusion of a denoised signal in the cyclical component of the GDP doesn't reach a higher value⁸ of fitness function. That is, stationary wavelets transform offer more ability to the genetic algorithm optimization in order to determine if the selected determinants of business cycles are the most appropriate. Since we have selected a set of business cycles variables based on the previous literature, and because all the variables were already validated by previous studies, we have obtained improved results with the inclusion of denoised signal.

In a second stage, we perform a multi objective optimization using multi objective genetic algorithm function (see figure 9).

The goal of the multi objective genetic algorithm is to find a set of solutions in that range (ideally with a good spread). The set of solutions is also known as a Pareto front. All solutions on the Pareto front are optimal (Matlab wavelets user guide, 2012).

The Genetic Algorithm solver assumes the fitness function will take one input x, where x is a row vector with as many elements as the number of variables in the problem. The fitness function computes the value of each objective function and returns these values in a single vector output y (Matlab wavelets user guide, 2012).

The figure 9 plots the Pareto front (limited to any three objectives) at every generation. Given a set of choices and a way of valuing them, the Pareto front is the set of choices that are *Pareto efficient*. As we can see the multi objective optimization between Euro area and GCC gives only 10 points in the Pareto front, most of them are closer to the objective function of the GCC optimization. This result is quite appropriate to conclude that the GCC countries optimization could not reach better levels than the Euro area. This can be explained by two

⁸ In absolute value.

fundamental elements. First, the GCC could not achieve better optimization because the chosen business cycles determinants are not representative in the context of GCC economies (this statement was already confirmed in the EBA analysis). Second, the GCC are less determined than European countries to be engaged in an economic and monetary union. Logically, the second explanation is more relevant since our study has encompassed the most important determinants of business cycles that can act on business cycles. Once again, our study confirms the fact that the GCC could not achieve conditions of a propitious environment for a unique monetary area.

4. Summary and Conclusions

In this paper, we have tried to make a deeper understanding of the relationship between business cycles and the most important economic aggregates used in the literature in two economic groups, namely the Euro area and the GCC. The used variables were mainly based on the bilateral trade and economic specialization as basic determinants, and other specific variables in relation with the financial integration and coherence between countries. In addition, our work has tried to understand the spillover effects of business cycles.

The analyses have also included an Extreme Bound Analysis in order to evaluate the relative influence of every used variable. In addition, business cycles were assessed by two wavelets techniques: the wavelets crossing-coherency transformation and the stationary wavelets transformation. The first technique has identified the main intervals of correlation and coherence between country-pairs for both Euro Area and GCC. The second technique (combined with the Genetic Algorithm) was used to show the possible differences after denoising the business cycles index values and optimizing a created objective function.

The main results have showed that the chosen determinants of business cycles were very appropriate for the Euro area but not for the GCC. The reason was confirmed by the recorded divergence in the economic structure between GCC countries. The only common point of convergence was the oil exportations.

In addition, by considering denoised coefficients of business cycles coefficients, the GCC countries still have divergence in BC either in time or in scale. Paradoxically, the divergence has been increasing after the last global economic crisis.

The use of denoised index offers the advantage of dealing with smoother parameters. The technique is more suitable in the case were business cycles' indexes contain a very important part of noise.

The multi-objective optimization conducted between the Euro area and the GCC has shown that the GCC could not be compared to the Euro area. The latter has expressed very high correlation in business cycles in some country-pairs, contrary to GCC. In addition, most of the countries in the Euro area that were characterized by low index of business cycles have improved their synchronization process overtime, especially after 1999, like Spain, Italia, Greece and Finland. Euro Area countries have many possibilities for the synchronizing of their business cycles both in time and scale. However, GCC countries are still far from approaching an economic and monetary union. Except for Saudi Arabia and the United Arab Emirates, all the other country-pairs dot not represent any convergence possibilities in terms of business cycles.

References

- Aguiar-Conraria L. and M.J. Soares. "Business Cycle Synchronisation Across the Euro Area: A Wavelet Analysis." University of Minho, NIPE Working Papers 8, 2009. http://www3.eeg.uminho.pt/economia/nipe/docs/2009/NIPE_WP_8_2009.pdf
- Artis M., H. M. Krolzig and J. Toro 2004. "The European Business Cycle." Oxford Economic Papers, 56: 1-44.
- Baxter M. and M. Kouparitsas. 2005. "Determinants of Business Cycle Comovement: A Robust Analysis." *Journal of Monetary Economics*, 52: 113-157.
- Bradley. P. 2003. "Shift-invariance in the Discrete Wavelet Transform." Proceedings of the Seventh International Conference on Digital Image Computing: Techniques and Applications: 29-38.
- Camacho M., G. Perez-Quiros and L. Saiz. 2006. "Are European business cycles close enough to be just one?" *Journal of Economics Dynamics and Control*, 30: 1687-1706.
- Chinn M. and H. Ito 2002. "Capital Account Liberalization, Institutions and Financial Development: Cross Country Evidence." National Bureau of Economic Research, Working Paper No 9867.
- Clark T.E. and E. Wincoop. 2001. "Borders and Business Cycles." *Journal of International Economics*, 55: 59-85.
- Cohen E. A. K. and A. T. Walden. 2010a. "A Statistical Analysis of Morse Wavelet Coherence." IEEE *Transactions of Signal Processing*, 58(3): 980-989.
- Crowley P.M. and J. Lee. 2005. "Decomposing the Co-movement of the Business Cycle: A Time-Frequency Analysis of Growth Cycles in the Euro Area." Bank of Finland, Bank of Finland Research Discussion Papers 12.http://www.suomenpankki.fi/en/julkaisut/tutkimukset/keskustelualoitteet/Documents/ 0512netti.pdf
- Crowley P.M., D. Maraun and D. Mayes. 2006. "How Hard Is the Euro Area Core? An Evaluation of Growth Cycles Using Wavelet Analysis." Bank of Finland, Bank of Finland Research Discussion Papers 18. http://www.suomenpankki.fi/en/julkaisut/tutkimukset/keskustelualoitteet/Documents/061 8netti.pdf
- David, F. N. 1949. "The Moments of the z and F Distributions." *Biometrika* 36: 394-403.
- Donoho D. and I. M. Johnstone. 1995. "Adapting to Unknown Smoothness Via Wavelet Shrinkage." *Journal of the American Statistical Association*, 90: 1200-1224.
- Donoho D. L. 1995. "Denoising Via Soft Thresholding." IEEE *Transactions on Information Theory*, 41: 613-627.
- Frankel J. and A. Rose. 2002. "An Estimate of the Effect of Common Currencies on Trade and Income." *Quarterly Journal of Economics*, 117: 437-466.
- Frankel J. and A. Rose. 1998. "The Endogeneity of the Optimum Currency Area Criteria." *Economic Journal*, 108: 1009-1025.
- Gallegati, Marco and Mauro Gallegati. 2007. "Wavelet Variance Analysis of Output in G-7 Countries. Studies in Nonlinear Dynamics and Econometrics." 11(3): art. 6. http://ideas.repec.org/a/bpj/sndecm/v11y2007i3n6.html

- Gnanadurai D. and V. Sadasivam. 2006. "An Efficient Adaptive Thresholding Technique for Wavelet Based Image Denoising." *International Journal of Signal Processing*, 2: 114-120.
- Grinsted1 A., J. C. Moore1 and S. Jevrejeva. 2004. "Application of the Cross Wavelet Transform and Wavelet Coherence to Geophysical Time Series." Nonlinear Processes in *Geophysics in European Geosciences Union*, 11: 561-566.
- Guoxiang S. and Z. Ruizhen. 2001."Three Novel Models of Threshold Estimator for Wavelet Coefficients." WAA 2001, Lecture Notes in Computer Science, 2251: 145-150.
- Harding D. and A. Pagan. 2006. "Synchronization of Cycles." *Journal of Econometrics*, 132: 59-79.
- Imbs J. 2004. "Trade, finance, specialization, and synchronization." *The Review of Economics and Statistics*, 86: 723-734.
- Inklaar R., R. Jong-A-Pin and J. de Haan. 2008. "Trade and Business Cycle Synchronization in OECD countries. A Re-examination." *European Economic Review*, 52: 646-666.
- Jenkins G. M. and D. G. Watts. 1968. "Spectral Analysis and Its Applications". Holden-Day: 525.
- Kalemli-Ozcan S, B.E. Sorensen and O. Yosha. 2003. "Risk Sharing and Industrial Specialization: Regional and International Evidence." *American Economic Review*, 23: 15-21.
- Keinert F. 2004. "Wavelets and Multiwavelets, Studies in Advanced Mathematics." Chapman & Hall/CRC Press, 5: 25-29.
- Kumar D.K., N.D. Pah and A. Bradley. 2003. "Wavelet Analysis of Surface Electromyography to Determine Muscle Fatigue." IEEE Trans. Neural Syst. Rehabil. Eng., 11(4): 400-406.
- Leamer E. 1983. "Let's Take the Con Out of Econometrics." *American Economic Review* 73: 31-43.
- Levine R. and D. Renelt. 1992. "A Sensitivity Analysis of Cross-Country Growth Regressions." *American Economic Review* 82: 942-963.
- Levine R. and S. Zervos. 1993. "Looking at the Facts. What We Know about Policy and Growth from Cross-Country Analysis." World Bank Working Paper WPS 1115.
- Liu P.C. 1994. "Wavelet Spectrum Analysis and Ocean Wind Waves." Wavelets in Geophysics, E. Foufoula-Georgiou and P. Kumar, Eds., Academic Press: 151-166.
- Raihan S.M., Y. Wen and B. Zeng. 2005. "Wavelet: A New Tool for Business Cycle Analysis." Federal Reserve Bank of St. Louis, Working Paper 050A. http://research.stlouisfed.org/wp/more/2005-050/
- Rose A. and C. Engel. 2002. "Currency Unions and International Integration." *Journal of Money, Credit and Banking*, 34: 1067-1089.
- Sala-i-Martin X. 1997. "I Just Ran Two Millions Regressions." *American Economic Review* 87(2): 178-183.
- Selover D. and R. Jensen. 1999. "Mode-locking' and International Business Cycle Transmission." *Journal of Economic Dynamics and Control*, 23: 591-618.
- Stockman A. 1988. "Sectoral and National Aggregate Disturbances to Industrial Output in Seven European Countries." *Journal of Monetary Economics*, 21: 387-409.

- Talukder K. H. and K. Harada. 2007. "Haar Wavelet Based Approach for Image Compression and Quality Assessment of Compressed Image." *IAENG International Journal of Applied Mathematics*, 36: 41-42.
- Torrence C. and G. P. Compo. 1998. "A Practical Guide to Wavelet Analysis." A Practical Guide to Wavelet Analysis, *Bulletin of the American Meteorological Society*, 79: 605-618.
- Torrence C. and P. Webster. 1999. "Interdecadal Changes in the ESNOMonsoon System." *Journal of Climate*, 12: 2679-2690.
- Yogo M. 2008. "Measuring Business Cycles: A Wavelet Analysis of Economic Time Series." Economics Letters, vol. 100(2): 208-212. http://ideas.repec.org/a/eee/ecolet/v100y2008i2p208-212.html



Figure 1: Business Cycle Correlation over Time

Figure 2: Business Cycle Synchronization in the Euro Area (1980-2011)





Figure 3: Business Cycle Synchronization in the GCC (1980-2011)

Figure 4: Largest and Smallest Ten Business Cycle Synchronisation for the Euro Area from 1980-2011





Figure 5: Business Cycle Synchronisation for the GCC from 1980-2011



Figure 6(a): Business Cycle Components Extracted by the HP Filter (Euro Area)





Notes: The line graphs are based on annual real GDP series and show the cyclical GDP component, scaled by overall GDP.



Figure 6(b): Business Cycle Components Extracted by the HP Filter (GCC countries)

Notes: The line graphs are based on annual real GDP series and show the cyclical GDP component, scaled by overall GDP.



Figure 7a: XWT and WTC for the 10 Highest BCS Coefficient in Euro Area

Figure 7a: Continued





Figure 7b: XWT and WTC for the 10 lowest BCS coefficient in Euro Area

Figure 7b: Continued





Figure 7c: XWT and WTC for the 5 highest BCS coefficient in GCC



Figure 7c: XWT and WTC for the 5 lowest BCS coefficient in GCC



Figure 8: Stationary Wavelets Transform applied to denoise c_gdp component







Figure. SWT for France c_gdp



Figure. SWT for Germany c_gdp











Figure. SWT for Netherlands c_gdp



















Figure. SWT for United Arab Emirates c_gdp component



Figure 9: GA-Wavelets Optimization Applied on the Cyclical Business Cycle Synchronization Index

Table 1: EBA Analysis Results

		Euro Area			GCC	
Variables	1980-1989	1990-1999	2000-2011	1980-1989	1990-1999	2000-2011
Fundamental determinants of business	cycle synchroni	zation				
Bilateral Trade <i>BLTRt</i> (Trade criteria)	Robust (+)	Robust (+)	Robust (+)	Fragile	Fragile	Fragile Significant +
Bilateral trade <i>BLTR</i> y (GDP criteria)	Robust (+)	Robust (+)	Robust (+)	Fragile	Fragile	Fragile
Trade openness TROP	Quasi Robust(+)	Robust (+)	Robust (+)	Fragile Significant+	Fragile	Fragile
Trade specialization TRSP	Quasi- Robust(-)	Robust (-)	Robust (-)	Quasi- Robust(-)	Robust (-)	Fragile
Economic specialization ECSP	Robust (-)	Robust (-)	Quasi- Robust(-)	Fragile	Fragile	Fragile
Specific determinants of economic and Deposit interest rates differentials DRID	currency union Robust (-)	Robust (-)	Fragile	Quasi-Robust (+)	Fragile	Fragile
Official exchange rate fluctuations OEXR	Robust (-)	Robust (-)	Fragile	Fragile Significant-	Fragile Significant-	Fragile Significant-
Fiscal deficit differentials FIDD	Robust (-)	Robust (-)	Robust (-)	Quasi- Robust(-)	Fragile Significant-	Quasi- Robust(-)
Financial openness FIOP	Fragile	Quasi- Robust(+)	Robust (+)	Fragile	Fragile	Fragile
Monetary policy MOPY	Robust (+)	Fragile	Robust (+)	Quasi-Robust (+)	Fragile	Quasi- Robust (+)
Current Account Balance CUAB	Robust (+)	Robust (+)	Robust (+)	Robust (+)	Quasi- Robust (+)	Quasi- Robust (+)
Gross national savings % of GDP GNSA	Robust (+)	Robust (+)	Robust (+)	Fragile Significant+	Fragile	Fragile
Oil imports OIIM (only EA)	Quasi- Robust(+)	Robust (+)	Robust (+)			
Oil exports OIEX (only GCC)				Robust (+)	Robust (+)	Robust (+)
Gravity variables						
Geographical distance GEOD	Robust (-)	Robust (-)	Robust (-)	Robust (-)	Robust (-)	Robust (-)
Population density PODE	Robust (+)	Fragile Significant+	Robust (+)	Fragile Significant+	Robust (+)	Fragile Significant +

Fragile significant with + or - signs indicate that the variable is significant only in the bivariate regression

Table 2: Correlation Matrix of Business Cycles between Countries (1980-2011)

	AUT	BEL	FIN	FRA	DEU	GRC	IRL	ITA	NLD	PRT	ESP
AUT	1.0000										
BEL	0.8529	1.0000									
FIN	0.5918	0.6365	1.0000								
FRA	0.7588	0.8496	0.7509	1.0000							
DEU	0.5572	0.5570	-0.0055	0.4929	1.0000						
GRC	0.6374	0.6415	0.6586	0.6938	0.0517	1.0000					
IRL	0.7706	0.7836	0.7096	0.7451	0.1118	0.8658	1.0000				
ITA	0.5321	0.7188	0.5621	0.8561	0.5903	0.5123	0.5583	1.0000			
NLD	0.8507	0.9089	0.5522	0.7408	0.5194	0.5870	0.7829	0.6258	1.0000		
PRT	0.5708	0.7335	0.2501	0.7288	0.6305	0.3788	0.5456	0.7390	0.7659	1.0000	
ESP	0.7781	0.8168	0.7866	0.9024	0.2888	0.9061	0.8593	0.6993	0.7659	0.5570	1.0000
	BHR	KWT	OMN	QAT	SAU	ARE					
BHR	1.0000										
KWT	0.5359	1.0000									
OMN	0.5771	0.1206	1.0000								
QAT	0.7346	0.3360	0.7421	1.0000							
SAU	0.5212	0.2410	0.0940	0.3859	1.0000						
ARE	0.7422	0.4587	0.1064	0.3120	0.6935	1.0000					

Notes: The highest coefficients and the lowest ones are in green bold and red bold respectively

Table 3: GA Optimization Variables

	Signal	Optimization equations (maximization)	Fitness function best value	Fitness function mean value)
Euro Area	Original c_gdp	$\begin{array}{l} c_gdp = \\ a_1(bltrt) + a_2(bltry) + a_3(trop) + a_4(trasp) + a_5(escp) + a_6(drid) + \\ a_7(oexr) + a_8(fidd) + a_9(fiop) + a_{10}(mopy) + a_{11}(cuab) + a_{12}(gns a) + a_{13}(oiim) + a_{14}(geod) + a_{15}(pode) \end{array}$	-867469265,6499	-867346754,3949
optimization	Denoised c_gdp	$\begin{array}{l} c_gdp_{d} \\ = a_{1}(bltrt) + a_{2}(bltry) + a_{3}(trop) + a_{4}(trasp) + a_{5}(escp) + a_{6}(drid) \\ + a_{7}(oexr) + a_{8}(fidd) + a_{9}(fiop) + a_{10}(mopy) + a_{11}(cuab) + a_{12}(gnsa) + a_{13}(oiim) + a_{14}(geod) + a_{15}(pode) \end{array}$	-970,5855	-970,4424
GCC	Original c_gdp	$\begin{array}{l} c_gdp \\ = a_1(bltrt) + a_2(bltry) + a_3(trop) + a_4(trasp) + a_5(escp) + a_6(drid) \\ + a_7(oexr) + a_8(fidd) + a_9(fiop) + a_{10}(mopy) + a_{11}(cuab) + a_{12}(gnsa) + a_{13}(oiex) + a_{14}(geod) + a_{15}(pode) \end{array}$	-18835,3291	-18833.9236
optimization	Denoised c_gdp	$\begin{array}{l} c_gdp_d \\ = a_1(bltrt) + a_2(bltry) + a_3(trop) + a_4(trasp) + a_5(escp) + a_6(drid) \\ + a_7(oexr) + a_8(fidd) + a_9(fiop) + a_{10}(mopy) + a_{11}(cuab) + a_{12}(gns_a) + a_{13}(oiex) + a_{14}(geod) + a_{15}(pode) \end{array}$	-16444,6133	-16440.0384
Euro Area & GCC Pareto multi-	Denoised c_gdp_Euro	$\begin{array}{l} c_gdp_d \\ = a_1(bltrt) + a_2(bltry) + a_3(trop) + a_4(trasp) + a_5(escp) + a_6(drid) \\ + a_7(oexr) + a_8(fidd) + a_9(fiop) + a_{10}(mopy) + a_{11}(cuab) + a_{12}(gns_a) + a_{13}(oiim) + a_{14}(geod) + a_{15}(pode) \end{array}$		
objective optimization	Denoised c_gdp_GCC	$\begin{array}{l} c_gdp_d \\ = a_1(bltrt) + a_2(bltry) + a_3(trop) + a_4(trasp) + a_5(escp) + a_6(drid) \\ + a_7(oexr) + a_8(fidd) + a_9(fiop) + a_{10}(mopy) + a_{11}(cuab) + a_{12}(gns_a) + a_{13}(oiex) + a_{14}(geod) + a_{15}(pode) \end{array}$		

					ci unu muan	1000000000000000000000000000000000000		
Dvar = c_gdp	X = [ge	od pode]	Z = [bltry	trop trsp ecs	sp drid oexr	fidd fiop mopy c	uab gnsa oiim]	CI 95%
Estim.	Bounds	Coeff.β	Std. Erro.	t	p-val	N. comb	% sign. coeff.	Result
Bivar Reg.	-	4.6388	2.0949	2.2100	0.0310	-	-	-
EB Min	1.4404	6.2148	2.3872	2.6034	0.2335	66 doubles	133.98%	Robust
EB Max	11.1017	6.2971	2.4023	2.6213	0.2320	00 doubles	135.75%	Robust
EB Min	1.1328	5.8856	2.3764	2.4767	0.2443	220 triplate	126.88%	Pobust
EB Max	11.6649	6.7607	2.4521	2.7571	0.2215	220 triplets	145.74%	Kobusi
	D	L CEDA		e: 1 1	, , ,	NUE 10		
Dwan - a adn	Re V – las	sult of EBA o	on bltry at .75 co 7 = 1000	onfidence lev	el and maxi	mum VIF = 10 fidd fion mony (wah anga ajiml	CT 059/
Dvar = c_gup	A = [gt	Coeff R	$\Sigma = [DIIII]$	trop trsp ec	sp unu oexr	N comb	uab giisa olillij	Docult
Diver Deg	Dounus	12 3560	2 0621	3 1200	0.0030	IV. Comb	70 sign, coen.	Kesuit
EP Min	3 2861	12.3300	4 5504	2 7208	0.0030	-	100 40%	-
EB Max	26.9110	15 9038	5 5036	2.7208	0.2242	66 doubles	128 71%	Robust
EB Min	3 2324	12 4585	4 6131	2.007	0.2258		100.83%	
EB Max	27.0332	16.6492	5.1920	3.2067	0.1924	220 triplets	134.75%	Robust
	Re	sult of EBA o	on trop at .70 co	nfidence lev	el and maxiı	num VIF = 10		
Dvar = c_gdp	X = [ge	od pode]	$\mathbf{Z} = [\mathbf{b}\mathbf{l}\mathbf{t}\mathbf{r}\mathbf{t}\mathbf{b}]$	oltry trsp ecs	p drid oexr	fidd fiop mopy c	uab gnsa oiim]	CI 95%
Estim.	Bounds	Coeff.ß	Std. Erro.	t	p-val	N. comb	% sign. coeff.	Result
Bivar Reg.	-	1.6196	0.6527	2.4800	0.0160	-	-	-
EB Min	-0.0275	1.6828	0.8552	1.9678	0.2993	66 doubles	103.90%	Fragile
EB Max	3.5256	1.8554	0.8351	2.2218	0.2692		114.56%	8
EB Min	-0.0184	1.6023	0.8103	1.9773	0.2981	220 triplets	98.93%	Fragile
EB Max	3.5333	1.9463	0.7935	2.4528	0.2465	· · · ·	120.17%	
	Pa	cult of FRA	on tren at 55 co	nfidanca lav	l and mavir	num VIE – 10		
Dvar = c odn	X = [geo	suit of EDA (od node]	Z = [b]trtb]	linuence ievo Itrv tron ecs	n drid oevri	fidd fion mony ci	uah onsa niim]	CI 95%
Estim.	Bounds	Coeff.B	Std. Erro.	t	p unu ocar i p-val	N. comb	% sign. coeff.	Result
Biyar Reg		-1 4493	0.9468	-1 5300	0.1320	-	, o signi coonit	-
EB Min	-2.8832	-1.0986	0.8923	-1.2312	0.1320		75 80%	
EB Max	0.6527	-1.1745	0.9136	-1.2856	0.4209	66 doubles	81.04%	Fragile
EB Min	-2.7631	-1.0393	0.8619	-1.2058	0.4408		71.71%	
EB Max	0.5657	-1.2239	0.8948	-1.3678	0.4019	220 triplets	84.45%	Fragile
	Re	sult of EBA o	on ecsp at .65 co	nfidence lev	el and maxin	num VIF = 10		
Dvar = c_gdp	Re X = [ge	sult of EBA o od pode]	on ecsp at .65 co Z = [bltrt]	nfidence leve oltry trop tre	el and maxii sp drid oexr	num VIF = 10 fidd fiop mopy c	cuab gnsa oiim]	CI 95%
Dvar = c_gdp Estim.	Re X = [ge Bounds	sult of EBA α od pode] Coeff.β	on ecsp at .65 co Z = [bltrt l Std. Erro.	nfidence leve oltry trop try t	el and maxii sp drid oexr p-val	num VIF = 10 fidd fiop mopy o N. comb	uab gnsa oiim] % sign. coeff.	CI 95% Result
Dvar = c_gdp Estim. Bivar Reg.	Re X = [ge Bounds	sult of EBA of od pode] Coeff.β -0.0219	on ecsp at .65 co Z = [bltrt Std. Erro. 0.0139	nfidence leve oltry trop tro t -2.5800	el and maxin sp drid oexr p-val 0.0200	num VIF = 10 fidd fiop mopy c N. comb	cuab gnsa oiim] % sign. coeff. -	CI 95% Result
Dvar = c_gdp Estim. Bivar Reg. EB Min	Re X = [ge Bounds - -0.0460	sult of EBA (od pode] Coeff.β -0.0219 -0.0262	on ecsp at .65 co Z = [bltrt l Std. Erro. 0.0139 0.0099	nfidence leve oltry trop tro t -2.5800 -2.6524	el and maxin sp drid oexr p-val 0.0200 0.1465	num VIF = 10 fidd fiop mopy c N. comb - 66 doubles	:uab gnsa oiim] % sign. coeff. - 119.68%	CI 95% Result - Fragile
Dvar = c_gdp Estim. Bivar Reg. EB Min EB Max	Re X = [ge Bounds -0.0460 -0.0084	sult of EBA of od pode] Coeff.β -0.0219 -0.0262 -0.0301	on ecsp at .65 co Z = [bltrt l Std. Erro. 0.0139 0.0099 0.0109	nfidence leve oltry trop tro -2.5800 -2.6524 -2.7682	el and maxin sp drid oexr p-val 0.0200 0.1465 0.1277	num VIF = 10 fidd fiop mopy o N. comb - 66 doubles	cuab gnsa oiim] % sign. coeff. - 119.68% 137.50%	CI 95% Result - Fragile
Dvar = c_gdp Estim. Bivar Reg. EB Min EB Max EB Min	Re X = [ge Bounds -0.0460 -0.0084 -0.0449	sult of EBA of od pode] Coeff.β -0.0219 -0.0262 -0.0301 -0.0260	bn ecsp at .65 co Z = [bltrt 1 Std. Erro. 0.0139 0.0099 0.0109 0.0094	nfidence leve oltry trop tra -2.5800 -2.6524 -2.7682 -2.7544	el and maxin sp drid oexr p-val 0.0200 0.1465 0.1277 0.1298	num VIF = 10 fidd fiop mopy o N. comb - 66 doubles 220 triplets	uab gnsa oiim] % sign. coeff. - 119.68% 137.50% 118.77%	CI 95% Result - Fragile
Dvar = c_gdp Estim. Bivar Reg. EB Min EB Max EB Min EB Max	Re X = [ge Bounds -0.0460 -0.0084 -0.0449 -0.0088	sult of EBA of od pode] Coeff.β -0.0219 -0.0262 -0.0301 -0.0260 -0.0296	bn ecsp at .65 co Z = [bltrt 1 Std. Erro. 0.0139 0.0099 0.0109 0.0094 0.0104	nfidence leve oltry trop tr -2.5800 -2.6524 -2.7682 -2.7544 -2.8507	el and maxin sp drid oexr p-val 0.0200 0.1465 0.1277 0.1298 0.1154	num VIF = 10 fidd fiop mopy c N. comb - 66 doubles 220 triplets	uab gnsa oiim] % sign. coeff. - 119.68% 137.50% 118.77% 135.21%	CI 95% Result Fragile Fragile
Dvar = c_gdp Estim. Bivar Reg. EB Min EB Max EB Min EB Max	Re X = [ge Bounds -0.0460 -0.0084 -0.0449 -0.0088	sult of EBA (od pode] Coeff.β -0.0219 -0.0262 -0.0301 -0.0260 -0.0296	on ecsp at .65 co Z = [bltrt l Std. Erro. 0.0139 0.0099 0.0109 0.0094 0.0104	nfidence lev oltry trop tr -2.5800 -2.6524 -2.7682 -2.7544 -2.8507	el and maxin sp drid oexr p-val 0.0200 0.1465 0.1277 0.1298 0.1154	num VIF = 10 fidd fiop mopy o N. comb - 66 doubles 220 triplets	ruab gnsa oiim] % sign. coeff. 	CI 95% Result Fragile Fragile
Dvar = c_gdp Estim. Bivar Reg. EB Min EB Max EB Min EB Max	Re X = [ge Bounds -0.0460 -0.0084 -0.0449 -0.0088	sult of EBA (od pode) Coeff.β -0.0219 -0.0262 -0.0301 -0.0260 -0.0296 sult of EBA (od pode)	on ecsp at .65 co Z = [bltrt l Std. Erro. 0.0139 0.0099 0.0109 0.0094 0.0104 on drid at .70 co Z = [bltrt l	nfidence leve oltry trop tro t -2.5800 -2.6524 -2.7682 -2.7544 -2.8507 nfidence leve oltry trop tro	el and maxin sp drid oexr p-val 0.0200 0.1465 0.1277 0.1298 0.1154 el and maxin sp crsp oexr	num VIF = 10 fidd fiop mopy o N. comb - 66 doubles 220 triplets num VIF = 10 fidd fiop mony o	ruab gnsa oiim] % sign. coeff. 119.68% 137.50% 118.77% 135.21%	CI 95% Result Fragile Fragile
Dvar = c_gdp Estim. Bivar Reg. EB Min EB Max EB Min EB Max Dvar = c_gdp Estim.	Re X = [ge Bounds -0.0460 -0.0084 -0.0449 -0.0088	sult of EBA (od pode) Coeff.β -0.0219 -0.0262 -0.0301 -0.0260 -0.0296 sult of EBA (od pode] Coeff.β	n ecsp at .65 co Z = [bltrt l Std. Erro. 0.0139 0.0099 0.0109 0.0094 0.0104 n drid at .70 co Z = [bltrt l Std. Erro.	nfidence lev oltry trop tre t -2.5800 -2.6524 -2.7682 -2.7544 -2.8507 nfidence lev oltry trop tres t	el and maxin sp drid oexr p-val 0.0200 0.1465 0.1277 0.1298 0.1154 el and maxin sp ecsp oexr n-val	num VIF = 10 fidd fiop mopy o N. comb - 66 doubles 220 triplets num VIF = 10 fidd fiop mopy o N. comb	uab gnsa oiim] % sign. coeff. 119.68% 137.50% 118.77% 135.21% uab gnsa oiim] % sign. coeff.	CI 95% Result Fragile Fragile CI 95% Result
Dvar = c_gdp Estim. Bivar Reg. EB Min EB Max EB Min EB Max Dvar = c_gdp Estim. Bivar Reg	Re X = [ge Bounds -0.0460 -0.0084 -0.0449 -0.0088 Re X = [ge Bounds	sult of EBA (od pode) Coeff.β -0.0219 -0.0262 -0.0301 -0.0260 -0.0296 sult of EBA (od pode] Coeff.β -0.0314	m ecsp at .65 co Z = [bltrt 1 Std. Erro. 0.0139 0.0099 0.0094 0.0094 0.0104 m drid at .70 co Z = [bltrt 1 Std. Erro. 0.0125	nfidence levo bltry trop trs t -2.5800 -2.6524 -2.7682 -2.7544 -2.8507 nfidence levo bltry trop trs t t -2.5000	el and maxin sp drid oexr p-val 0.0200 0.1465 0.1277 0.1298 0.1154 el and maxin sp ecsp oexr p-val 0.0390	num VIF = 10 fidd fiop mopy of N. comb - 66 doubles 220 triplets num VIF = 10 fidd fiop mopy of N. comb	2000 gnsa oiim] % sign. coeff. 119.68% 137.50% 118.77% 135.21% 2000 gnsa oiim] % sign. coeff.	CI 95% Result Fragile Fragile CI 95% Result
Dvar = c_gdp Estim. Bivar Reg. EB Min EB Max EB Min EB Max Dvar = c_gdp Estim. Bivar Reg. EB Min	Re X = [ge Bounds -0.0460 -0.0084 -0.0088 -0.0088 Re X = [ge Bounds -0.0958	sult of EBA (od pode] <u>Coeff.β</u> -0.0219 -0.0262 -0.0301 -0.0260 -0.0296 sult of EBA (od pode] <u>Coeff.β</u> -0.0314 -0.0501	m ecsp at .65 co Z = [bltrt 1 Std. Erro. 0.0139 0.0099 0.0109 0.0094 0.0104 m drid at .70 co Z = [bltrt 1 Std. Erro. 0.0125 0.0229	nfidence leve oltry trop tre t -2.5800 -2.6524 -2.7682 -2.7544 -2.8507 nfidence leve oltry trop tre t -2.5000 -2.1919	el and maxin sp drid oexr p-val 0.0200 0.1465 0.1277 0.1298 0.1154 el and maxin sp ecsp oexr p-val 0.0390 0.2725	num VIF = 10 fidd fiop mopy o N. comb - 66 doubles 220 triplets num VIF = 10 fidd fiop mopy o N. comb	2.uab gnsa oiim] % sign. coeff. 119.68% 137.50% 118.77% 135.21% 2.uab gnsa oiim] % sign. coeff. 159.67%	CI 95% Result Fragile Fragile CI 95% Result
Dvar = c_gdp Estim. Bivar Reg. EB Min EB Max EB Min EB Max Dvar = c_gdp Estim. Bivar Reg. EB Min EB Max	Re X = [ge Bounds -0.0460 -0.0084 -0.0088 -0.0088 Re X = [ge Bounds -0.0958 -0.0089	sult of EBA (od pode) Coeff.β -0.0219 -0.0262 -0.0301 -0.0260 -0.0296 -0.0296 sult of EBA (od pode) Coeff.β -0.0314 -0.0501 -0.0562	n ecsp at .65 co Z = [bltrt l Std. Erro. 0.0139 0.0099 0.0109 0.0094 0.0104 n drid at .70 co Z = [bltrt l Std. Erro. 0.0125 0.0229 0.0237	nfidence lev oltry trop tre t -2.5800 -2.6524 -2.7682 -2.7544 -2.8507 nfidence lev oltry trop trs t -2.5000 -2.1919 -2.3742	el and maxin sp drid oexr p-val 0.0200 0.1465 0.1277 0.1298 0.1154 el and maxin sp ecsp oexr p-val 0.0390 0.2725 0.2538	num VIF = 10 fidd fiop mopy of N. comb - 66 doubles 220 triplets 220 triplets num VIF = 10 fidd fiop mopy of N. comb - 66 doubles	2020 gnsa oiim] % sign. coeff. 119.68% 137.50% 118.77% 135.21% 2020 gnsa oiim] % sign. coeff. - 159.67% 179.11%	CI 95% Result Fragile Fragile CI 95% Result
Dvar = c_gdp Estim. Bivar Reg. EB Min EB Max EB Min EB Max Dvar = c_gdp Estim. Bivar Reg. EB Min EB Max EB Min	Re X = [ge Bounds -0.0460 -0.0084 -0.0088 -0.0088 Re X = [ge Bounds -0.0958 -0.0089 -0.0976	sult of EBA (od pode) <u>Coeff.β</u> -0.0219 -0.0262 -0.0301 -0.0296 -0.0296 -0.0296 -0.0296 -0.0314 -0.0314 -0.0501 -0.0562 -0.0520	n ecsp at .65 co Z = [bltrt] Std. Erro. 0.0139 0.0099 0.0109 0.0094 0.0104 n drid at .70 co Z = [bltrt] Std. Erro. 0.0125 0.0229 0.0237 0.0228	nfidence lev oltry trop tre t -2.5800 -2.6524 -2.7682 -2.7544 -2.8507 -2.5007 -0.1919 -2.3742 -2.2813	el and maxin sp drid oexr p-val 0.0200 0.1465 0.1277 0.1298 0.1154 el and maxin sp ecsp oexr p-val 0.0390 0.2725 0.2538 0.2630	num VIF = 10 fidd fiop mopy o N. comb - 66 doubles 220 triplets 220 triplets num VIF = 10 fidd fiop mopy o N. comb - 66 doubles	cuab gnsa oiim] % sign. coeff. 119.68% 137.50% 137.50% 118.77% 135.21% 35.21% cuab gnsa oiim] % sign. coeff. - - 159.67% 179.11% 165.73% -	CI 95% Result Fragile Fragile CI 95% Result
Dvar = c_gdp Estim. Bivar Reg. EB Min EB Max EB Min EB Max Dvar = c_gdp Estim. Bivar Reg. EB Min EB Max EB Min EB Max	Re X = [ge Bounds - -0.0460 - -0.0084 - -0.0088 - -0.0088 - - - <tr td=""></tr>	sult of EBA (od pode) Coeff.β -0.0219 -0.0262 -0.0301 -0.0296 -0.0296 -0.0296 -0.0296 -0.0314 -0.0314 -0.0501 -0.0562 -0.0520 -0.0578	n ecsp at .65 co Z = [bltrt] Std. Erro. 0.0139 0.0099 0.0109 0.0094 0.0104 m drid at .70 co Z = [bltrt] Std. Erro. 0.0125 0.0229 0.0237 0.0228 0.0239	nfidence lev oltry trop tre t -2.5800 -2.6524 -2.7682 -2.7544 -2.8507 	el and maxin sp drid oexr p-val 0.0200 0.1465 0.1277 0.1298 0.1154 el and maxin sp ecsp oexr p-val 0.0390 0.2725 0.2538 0.2630 0.2494	num VIF = 10 fidd fiop mopy of N. comb - 66 doubles 220 triplets - fidd fiop mopy of N. comb - 66 doubles 220 triplets	cuab gnsa oiim] % sign. coeff. 119.68% 137.50% 137.50% 118.77% 135.21% 35.21% cuab gnsa oiim] % sign. coeff. - - 159.67% 179.11% 165.73% 184.21%	CI 95% Result Fragile Fragile CI 95% Result Robust Robust
Dvar = c_gdp Estim. Bivar Reg. EB Min EB Max EB Min EB Max Dvar = c_gdp Estim. Bivar Reg. EB Min EB Max EB Min EB Max	Re X = [ge Bounds - -0.0460 - -0.0084 - -0.0088 - -0.0088 - -0.0098 - -0.0958 - -0.0976 - -0.0100 -	sult of EBA (od pode) Coeff.β -0.0219 -0.0262 -0.0301 -0.0296 -0.0296 -0.0296 -0.0296 -0.0314 -0.0501 -0.0562 -0.0578	on ecsp at .65 co Z = [bltrt l Std. Erro. 0.0139 0.0099 0.0109 0.0094 0.0104 m drid at .70 co Z = [bltrt l Std. Erro. 0.0125 0.0229 0.0237 0.0228 0.0239	nfidence lev oltry trop tre t -2.5800 -2.6524 -2.7682 -2.7544 -2.8507 -2.8507 -2.1919 -2.3742 -2.2813 -2.4207	el and maxin sp drid oexr p-val 0.0200 0.1465 0.1277 0.1298 0.1154 el and maxin sp ecsp oexr p-val 0.0390 0.2725 0.2538 0.2630 0.2494	num VIF = 10 fidd fiop mopy of N. comb - 66 doubles 220 triplets num VIF = 10 fidd fiop mopy of N. comb - 66 doubles 220 triplets	2020 gnsa oiim] % sign. coeff. 119.68% 137.50% 118.77% 135.21% 2020 gnsa oiim] % sign. coeff. - 159.67% 179.11% 165.73% 184.21%	CI 95% Result - Fragile Fragile CI 95% Result - Robust Robust
Dvar = c_gdp Estim. Bivar Reg. EB Min EB Max EB Min EB Max Dvar = c_gdp Estim. Bivar Reg. EB Min EB Max EB Min EB Max	Re X = [ge Bounds - -0.0460 - -0.0084 - -0.0088 - -0.0088 - -0.0978 - -0.0976 - -0.0100 -	sult of EBA (od pode) Coeff.β -0.0219 -0.0262 -0.0301 -0.0296 -0.0296 -0.0296 -0.0296 -0.0314 -0.0501 -0.0562 -0.0578 -0.0578 -0.0578	on ecsp at .65 co Z = [bltrt] Std. Erro. 0.0139 0.0099 0.0109 0.0094 0.0094 0.0104 m drid at .70 co Z = [bltrt] Std. Erro. 0.0125 0.0229 0.0223 0.0228 0.0228 0.0228 0.0228 0.0228	nfidence lev oltry trop tre t -2.5800 -2.6524 -2.7682 -2.7544 -2.8507 -2.8507 -2.1919 -2.3742 -2.2813 -2.4207 nfidence lev	el and maxin sp drid oexr p-val 0.0200 0.1465 0.1277 0.1298 0.1154 el and maxin sp ecsp oexr p-val 0.0390 0.2725 0.2538 0.2630 0.2494 el and maxin	num VIF = 10 fidd fiop mopy of N. comb - 66 doubles 220 triplets - fidd fiop mopy of N. comb - 66 doubles 220 triplets -	2020 gnsa oiim] % sign. coeff. 119.68% 137.50% 118.77% 135.21% 2020 gnsa oiim] % sign. coeff. - 159.67% 179.11% 165.73% 184.21%	CI 95% Result Fragile Fragile CI 95% Result Robust Robust
Dvar = c_gdp Estim. Bivar Reg. EB Min EB Max EB Min EB Max Dvar = c_gdp Estim. Bivar Reg. EB Min EB Max EB Min EB Max	Re X = [ge Bounds - -0.0460 - -0.0084 - -0.0088 - -0.0088 - -0.0978 - -0.0976 - -0.0100 -	sult of EBA (od pode) Coeff.β -0.0219 -0.0262 -0.0301 -0.0296 -0.0296 -0.0296 -0.0296 -0.0314 -0.0501 -0.0562 -0.0578 -0.0578 -0.0578	on ecsp at .65 co Z = [bltrt] Std. Erro. 0.0139 0.0099 0.0109 0.0094 0.0094 0.0104 m drid at .70 co Z = [bltrt] Std. Erro. 0.0125 0.0229 0.0223 0.0228 0.0228 0.0228 0.0228 0.0228 0.0228 0.0228	nfidence lev oltry trop tre t -2.5800 -2.6524 -2.7682 -2.7544 -2.8507 -2.8507 -2.1919 -2.3742 -2.2813 -2.4207 -2.4207	el and maxin sp drid oexr p-val 0.0200 0.1465 0.1277 0.1298 0.1154 el and maxin sp ecsp oexr p-val 0.0390 0.2725 0.2538 0.2630 0.2494 el and maxin sp ecsp drid	num VIF = 10 fidd fiop mopy of N. comb - 66 doubles 220 triplets - num VIF = 10 fidd fiop mopy of 220 triplets 220 triplets - fidd fiop mopy of fidd fiop mopy of	cuab gnsa oiim] % sign. coeff. 119.68% 137.50% 118.77% 135.21% cuab gnsa oiim] % sign. coeff. ruab gnsa oiim] - 159.67% 179.11% 165.73% 184.21%	CI 95% Result Fragile Fragile CI 95% Result Robust Robust
Dvar = c_gdp Estim. Bivar Reg. EB Min EB Max EB Min EB Max Dvar = c_gdp Estim. EB Min EB Max EB Min EB Max Dvar = c_gdp Estim.	Re X = [ge Bounds - -0.0460 - -0.0084 - -0.0088 - Bounds - -0.0988 - -0.0958 - -0.0958 - -0.0976 - -0.0100 - Re X S - -0.0100 -	sult of EBA (od pode) Coeff.β -0.0219 -0.0262 -0.0301 -0.0296 -0.0296 -0.0296 -0.0296 -0.0296 -0.0314 -0.0501 -0.0562 -0.0520 -0.0578 sult of EBA (od pode) Coeff.β -0.0578	on ecsp at .65 co Z = [bltrt] Std. Erro. 0.0139 0.0099 0.0109 0.0094 0.0094 0.0094 0.0104 on drid at .70 co Z = [bltrt] Std. Erro. 0.0125 0.0229 0.0237 0.0228 0.0237 0.0228 0.0239 on oexr at .75 co Z = [bltrt] Std. Erro.	nfidence lev oltry trop tre t -2.5800 -2.6524 -2.7682 -2.7544 -2.8507 nfidence lev oltry trop tre t -2.5000 -2.1919 -2.3742 -2.2813 -2.4207 nfidence lev obtry trop tre t 2.24207	el and maxin sp drid oexr p-val 0.0200 0.1465 0.1277 0.1298 0.1154 el and maxin sp ecsp oexr p-val 0.0390 0.2725 0.2538 0.2630 0.2630 0.2494 el and maxin sp ecsp drid p-val 0.2596	num VIF = 10 fidd fiop mopy c N. comb - 66 doubles 220 triplets 220 triplets num VIF = 10 fidd fiop mopy c - 66 doubles 220 triplets num VIF = 10 fidd fiop mopy c N. comb	2020 gnsa oiim] % sign. coeff. 119.68% 137.50% 118.77% 135.21% 2020 gnsa oiim] % sign. coeff. - 159.67% 179.11% 165.73% 184.21% 2020 gnsa oiim] % sign. coeff.	CI 95% Result Fragile Fragile CI 95% Result Robust Robust CI 95% Result
Dvar = c_gdp Estim. Bivar Reg. EB Min EB Max EB Min EB Max Dvar = c_gdp Estim. Bivar Reg. EB Min EB Max EB Min EB Max Dvar = c_gdp Estim.	Re X = [ge Bounds - -0.0460 - -0.0084 - -0.0088 - Bounds - -0.0958 - -0.0958 - -0.0976 - -0.0100 - Re X S = [ge Bounds -	sult of EBA (od pode) Coeff.β -0.0219 -0.0262 -0.0301 -0.0296 -0.0296 -0.0296 -0.0296 -0.0296 -0.0314 -0.0501 -0.0501 -0.0520 -0.0520 -0.0520 -0.0578 sult of EBA (od pode) Coeff.β -4.8530 -4.8530	m ecsp at .65 co Z = [bltrt] Std. Erro. 0.0139 0.0099 0.0109 0.0094 0.0094 0.0094 0.0094 0.0014 m drid at .70 co Z = [bltrt] Std. Erro. 0.0125 0.0229 0.0237 0.0228 0.0237 0.0228 0.0239 m oexr at .75 co Z = [bltrt] Std. Erro. 1.4617 2.2400	nfidence lev oltry trop tre t -2.5800 -2.6524 -2.7682 -2.7544 -2.8507 -2.5000 -2.1919 -2.3742 -2.2813 -2.2813 -2.4207 nfidence lev obtry trop tre t -3.3200 -2.7540	el and maxin sp drid oexr p-val 0.0200 0.1465 0.1277 0.1298 0.1154 el and maxin sp ecsp oexr p-val 0.0390 0.2725 0.2538 0.2630 0.2630 0.2494 el and maxin sp ecsp drid p-val 0.2336 0.2336	num VIF = 10 fidd fiop mopy of N. comb - 66 doubles 220 triplets 220 triplets num VIF = 10 fidd fiop mopy of 86 doubles 220 triplets 220 triplets num VIF = 10 fidd fiop mopy of N. comb	2020 gnsa oiim] % sign. coeff. 119.68% 137.50% 118.77% 135.21% 2020 gnsa oiim] % sign. coeff. - 159.67% 179.11% 165.73% 184.21% 2020 gnsa oiim] % sign. coeff. - - - - - - - - - - - - -	CI 95% Result Fragile Fragile CI 95% Result Robust CI 95% Result
Dvar = c_gdp Estim. Bivar Reg. EB Min EB Max EB Min EB Max Dvar = c_gdp Estim. Bivar Reg. EB Min EB Max EB Min EB Max Bivar Reg. Estim.	Re X = [ge Bounds - -0.0460 - -0.0084 - -0.0449 - -0.0958 - -0.0958 - -0.0976 - -0.0100 - Re X -1.1375 -	sult of EBA (od pode] Coeff.β -0.0219 -0.0262 -0.0301 -0.0296 -0.0296 sult of EBA (od pode] Coeff.β -0.0501 -0.0562 -0.0520 -0.0578 sult of EBA (od pode] Coeff.β -4.8530 -6.4520	m ecsp at .65 co Z = [bltrt 1 Std. Erro. 0.0139 0.0099 0.0109 0.0094 0.0104 m drid at .70 co Z = [bltrt 1 Std. Erro. 0.0125 0.0229 0.0237 0.0228 0.0237 0.0228 0.0239 m oexr at .75 co Z = [bltrt 1 Std. Erro.	nfidence levo bltry trop trs t -2.5800 -2.6524 -2.7682 -2.7544 -2.8507 nfidence levo bltry trop trs t -2.5000 -2.1919 -2.3742 -2.2813 -2.4207 nfidence levo bltry trop trs t t -3.3200 -2.7540	el and maxin sp drid oexr p-val 0.0200 0.1465 0.1277 0.1298 0.1154 el and maxin sp ecsp oexr p-val 0.0390 0.2725 0.2538 0.2630 0.2494 el and maxin sp ecsp drid p-val 0.2536 0.2335 0.2335	num VIF = 10 fidd fiop mopy of N. comb - 66 doubles 220 triplets - fidd fiop mopy of N. comb - 66 doubles 220 triplets - fidd fiop mopy of N. comb - fidd fiop mopy of N. comb	2.uab gnsa oiim] % sign. coeff. 119.68% 137.50% 118.77% 135.21% 2.uab gnsa oiim] % sign. coeff. 	CI 95% Result Fragile Fragile CI 95% Result CI 95% Result - Robust
Dvar = c_gdp Estim. Bivar Reg. EB Min EB Max EB Min EB Max Dvar = c_gdp Estim. Bivar Reg. EB Min EB Max EB Min EB Max EB Min EB Max EB Min EB Max EB Min EB Max EB Min EB Max	Re X = [ge Bounds -0.0460 -0.0084 -0.0088 -0.0088 -0.0958 -0.0958 -0.0089 -0.0976 -0.0976 -0.0100 -0.0976 -0.0100 -0.00000 -0.0000 -0.0000 -0.0000 -0.0000 -0.0000 -0.0000 -0.0000 -0.	sult of EBA (od pode) Coeff.β -0.0219 -0.0262 -0.0301 -0.0260 -0.0296 -0.0296 -0.0296 -0.0314 -0.0501 -0.0562 -0.0520 -0.0578 -0.057	m ecsp at .65 co Z = [bltrt 1 Std. Erro. 0.0139 0.0099 0.0109 0.0094 0.0094 0.0104 m drid at .70 co Z = [bltrt 1 Std. Erro. 0.0229 0.0237 0.0228 0.0239 m oexr at .75 co Z = [bltrt 1 Std. Erro. 1.4617 2.3428 1.5857 1.0914	nfidence levo bltry trop trs t -2.5800 -2.6524 -2.7682 -2.7544 -2.8507 nfidence levo bltry trop trs t -2.5000 -2.1919 -2.3742 -2.2813 -2.4207 nfidence levo bltry trop trs t t -3.3200 -2.7540 -2.7540 -2.5246	el and maxin sp drid oexr p-val 0.0200 0.1465 0.1277 0.1298 0.1154 el and maxin sp ecsp oexr p-val 0.0390 0.2725 0.2538 0.2630 0.2494 el and maxin sp ecsp drid p-val 0.2536 0.2335 0.2320 0.2320	num VIF = 10 fidd fiop mopy of N. comb 	2000 gnsa oiim] % sign. coeff. 119.68% 137.50% 118.77% 135.21% 2000 gnsa oiim] % sign. coeff. 159.67% 179.11% 165.73% 184.21% 2000 gnsa oiim] % sign. coeff. 132.95% 82.49% 102.95%	CI 95% Result Fragile Fragile CI 95% Result CI 95% Result - Robust
Dvar = c_gdp Estim. Bivar Reg. EB Min EB Max EB Min EB Max Dvar = c_gdp Estim. Bivar Reg. EB Min EB Max EB Max EB Min EB Max Bivar Reg. EB Min EB Max EB Min EB Max EB Min EB Max EB Min	Re X = [ge Bounds - -0.0460 - -0.0084 - -0.0088 - Bounds - -0.0958 - -0.0958 - -0.0976 - -0.0100 - - -	sult of EBA (od pode) Coeff.β -0.0219 -0.0262 -0.0301 -0.0260 -0.0296 sult of EBA (od pode) Coeff.β -0.0314 -0.0501 -0.0562 -0.0520 -0.0578 sult of EBA (od pode) Coeff.β -4.8530 -6.4520 -4.0032 -5.0012 -5.0012	m ecsp at .65 co Z = [bltrt 1 Std. Erro. 0.0139 0.0099 0.0109 0.0094 0.0104 m drid at .70 co Z = [bltrt 1 Std. Erro. 0.0125 0.0229 0.0237 0.0228 0.0237 0.0228 0.0237 J. 228 0.0239 m oexr at .75 co Z = [bltrt 1 Std. Erro. 1.4617 2.3428 1.5857 1.9814 2.4737	nfidence lev oltry trop tr t -2.5800 -2.6524 -2.7682 -2.7544 -2.8507 nfidence lev oltry trop trs t -2.5000 -2.1919 -2.3742 -2.2813 -2.4207 nfidence lev oltry trop trs t -3.3200 -2.7540 -2.5246 -2.5241 2.2012	el and maxin sp drid oexr p-val 0.0200 0.1465 0.1277 0.1298 0.1154 el and maxin sp ecsp oexr p-val 0.0390 0.2725 0.2338 0.2630 0.2494 el and maxin sp ecsp drid p-val 0.2536 0.2335 0.2320 0.2443 0.215	num VIF = 10 fidd fiop mopy of N. comb 	2000 gnsa oiim] % sign. coeff. 119.68% 137.50% 118.77% 135.21% 2000 gnsa oiim] % sign. coeff. 159.67% 179.11% 165.73% 184.21% 2000 gnsa oiim] % sign. coeff. - - - - - - - - - - - - -	CI 95% Result Fragile Fragile CI 95% Result Robust CI 95% Result - Robust
Dvar = c_gdp Estim. Bivar Reg. EB Min EB Max EB Max EB Max Dvar = c_gdp Estim. Bivar Reg. EB Min EB Max EB Min EB Max	Re X = [ge Bounds - -0.0460 - -0.0084 - -0.0088 - Bounds - - - - - - - - - - 0.0958 - 0.00976 - 0.00976 - 0.00976 - 0.0100 Re Bounds - - - - - - - 0.0354	sult of EBA (od pode) Coeff.β -0.0219 -0.0262 -0.0301 -0.0260 -0.0296 sult of EBA (od pode) Coeff.β -0.0314 -0.0562 -0.0520 -0.0578 sult of EBA (od pode) Coeff.β -0.0578 -0.0578 -0.0520 -0.0578 -0.0520 -0.0578 -0.0520 -0.0578 -0.0520 -0.0578 -0.0520 -0.0578 -0.0520 -0.0578 -0.0520 -0.0578 -0.05200 -0.0520 -0.05200 -0.05200 -0.00	m ecsp at .65 co Z = [bltrt 1 Std. Erro. 0.0139 0.0099 0.0109 0.0094 0.0104 m drid at .70 co Z = [bltrt 1 Std. Erro. 0.0125 0.0229 0.0237 0.0228 0.0237 0.0228 0.0237 m oexr at .75 co Z = [bltrt 1 Std. Erro. 1.4617 2.3428 1.5857 1.9814 3.4727	nfidence lev oltry trop tr t -2.5800 -2.6524 -2.7682 -2.7544 -2.8507 nfidence lev oltry trop trs t -2.5000 -2.1919 -2.3742 -2.2813 -2.4207 nfidence lev oltry trop trs t -3.3200 -2.7540 -2.5246 -2.5241 -2.0102	el and maxin sp drid oexr p-val 0.0200 0.1465 0.1277 0.1298 0.1154 el and maxin sp ecsp oexr p-val 0.0390 0.2725 0.2538 0.2630 0.2494 el and maxin sp ecsp drid p-val 0.2536 0.2335 0.2320 0.2443 0.2215	num VIF = 10 fidd fiop mopy of N. comb 	cuab gnsa oiim] % sign. coeff. 119.68% 137.50% 137.50% 118.77% 135.21% 135.21% cuab gnsa oiim] % sign. coeff. - - 159.67% 179.11% 165.73% 184.21% uab gnsa oiim] % sign. coeff. - - 132.95% 82.49% 103.05% 143.85%	CI 95% Result Fragile Fragile CI 95% Result Robust CI 95% Result - Robust Robust
Dvar = c_gdp Estim. Bivar Reg. EB Min EB Max EB Min EB Max Dvar = c_gdp Estim. Bivar Reg. EB Min EB Max Dvar = c_gdp Estim. Bivar Reg. EB Min EB Max EB Min EB Max EB Min EB Max EB Min EB Max	Re X = [ge Bounds - -0.0460 - -0.0084 - -0.0088 - Bounds - - - - - - - - - - 0.0958 - 0.0976 - 0.00976 - 0.0100 Re Bounds - - -11.1375 - -0.8318 - -8.9640 - -0.0354 -	sult of EBA (od pode) Coeff.β -0.0219 -0.0262 -0.0301 -0.0260 -0.0296 -0.0296 -0.0296 -0.0314 -0.0501 -0.0562 -0.0520 -0.0578 -0.0520 -0.0578 -0.0520 -0.0578 -0.0520 -0.0578 -0.0520 -0.0578 -0.0520 -0.0578 -0.0520 -0.0578 -0.0520 -0.0578 -0.0520 -0.0578 -0.0520 -0.0578 -0.0520 -0.0520 -0.0578 -0.0520 -0.050	$\begin{array}{l} \textbf{m} \mbox{ ecsp at .65 co} \mbox{ Z} \ = \ [b] \mbox{ ltr t} \] \\ \hline \mbox{ Std. Erro.} \\ \hline \mbox{ 0.0099} \\ \hline \mbox{ 0.0099} \\ \hline \mbox{ 0.0094} \\ \hline \mbox{ 0.0094} \\ \hline \mbox{ 0.0104} \\ \hline \mbox{ 0.0104} \\ \hline \mbox{ m} \mbox{ drid at .70 co} \\ \hline \mbox{ Z} \ = \ [b] \mbox{ ltr t} \] \\ \hline \mbox{ Std. Erro.} \\ \hline \mbox{ 0.0125} \\ \hline \mbox{ 0.0228} \\ \hline \mbox{ 0.0237} \\ \hline \mbox{ 0.0237} \\ \hline \mbox{ 0.0228} \\ \hline \mbox{ 0.0237} \hline \mbox{ 0.0237} \\ \hline \mbox{ 0.0237} \hline \mbox{ 0.0237} \\ \hline \mbox{ 0.0237} \hline \mbox{ 0.0237} \\ \hline $	nfidence lev oltry trop tr t -2.5800 -2.6524 -2.7682 -2.7544 -2.8507 nfidence lev oltry trop trs t -2.5000 -2.1919 -2.3742 -2.2813 -2.4207 nfidence lev oltry trop trs t -3.3200 -2.7540 -2.5246 -2.5241 -2.0102	el and maxin sp drid oexr p-val 0.0200 0.1465 0.1277 0.1298 0.1154 el and maxin sp ecsp oexr p-val 0.0390 0.2725 0.2538 0.2630 0.2494 el and maxin sp ecsp drid p-val 0.2536 0.2335 0.2320 0.2443 0.2215	num VIF = 10 fidd fiop mopy of N. comb 	2000 gnsa oiim] % sign. coeff. 119.68% 137.50% 118.77% 135.21% 2000 gnsa oiim] % sign. coeff. 159.67% 179.11% 165.73% 184.21% 2000 gnsa oiim] % sign. coeff. - 132.95% 82.49% 103.05% 143.85%	CI 95% Result Fragile Fragile CI 95% Result Robust CI 95% Result - Robust Robust
Dvar = c_gdp Estim. Bivar Reg. EB Min EB Max EB Min EB Max Dvar = c_gdp Estim. Bivar Reg. EB Min EB Max Dvar = c_gdp Estim. Bivar Reg. EB Min EB Max EB Min EB Max EB Min EB Max EB Min EB Max EB Min EB Max	Re X = [ge Bounds - -0.0460 - -0.0084 - -0.0088 - Bounds - -0.00958 - -0.0958 - -0.0976 - -0.0100 - Re X Bounds - -11.1375 - -0.8318 - -8.9640 - -0.0354 -	sult of EBA (od pode) Coeff.β -0.0219 -0.0262 -0.0301 -0.0260 -0.0296 sult of EBA (od pode) Coeff.β -0.0514 -0.0501 -0.0552 -0.0520 -0.0578 sult of EBA (od pode) Coeff.β -4.8530 -6.4520 -4.0032 -5.0012 -6.9809 sult of EBA (od pode)	$\begin{array}{l} \text{ on ecsp at .65 co} \\ \mathbf{Z} &= [\mathbf{b}] \mathbf{trt l} \\ \mathbf{Std. Erro.} \\ \hline 0.0139 \\ 0.0099 \\ 0.0109 \\ 0.0094 \\ 0.0094 \\ 0.0104 \\ \hline \end{array} \\ \begin{array}{l} \text{on drid at .70 co} \\ \mathbf{Z} &= [\mathbf{b}] \mathbf{trt l} \\ \mathbf{Std. Erro.} \\ \hline 0.0125 \\ 0.0229 \\ 0.0237 \\ 0.0228 \\ 0.0237 \\ 0.0228 \\ 0.0237 \\ \hline \end{array} \\ \begin{array}{l} \text{on drid at .70 co} \\ \mathbf{Z} &= [\mathbf{b}] \mathbf{trt l} \\ \mathbf{Std. Erro.} \\ \mathbf{Z} &= [\mathbf{b}] \mathbf{trt l} \\ \mathbf{Std. Erro.} \\ 1.4617 \\ 2.3428 \\ 1.5857 \\ 1.9814 \\ 3.4727 \\ \hline \end{array} \\ \begin{array}{l} \text{on fidd at .75 coo} \\ \mathbf{Z} &= [\mathbf{b}] \mathbf{trt l} \\ \mathbf{Z} &= \mathbf{z} \\ \mathbf{Z} &=$	nfidence lev oltry trop tr t -2.5800 -2.6524 -2.7682 -2.7544 -2.8507 nfidence lev oltry trop trs t -2.5000 -2.1919 -2.3742 -2.2813 -2.4207 nfidence lev oltry trop trs t -3.3200 -2.7540 -2.5246 -2.5241 -2.0102	el and maxin sp drid oexr p-val 0.0200 0.1465 0.1277 0.1298 0.1154 el and maxin sp ecsp oexr p-val 0.0390 0.2725 0.2538 0.2630 0.2494 el and maxin sp ecsp drid p-val 0.2335 0.2335 0.2320 0.2443 0.2215	num VIF = 10 fidd fiop mopy of N. comb 	2000 gnsa oiim] % sign. coeff. 119.68% 137.50% 118.77% 135.21% 2000 gnsa oiim] % sign. coeff. 159.67% 179.11% 165.73% 184.21% 2000 gnsa oiim] % sign. coeff. - - - - - - - - - - - - -	CI 95% Result Fragile Fragile CI 95% Result - Robust CI 95% Result - Robust Robust CI 95%
Dvar = c_gdp Estim. Bivar Reg. EB Min EB Max BMin EB Max Dvar = c_gdp Estim. Bivar Reg. EB Min EB Max Bivar Reg. EB Min EB Max EB Min EB Max	Re X = [ge Bounds -0.0460 -0.0084 -0.0088 -0.0088 Re X = [ge Bounds -0.0958 -0.00976 -0.0100 -0.0976 -0.0100 Re X = [ge Bounds -11.1375 -0.8318 -8.9640 -0.0354 -0.0354 Re X = [ge Bounds	sult of EBA (od pode) Coeff.β -0.0219 -0.0262 -0.0301 -0.0260 -0.0296 -0.0296 -0.0296 -0.0314 -0.0314 -0.0314 -0.0501 -0.0552 -0.0520 -0.0578 -0.0520 -0.0578 -0.057	m ecsp at .65 co Z = [bltrt l Std. Erro. 0.0139 0.0099 0.0109 0.0094 0.0094 0.0104 m drid at .70 co Z = [bltrt l Std. Erro. 0.0125 0.0229 0.0237 0.0228 0.0237 0.025 0.055	nfidence lev oltry trop tre t -2.5800 -2.6524 -2.7682 -2.7544 -2.8507 nfidence lev oltry trop tre t -2.5000 -2.1919 -2.3742 -2.2813 -2.4207 nfidence lev oltry trop tre t -3.3200 -2.7540 -2.5246 -2.5241 -2.0102 nfidence lev oltry trop tre t	el and maxin sp drid oexr p-val 0.0200 0.1465 0.1277 0.1298 0.1154 el and maxin sp ecsp oexr p-val 0.0390 0.2725 0.2538 0.2630 0.2494 el and maxin sp ecsp drid p-val 0.2335 0.2335 0.2320 0.2443 0.2215 el and maxin sp ecsp drid p-val	num VIF = 10 fidd fiop mopy of N. comb - 66 doubles 220 triplets - 66 doubles 220 triplets - 66 doubles 220 triplets - num VIF = 10 fidd fiop mopy of N. comb - 66 doubles 220 triplets - 66 doubles 220 triplets	wab gnsa oiim] % sign. coeff. 119.68% 137.50% 118.77% 135.21% wab gnsa oiim] % sign. coeff. - 159.67% 179.11% 165.73% 184.21% - - 132.95% 82.49% 103.05% 143.85%	CI 95% Result Fragile Fragile CI 95% Result CI 95% Result CI 95% Robust Robust CI 95% Result
Dvar = c_gdp Estim. Bivar Reg. EB Min EB Max Bivar Reg. EB Max Bivar Reg. EB Min EB Max EB Min EB Max EB Min EB Max EB Min EB Max	Re X = [ge Bounds -0.04460 -0.0084 -0.0088 -0.0088 -0.0088 -0.00976 -0.0100 -0.0976 -0.0100 -0.0976 -0.0100 -0.0976 -0.0100 -0.0100 -0.0100 -0.0354	sult of EBA (od pode) Coeff.β -0.0219 -0.0262 -0.0301 -0.0260 -0.0296 -0.0296 -0.0296 -0.0296 -0.0314 -0.0314 -0.0501 -0.0562 -0.0520 -0.0520 -0.0578 -0.0520 -0.0578 -0.0520 -0.0578 -0.0520 -0.0578 -0.0520 -0.0578 -0.0520 -0.0578 -0.0520 -0.0578 -0.0520 -0.0578 -0.0520 -0.050	m ecsp at .65 co Z = [bltrt 1 Std. Erro. 0.0139 0.0099 0.0109 0.0094 0.0094 0.0104 m drid at .70 co Z = [bltrt 1 Std. Erro. 0.0125 0.0229 0.0237 0.0228 0.0237 0.0228 0.0237 0.0228 0.0239 m oexr at .75 co Z = [bltrt 1 Std. Erro. 1.4617 2.3428 1.5857 1.9814 3.4727 m fidd at .75 co Z = [bltrt h Std. Erro. 0.0185	nfidence lev oltry trop tre t -2.5800 -2.6524 -2.7682 -2.7544 -2.8507 nfidence lev oltry trop tre t -2.5000 -2.1919 -2.3742 -2.2813 -2.4207 nfidence lev oltry trop tre t -3.3200 -2.7540 -2.5246 -2.5241 -2.0102 nfidence lev oltry trop tre t -2.3200	el and maxin sp drid oexr p-val 0.0200 0.1465 0.1277 0.1277 0.1298 0.1154 el and maxin sp ecsp oexr p-val 0.0390 0.2725 0.2538 0.2630 0.2494 el and maxin sp ecsp drid p-val 0.2536 0.2320 0.2443 0.2215 el and maxin sp ecsp drid p-val 0.2536 0.2320 0.2443 0.2215	num VIF = 10 fidd fiop mopy of N. comb 	uab gnsa oiim] % sign. coeff. 119.68% 137.50% 118.77% 135.21% uab gnsa oiim] % sign. coeff. - - 159.67% 179.11% 165.73% 184.21% uab gnsa oiim] % sign. coeff. - - 132.95% 82.49% 103.05% 143.85% cuab gnsa oiim] % sign. coeff.	CI 95% Result Fragile Fragile CI 95% Result CI 95% Result CI 95% Robust Robust CI 95% Result
Dvar = c_gdp Estim. Bivar Reg. EB Min EB Max EB Min EB Max Dvar = c_gdp Estim. Bivar Reg. EB Min EB Max EB Min EB Max	Re X = [ge Bounds -0.0460 -0.0084 -0.0088 -0.0088 -0.0088 -0.0088 -0.0089 -0.0976 -0.0100 -0.0100 -0.0100 -0.0100 -0.0100 -0.0111 -0.0354 -0.0354 -0.0354 -0.0354 -0.0354 -0.0809	sult of EBA (od pode) Coeff.β -0.0219 -0.0262 -0.0301 -0.0260 -0.0296 -0.0296 -0.0296 -0.0296 -0.0314 -0.0314 -0.0501 -0.0562 -0.0520 -0.0578 -0.0578 -0.0578 -0.0578 -0.0578 -0.0578 -0.0578 -0.0520 -0.0578 -0.0578 -0.0578 -0.0578 -0.0578 -0.0453 -0.0412 -0.0453	m ecsp at .65 co Z = [bltrt l Std. Erro. 0.0139 0.0099 0.0109 0.0094 0.0094 0.0104 m drid at .70 co Z = [bltrt l Std. Erro. 0.0125 0.0229 0.0237 0.0228 0.0228 0.0239 m oexr at .75 co Z = [bltrt l Std. Erro. 1.4617 2.3428 1.5857 1.9814 3.4727 m fidd at .75 co Z = [bltrt l Std. Erro. 0.0185 0.0178	nfidence lev oltry trop tre t -2.5800 -2.6524 -2.7682 -2.7544 -2.7544 -2.8507 	el and maxin sp drid oexr p-val 0.0200 0.1465 0.1277 0.1298 0.1154 el and maxin sp ecsp oexr p-val 0.0390 0.2725 0.2538 0.2630 0.2494 el and maxin sp ecsp drid p-val 0.2335 0.2235 0.2235 0.2235 0.2235 0.2235 0.2235 0.2235 0.2235 0.2235 0.2235 0.2235 0.22443 0.2215	num VIF = 10 fidd fiop mopy of N. comb - 66 doubles 220 triplets - 10 fidd fiop mopy of N. comb - 66 doubles 220 triplets - 10 fidd fiop mopy of N. comb - 66 doubles 220 triplets - 220 triplets - 66 doubles 220 triplets - 66 doubles 220 triplets - 66 doubles 220 triplets - 66 doubles - 66 doubles - - 66 doubles - - 66 doubles - - 66 doubles - - 66 doubles - - - 66 doubles - - - 66 doubles - - - 66 doubles - - - - - - - - - - - - -	2020 gnsa oiim] % sign. coeff. 119.68% 137.50% 118.77% 135.21% 2020 gnsa oiim] % sign. coeff. - 159.67% 179.11% 165.73% 184.21% 2020 gnsa oiim] % sign. coeff. - 132.95% 82.49% 103.05% 143.85% - - - 109.87%	CI 95% Result Fragile Fragile CI 95% Result Robust CI 95% Result Robust Robust CI 95% Result
Dvar = c_gdp Estim. Bivar Reg. EB Min EB Max EB Min EB Max Dvar = c_gdp Estim. Bivar Reg. EB Min EB Max EB Min EB Max EB Min EB Max EB Min EB Max EB Min EB Max EB Min EB Max EB Min EB Max	Re X = [ge Bounds -0.0460 -0.0084 -0.0088 -0.0088 -0.0978 -0.0978 -0.0976 -0.0976 -0.0976 -0.0100 Re X = [ge Bounds -11.1375 -0.8318 -8.9640 -0.0354 -0.0354 -0.0354 -0.0354 -0.0809 -0.0223	sult of EBA (od pode) Coeff.β -0.0219 -0.0262 -0.0301 -0.0260 -0.0296 -0.0296 -0.0296 -0.0296 -0.0314 -0.0501 -0.0562 -0.0578 -0.0583 -0.0583	m ecsp at .65 co Z = [bltrt 1 Std. Erro. 0.0139 0.0099 0.0109 0.0094 0.0104 m drid at .70 co Z = [bltrt 1 Std. Erro. 0.0229 0.0237 0.0229 0.0237 0.0228 0.0239 m oexr at .75 co Z = [bltrt 1 Std. Erro. 1.4617 2.3428 1.5857 1.9814 3.4727 m fidd at .75 co Z = [bltrt b Std. Erro. 0.0185 m fidd at .75 co Z = [bltrt b	nfidence levo bltry trop trs t -2.5800 -2.6524 -2.7682 -2.7544 -2.8507 nfidence levo bltry trop trs t -2.540 -2.1919 -2.3742 -2.2813 -2.4207 nfidence levo bltry trop trs t -3.3200 -2.7540 -2.5246 -2.5241 -2.5241 -2.5241 -2.5241 -2.5244 -2.5244 -2.5244 -2.5244 -2.5243 -2.2300 -2.5434 -3.2426	el and maxin sp drid oexr p-val 0.0200 0.1465 0.1277 0.1298 0.1154 el and maxin sp ecsp oexr p-val 0.0390 0.2725 0.2538 0.2630 0.2494 0.2335 0.2320 0.2443 0.2325 0.2215 el and maxin sp ecsp drid p-val 0.2356 0.2325 0.2443 0.2215 el and maxin sp ecsp drid p-val 0.2385 0.2385 0.2385 0.1904	num VIF = 10 fidd fiop mopy of N. comb 	2.uab gnsa oiim] % sign. coeff. 119.68% 137.50% 118.77% 135.21% 2.uab gnsa oiim] % sign. coeff. - 159.67% 179.11% 165.73% 184.21% 2.uab gnsa oiim] % sign. coeff. - 132.95% 82.49% 103.05% 143.85% 2.uab gnsa oiim] % sign. coeff. - - - - - - - - - - - - -	CI 95% Result Fragile Fragile CI 95% Result - Robust Robust CI 95% Result - Robust CI 95% Result - Robust
Dvar = c_gdp Estim. Bivar Reg. EB Min EB Max EB Min	Re X = [ge Bounds -0.0449 -0.0088 Re X = [ge Bounds -0.0958 -0.0958 -0.0958 -0.0976 -0.0976 -0.0100 Re X = [ge Bounds -11.1375 -0.8318 -8.9640 -0.0354 Re X = [ge Bounds -11.1375 -0.8318 -8.9640 -0.0354 Re -1.00354 -1.003554 -	sult of EBA (od pode] Coeff.β -0.0219 -0.0262 -0.0301 -0.0296 -0.0296 sult of EBA (od pode] Coeff.β -0.0314 -0.0501 -0.0562 -0.0520 -0.0578 -0.0520 -0.0578 -0.0520 -0.0578 -0.0520 -0.0578 -0.0520 -0.0578 -0.0520 -0.0578 -0.0520 -0.0578 -0.0520 -0.0578 -0.0520 -0.0578 -0.0520 -0.0578 -0.0520 -0.0520 -0.0578 -0.012 -0.9809 -0.0412 -0.0412 -0.0453 -0.0446	m ecsp at .65 co Z = [bltrt 1 Std. Erro. 0.0139 0.0099 0.0109 0.0094 0.0094 0.0104 m drid at .70 co Z = [bltrt 1 Std. Erro. 0.0125 0.0229 0.0237 0.0228 0.0229 0.0237 0.0228 0.0229 0.0237 0.0228 0.0239 m oexr at .75 co Z = [bltrt l Std. Erro. 0.0185 0.0178 0.0180 0.0180 0.0180 0.0180	nfidence levo bltry trop trs t -2.5800 -2.6524 -2.7682 -2.7544 -2.8507 nfidence levo bltry trop trs t -2.5000 -2.1919 -2.3742 -2.2813 -2.4207 nfidence levo bltry trop trs t -3.3200 -2.5246 -2.5241 -2.0102 nfidence levo bltry trop trs t -2.300 -2.5434 -3.2426 -2.5434 -3.2426 -2.5470	el and maxin sp drid oexr p-val 0.0200 0.1465 0.1277 0.1298 0.1154 el and maxin sp ecsp oexr p-val 0.0390 0.2725 0.2538 0.2630 0.2494 el and maxin sp ecsp drid p-val 0.2536 0.2335 0.2320 0.2443 0.2215 el and maxin sp ecsp drid p-val 0.2536 0.2325 0.2320 0.2443 0.2215 el and maxin sp ecsp drid p-val 0.0300 0.2215 el and maxin sp ecsp drid p-val	num VIF = 10 fidd fiop mopy of N. comb 	2000 gnsa oiim] % sign. coeff. 119.68% 137.50% 118.77% 135.21% 2000 gnsa oiim] % sign. coeff. - - - - - - - - - - - - -	CI 95% Result Fragile Fragile CI 95% Result - Robust CI 95% Result - Robust Robust CI 95% Result - Robust Robust
Dvar = c_gdp Estim. Bivar Reg. EB Min EB Max EB Min EB Max	Re X = [ge Bounds -0.0460 -0.0084 -0.0449 -0.0088 Re X = [ge Bounds -0.0958 -0.0958 -0.0958 -0.0958 -0.0976 -0.0100 Re X = [ge Bounds -11.1375 -0.8318 -8.9640 -0.0354 Re X = [ge Bounds -11.0375 -0.8318 -8.9640 -0.0354 Re -0.0354 -0.0354 -0.009 -0.0223 -0.0796 -0.0190	sult of EBA (od pode) Coeff.β -0.0219 -0.0262 -0.0301 -0.0296 sult of EBA (od pode) Coeff.β -0.0314 -0.0501 -0.0562 -0.0520 -0.0578 sult of EBA (od pode) Coeff.β -4.8530 -6.4520 -4.0032 -5.0012 -6.9809 sult of EBA (od pode) Coeff.β -0.0412 -0.0453 -0.0446 -0.0584	$\begin{array}{l} \textbf{m} \mbox{ ecsp at .65 co} \mbox{ Z} \ = \ [bltrt 1] \\ \hline \mbox{Std. Erro.} \\ 0.0139 \\ 0.0099 \\ 0.0109 \\ 0.0094 \\ 0.0094 \\ 0.0104 \\ \hline \mbox{m} \ \mbox{drid} \ \mbox{at .70 co} \\ \mbox{Z} \ = \ \mbox{[bltrt 1]} \\ \hline \mbox{Std. Erro.} \\ \hline \mbox{0.0229} \\ 0.0229 \\ 0.0237 \\ 0.0228 \\ 0.0229 \\ \hline \mbox{0.0228} \\ 0.0229 \\ \hline \mbox{0.0228} \\ 0.0237 \\ \hline \mbox{0.0228} \\ 0.0237 \\ \hline \mbox{0.0228} \\ \hline \mbox{0.0229} \\ \hline \mbox{0.0228} \\ \hline \mbox{0.0229} \\ \hline \mbox{0.0228} \\ \hline 0.0228$	nfidence levo bltry trop trs t -2.5800 -2.6524 -2.7682 -2.7544 -2.8507 nfidence levo bltry trop trs t -2.5000 -2.1919 -2.3742 -2.2813 -2.4207 nfidence levo bltry trop trs t -3.3200 -2.7540 -2.5246 -2.5241 -2.0102 nfidence levo bltry trop trs t -2.200 -2.5434 -3.2200 -2.5434 -3.2426 -2.5470 -2.9671	el and maxin sp drid oexr p-val 0.0200 0.1465 0.1277 0.1298 0.1154 el and maxin sp ecsp oexr p-val 0.0390 0.2725 0.2538 0.2630 0.2494 el and maxin sp ecsp drid p-val 0.2536 0.2335 0.2320 0.2443 0.2215 el and maxin sp ecsp drid p-val 0.2385 0.2385 0.2385 0.2385 0.2385 0.1904 0.2382 0.2069	num VIF = 10 fidd fiop mopy of N. comb 	2. uab gnsa oiim] % sign. coeff. 119.68% 137.50% 118.77% 135.21% 2. uab gnsa oiim] % sign. coeff. - - - - - - - - - - - - -	CI 95% Result Fragile Fragile CI 95% Result - Robust CI 95% Result - Robust Robust CI 95% Result - Robust Robust

Tables 4: Extreme Bound Analysis Results for the Euro Area from 1980 to 1989

	R	esult of EBA	on fion at .75 co	onfidence lev	el and maxir	num VIF = 10		
Dvar = c gdp	X = [ge	od pode]	Z = [bltrt]	bltry trop tr	sp ecsp drid	oexr fidd mopy o	uab gnsa oiim]	CI 95%
Estim.	Bounds	Coeff.ß	Std. Erro.	ť	p-val	N. comb	% sign. coeff.	Result
Bivar Reg.	-	1.8560	1.6425	1.1300	0.0123	-	-	-
EB Min	-1.0479	1.1023	1.0751	1.0253	0.0535	66.1.11	59.39%	т · і
EB Max	4.0770	2.0320	1.0225	1.9873	0.0123	66 doubles	109.48%	Fragile
EB Min	-2.6518	3.2562	2,9540	1.1023	0.0235		175.44%	
EB Max	5.8983	2.8536	1.5223	1.8745	0.0412	220 triplets	153.75%	Fragile
	Re	sult of EBA o	n mopy at .75 c	onfidence le	vel and maxi	mum VIF = 10		
Dvar = c_gdp	X = [ge	od pode]	$\mathbf{Z} = [\mathbf{b}]\mathbf{t}\mathbf{r}\mathbf{t}$	bltry trop t	rsp ecsp drid	oexr fidd fiop ci	iab gusa ojim]	CI 95%
Estim.	Bounds	Coeff.B	Std. Erro.	t	p-val	N. comb	% sign. coeff.	Result
Bivar Reg.	-	0.2532	0.1192	2,1250	0.1222	-	-	-
EB Min	0.0774	0.2156	0.0691	3 1203	0.6985		85 15%	
EB Max	0.5350	0 3269	0 1040	3 1420	0.2251	66 doubles	129 11%	Robust
EB Min	0.1102	0.2140	0.0519	4 1253	0.1253		84 52%	
EB Max	0.3764	0.2512	0.0626	4 0120	0.2025	220 triplets	99.21%	Robust
LD Mux	0.5701	0.2312	0.0020	1.0120	0.2025		<i>))</i> .2170	
	Re	sult of FRA	on cush at 75 co	onfidence les	el and mavi	mum VIF – 10		
Dvar – c. adn	X – [ge	od podel	7 - [b]trt	bltry trop tr	er and maxi	oevr fidd fion m	ony anso ojim]	CT 05%
Ectim	Bounds	Coeff B	Std Erro	t bit y ti op ti	n_vol	N comb	% sign coeff	Recult
Dima Dec	Doulius	0.7274	0.2601	2 7400	p-vai	N. Comb	70 sign. coen.	Result
ED Min	0 1654	0.7374	0.2091	2.7400	0.0080	-	- 86 760/	-
ED MIII	1.2559	0.0301	0.2334	2.7020	0.2230	66 doubles	102 460	Robust
ED Max	1.2558	0.7629	0.2404	3.0938	0.1989		105.40%	
EB Min	0.1640	0.6278	0.2319	2.7070	0.2255	220 triplets	85.14%	Robust
EB Max	1.2617	0.7636	0.2490	3.0663	0.2007	*	103.55%	
	Re	sult of EBA	on gnsa at .75 co	onfidence lev	el and maxin	mum VIF = 10		
$Dvar = c_gdp$	$X = \lfloor ge$	eod pode	Z = [bltrt]	bltry trop tr	sp ecsp drid	oexr fidd fiop m	opy cuab oiim]	CI 95%
Estim.	Bounds	Coeff.ß	Std. Erro.	t	p-val	N. comb	% sign. coeff.	Result
Bivar Reg.	-	1.0012	0.3015	3.3210	0.0450	-	-	-
EB Min	0.8724	1.4520	0.2898	5.0102	0.3325	66 doubles	145.03%	Robust
EB Max	2.2582	1.6202	0.3190	5.0786	0.5210	00 4040105	161.83%	reoouse
EB Min	0.9846	1.6520	0.3337	4.9502	0.2553	220 triplets	165.00%	Robust
EB Max	2.4558	1.6897	0.3831	4.4111	0.3625	220 dispicto	168.77%	rtooust
	Re	esult of EBA	on oiim at .75 co	onfidence lev	el and maxii	num VIF = 10		~
$Dvar = c_gdp$	X = [ge	od pode]	$\mathbf{Z} = [\mathbf{b}]\mathbf{t}\mathbf{r}\mathbf{t}$	bltry trop tr	sp ecsp drid	oexr fidd fiop m	opy cuab gnsa]	CI 95%
Estim.	Bounds	Coeff.B	Std. Erro.	t	p-val	N. comb	% sign. coeff.	Result
Bivar Reg.	-	0.7890	0.3921	2.0123	0.0444	-	-	-
EB Min	0.0071	0.1203	0.0566	2.1250	0.2252	66 doubles	15.25%	Fragile
EB Max	2.8048	1.3555	0.7247	1.8705	0.2444	00 000000	171.80%	Trugino
EB Min	0.4373	1.4556	0.5091	2.8590	0.3325	220 triplets	184.49%	Fragile
FR Mov	0 50 1 5	1.4789	0.6564	2 2530	0.1125	220 unpiets	187.44%	Tragine
ED Max	2.7917			212000	0.1125			
	2.7917			2.2000	0.1125			
ер шах	2.7917 Re	sult of EBA	on geod at .75 co	onfidence lev	vel and maxim	mum VIF = 10		
Dvar = c_gdp	2.7917 Re X =	esult of EBA [pode]	on geod at .75 cc Z = [bltrt blt	onfidence lev ry trop trsp	el and maxin	mum VIF = 10 &r fidd fiop mopy	cuab gnsa oiim]	CI 95%
Dvar = c_gdp Estim.	2.7917 Re X = Bounds	esult of EBA [pode] Coeff.β	on geod at .75 cc Z = [bltrt bltr Std. Erro.	onfidence lev ry trop trsp t	vel and maxim ecsp drid oex p-val	mum VIF = 10 xr fidd fiop mopy N. comb	cuab gnsa oiim] % sign. coeff.	CI 95% Result
Dvar = c_gdp Estim. Bivar Reg.	2.7917 Re X = Bounds	esult of EBA [pode] Coeff.β -0.9860	on geod at .75 cc Z = [bltrt bltr Std. Erro. 0.4640	onfidence lev ry trop trsp t -2.1250	rel and maxin ecsp drid oex p-val 0.0111	mum VIF = 10 kr fidd fiop mopy N. comb	cuab gnsa oiim] % sign. coeff.	CI 95% Result
Dvar = c_gdp Estim. Bivar Reg. EB Min	2.7917 Re X = Bounds - -1.2055	esult of EBA [pode] Coeff.β -0.9860 -0.7890	on geod at .75 cc Z = [bltrt bltr Std. Erro. 0.4640 0.2082	onfidence lev ry trop trsp t -2.1250 -3.7890	rel and maxin ecsp drid oex p-val 0.0111 0.2253	mum VIF = 10 sr fidd fiop mopy N. comb -	r cuab gnsa oiim] % sign. coeff. - 80.02%	CI 95% Result - Robust
Dvar = c_gdp Estim. Bivar Reg. EB Min EB Max	2.7917 Re X = Bounds -1.2055 -0.3097	esult of EBA [pode] Coeff.β -0.9860 -0.7890 -0.8522	on geod at .75 cc Z = [bltrt bltr Std. Erro. 0.4640 0.2082 0.2712	2.12000 ponfidence lev ry trop trsp (-2.1250 -3.7890 -3.1420	rel and maxim ecsp drid oex p-val 0.0111 0.2253 0.2222	mum VIF = 10 cr fidd fiop mopy <u>N. comb</u> - 66 doubles	' cuab gnsa oiim] % sign. coeff. - 80.02% 86.43%	CI 95% Result - Robust
Dvar = c_gdp Estim. Bivar Reg. EB Min EB Max EB Min	2.7917 Re Bounds -1.2055 -0.3097 -1.1099	sult of EBA [pode] Coeff.β -0.9860 -0.7890 -0.8522 -0.5698	bn geod at .75 cc Z = [bltrt bltn Std. Erro. 0.4640 0.2082 0.2712 0.2700	2.12000 ponfidence lev ry trop trsp of -2.1250 -3.7890 -3.1420 -2.1101	rel and maxim ecsp drid oex p-val 0.0111 0.2253 0.2222 0.1985	mum VIF = 10 r fidd fiop mopy N. comb - 66 doubles 220 triplets	cuab gnsa oiim] % sign. coeff. 80.02% 86.43% 57.79%	CI 95% Result Robust
Dvar = c_gdp Estim. Bivar Reg. EB Min EB Max EB Min EB Max	2.7917 Re Bounds -1.2055 -0.3097 -1.1099 -0.0288	sult of EBA [pode] Coeff.β -0.9860 -0.7890 -0.8522 -0.5698 -0.5477	D n geod at .75 cc Z = [bltrt bltn Std. Erro. 0.4640 0.2082 0.2712 0.2700 0.2595	2.12000 pnfidence lew ry trop trsp (-2.1250 -3.7890 -3.1420 -2.1101 -2.1110	rel and maxin ecsp drid oex p-val 0.0111 0.2253 0.2222 0.1985 0.2054	mum VIF = 10 cr fidd fiop mopy N. comb - 66 doubles 220 triplets	cuab gnsa oiim] % sign. coeff. 80.02% 86.43% 57.79% 55.55%	CI 95% Result - Robust Robust
Dvar = c_gdp Estim. Bivar Reg. EB Min EB Max EB Min EB Max	2.7917 Re X = Bounds -1.2055 -0.3097 -1.1099 -0.0288	esult of EBA [pode] Coeff.β -0.9860 -0.7890 -0.8522 -0.5698 -0.5477	bn geod at .75 cc Z = [bltrt bltn Std. Erro. 0.4640 0.2082 0.2712 0.2700 0.2595	t -2.1250 -3.7890 -3.1420 -2.1101 -2.1110	o.1123 rel and maxin ecsp drid oes p-val 0.0111 0.2253 0.2222 0.1985 0.2054	mum VIF = 10 cr fidd fiop mopy N. comb - 66 doubles 220 triplets	r cuab gnsa oiim] % sign. coeff. - 80.02% 86.43% 57.79% 55.55%	CI 95% Result Robust Robust
Dvar = c_gdp Estim. Bivar Reg. EB Min EB Max EB Min EB Max	2.7917 Re X = Bounds -1.2055 -0.3097 -1.1099 -0.0288 Re	sult of EBA [pode] <u>Coeff.β</u> -0.9860 -0.7890 -0.8522 -0.5698 -0.5477 sult of EBA of	on geod at .75 cc Z = [bltrt bltn Std. Erro. 0.4640 0.2082 0.2712 0.2700 0.2595	2.12000 pnfidence lev ry trop trsp -2.1250 -3.7890 -3.1420 -2.1101 -2.1110 pnfidence lev	el and maxin ecsp drid oes p-val 0.0111 0.2253 0.2222 0.1985 0.2054 el and maxin	mum VIF = 10 cr fidd fiop mopy N. comb - 66 doubles 220 triplets mum VIF = 10	v cuab gnsa oiim] % sign. coeff. - 80.02% 86.43% 57.79% 55.55%	CI 95% Result - Robust Robust
Dvar = c_gdp Estim. Bivar Reg. EB Min EB Max EB Min EB Max Dvar = c_gdp	2.7917 Re X = Bounds -1.2055 -0.3097 -1.1099 -0.0288 Re	sult of EBA [pode] Coeff.β -0.9860 -0.7890 -0.8522 -0.5698 -0.5698 -0.5477 sult of EBA Δ = [geod]	on geod at .75 cc Z = [bltrt bltn Std. Erro. 0.4640 0.2082 0.2712 0.2700 0.2595 on pode at .70 cc Z = [bltrt blt]	2.12000 ponfidence lev ry trop trsp (-2.1250 -3.7890 -3.1420 -2.1101 -2.1110 ponfidence lev ry trop trsp (trsp (-2.1250) -3.7890 -3.1420 -2.1101 -2	el and maxim ecsp drid oes p-val 0.0111 0.2253 0.2222 0.1985 0.2054 el and maxim ecsp drid oes	mum VIF = 10 xr fidd fiop mopy N. comb - 66 doubles 220 triplets mum VIF = 10 xr fidd fiop mopy	7 cuab gnsa oiim] % sign. coeff. 80.02% 86.43% 57.79% 55.55%	CI 95% Result Robust Robust
Dvar = c_gdp Estim. Bivar Reg. EB Min EB Max EB Min EB Max Dvar = c_gdp Estim.	2.7917 Re X = Bounds -1.2055 -0.3097 -1.1099 -0.0288 Re X Bounds	sult of EBA [pode] -0.9860 -0.7890 -0.8522 -0.5698 -0.5698 -0.5477 	on geod at .75 cc Z = [bltrt bltn Std. Erro. 0.4640 0.2082 0.2712 0.2700 0.2595 00 pode at .70 cc Z = [bltrt bltn Std. Erro.	2.12000 ponfidence lev ry trop trsp (-2.1250 -3.7890 -3.1420 -2.1101 -2.1110 ponfidence lev ry trop trsp (t	el and maxim ecsp drid oes p-val 0.0111 0.2253 0.2222 0.1985 0.2054 el and maxim ecsp drid oes p-val	mum VIF = 10 cr fidd fiop mopy N. comb - 66 doubles 220 triplets 220 triplets mum VIF = 10 cr fidd fiop mopy N. comb	7 cuab gnsa oiim] % sign. coeff. 80.02% 86.43% 57.79% 55.55% 7 cuab gnsa oiim] % sign. coeff.	CI 95% Result - Robust Robust CI 95% Result
Dvar = c_gdp Estim. Bivar Reg. EB Min EB Max EB Min EB Max Dvar = c_gdp Estim. Bivar Reg.	2.7917 Re Bounds -1.2055 -0.3097 -1.1099 -0.0288 Re Bounds	sult of EBA Coeff.β -0.9860 -0.7890 -0.8522 -0.5698 -0.5477 sult of EBA ζ Coeff.β O.4351	pn geod at .75 cc Z = [bltrt bltn Std. Erro. 0.4640 0.2082 0.2712 0.2700 0.2595 pn pode at .70 cc $Z = [bltrt bltn Std. Erro. 0.2171$	2.12000 porfidence lev ry trop trsp t -2.1250 -3.7890 -3.1420 -2.1101 -2.1110 porfidence lev ry trop trsp t 2.0000	el and maxim ecsp drid oes p-val 0.0111 0.2253 0.2222 0.1985 0.2054 el and maxim ecsp drid oes p-val 0.0500	mum VIF = 10 cr fidd fiop mopy N. comb - 66 doubles 220 triplets mum VIF = 10 cr fidd fiop mopy N. comb	<pre>v cuab gnsa oiim] % sign. coeff. 80.02% 86.43% 57.79% 55.55% v cuab gnsa oiim] % sign. coeff. -</pre>	CI 95% Result Robust Robust CI 95% Result
Dvar = c_gdp Estim. Bivar Reg. EB Min EB Max EB Min EB Max Dvar = c_gdp Estim. Bivar Reg. EB Min	2.7917 Re Bounds -1.2055 -0.3097 -1.1099 -0.0288 Re Bounds -	sult of EBA [pode] Coeff.β -0.9860 -0.7890 -0.8522 -0.5698 -0.5477 sult of EBA (Coeff.β 0.4351 0.5361	Din geod at .75 cc Z = [bltrt bltr Std. Erro. 0.4640 0.2082 0.2712 0.2700 0.2595 Din pode at .70 cc Z = [bltrt blt: Std. Erro. 0.2171 0.2650	2.12000 pofidence lev ry trop trsp -2.1250 -3.7890 -3.1420 -2.1101 -2.1110 pofidence lev ry trop trsp t 2.0000 2.0231	el and maxii ecsp drid oex p-val 0.0111 0.2253 0.2222 0.1985 0.2054 el and maxii ecsp drid oex p-val 0.0500 0.2923	mum VIF = 10 cr fidd fiop mopy N. comb 66 doubles 220 triplets mum VIF = 10 cr fidd fiop mopy N. comb	<pre>cuab gnsa oiim] % sign. coeff. 80.02% 86.43% 57.79% 55.55% / cuab gnsa oiim] % sign. coeff. - 123.21%</pre>	CI 95% Result Robust CI 95% Result
Dvar = c_gdp Estim. Bivar Reg. EB Min EB Max EB Min EB Max Dvar = c_gdp Estim. Bivar Reg. EB Min EB Max	2.7917 Re X = Bounds -1.2055 -0.3097 -1.1099 -0.0288 Re X Bounds - 0.0061 0.9281	sult of EBA [pode] Coeff.β -0.9860 -0.7890 -0.8522 -0.5698 -0.5477 sult of EBA ζ -[geod] Coeff.β 0.4351 0.5361 0.4351 0.5361 0.43849	Din geod at .75 cc Z = [bltrt bltn Std. Erro. 0.4640 0.2082 0.2712 0.2700 0.2595 Din pode at .70 cc Z = [bltrt bltn Std. Erro. 0.2171 0.2650 0.2216	2.12000 ponfidence lev ry trop trsp t -2.1250 -3.7890 -3.1420 -2.1110 -2.1110 ponfidence lev ry trop trsp t 2.0000 2.0231 2.1883	eil and maxii ecsp drid oes p-val 0.0111 0.2223 0.1985 0.2054 el and maxin ecsp drid oes p-val 0.0500 0.2923 0.2729	mum VIF = 10 cr fidd fiop mopy N. comb - 66 doubles 220 triplets 220 triplets mum VIF = 10 cr fidd fiop mopy N. comb - 66 doubles	v cuab gnsa oiim] % sign. coeff. 80.02% 86.43% 57.79% 55.55% v cuab gnsa oiim] % sign. coeff. 123.21% 111.44%	CI 95% Result Robust Robust CI 95% Result - Robust
Dvar = c_gdp Estim. Bivar Reg. EB Min EB Max EB Max Dvar = c_gdp Estim. Bivar Reg. EB Min EB Max EB Min	2.7917 Re X = Bounds -1.2055 -0.3097 -1.1099 -0.0288 - - Bounds - 0.0061 0.9281 0.0038	sult of EBA [pode] Coeff.β -0.9860 -0.7890 -0.8522 -0.5698 -0.5477 sult of EBA ζ = [geod] Coeff.β 0.4351 0.5361 0.4849 0.5061	Din geod at .75 cc Z = [bltrt bltn Std. Erro. 0.4640 0.2082 0.2712 0.2700 0.2595 Din pode at .70 cc Z = [bltrt bltn Std. Erro. 0.2171 0.2650 0.2216 0.2511	2.12000 pnfidence lev ry trop trsp t -2.1250 -3.7890 -3.1420 -2.1101 -2.1110 pnfidence lev ry trop trsp t 2.0000 2.0231 2.1883 2.0152	el and maxin ecsp drid oes p-val 0.0111 0.2253 0.2222 0.1985 0.2054 ecsp drid oes p-val 0.0500 0.2923 0.2729 0.2932	mum VIF = 10 cr fidd fiop mopy N. comb - 66 doubles 220 triplets - mum VIF = 10 cr fidd fiop mopy N. comb - 66 doubles	v cuab gnsa oiim] % sign. coeff. 80.02% 86.43% 57.79% 55.55% 7 cuab gnsa oiim] % sign. coeff. - 123.21% 111.44% 116.32%	CI 95% Result Robust Robust CI 95% Result Robust
Dvar = c_gdp Estim. Bivar Reg. EB Min EB Max EB Min EB Max Dvar = c_gdp Estim. Bivar Reg. EB Min EB Max EB Max	2.7917 Re X = Bounds -1.2055 -0.3097 -1.1099 -0.0288 Re X Bounds - 0.0061 0.9281 0.0038 0.9169	sult of EBA [pode] Coeff.β -0.9860 -0.7890 -0.8522 -0.5698 -0.5477 sult of EBA ζ [geod] Coeff.β 0.4351 0.5361 0.4849 0.5061 0.4707	Din geod at .75 cc Z = [bltrt bltn Std. Erro. 0.4640 0.2082 0.2712 0.2700 0.2595 Din pode at .70 cc Z = [bltrt bltn Std. Erro. 0.2171 0.2650 0.2216 0.2231	2.2000 pnfidence lev ry trop trsp -2.1250 -3.7890 -3.1420 -2.1101 -2.1110 pnfidence lev ry trop trsp t 2.0000 2.0231 2.1883 2.0152 2.1096	el and maxin ecsp drid oes p-val 0.0111 0.2253 0.2222 0.1985 0.2054 el and maxin ecsp drid oes p-val 0.0500 0.2923 0.2729 0.2932 0.2818	mum VIF = 10 cr fidd fiop mopy N. comb - 66 doubles 220 triplets mum VIF = 10 cr fidd fiop mopy N. comb - 66 doubles 220 triplets	v cuab gnsa oiim] % sign. coeff. 80.02% 86.43% 57.79% 55.55% v cuab gnsa oiim] % sign. coeff. - 123.21% 111.44% 116.32% 108.18%	CI 95% Result - Robust Robust CI 95% Result - Robust Robust

Tables 4: Continued

	Re	sult of EBA o	on bltrt at .75 co	nfidence lev	el and maxir	num VIF = 10		
Dvar = c_gdp	X = [ge	od pode]	Z = [bltry	trop trsp ec	sp drid oexr	fidd fiop mopy c	uab gnsa oiim]	CI 95%
Estim.	Bounds	Coeff.ß	Std. Erro.	t	p-val	N. comb	% sign. coeff.	Result
Bivar Reg.	-	5.7877	1.4695	3.9400	0.0000	-	-	-
EB Min	1.5708	3.7650	1.0971	3.4317	0.1805	66 doublos	65.05%	Dobust
EB Max	8.1659	5.9428	1.1115	5.3465	0.1177	oo doubles	102.68%	KODUSI
EB Min	1.5518	3.7726	1.1104	3.3975	0.1822	220 triplats	65.18%	Pobust
EB Max	8.1740	5.9288	1.1226	5.2814	0.1191	220 triplets	102.44%	Kobusi
	Re	sult of EBA o	on bltry at .75 co	onfidence lev	el and maxin	num VIF = 10		
Dvar = c_gdp	X = [ge	od pode]	Z = [bltrt	trop trsp ec:	sp drid oexr	fidd fiop mopy c	uab gnsa oiim]	CI 95%
Estim.	Bounds	Coeff.ß	Std. Erro.	t	p-val	N. comb	% sign. coeff.	Result
Bivar Reg.	-	2.6788	0.7434	3.6000	0.0010	-	-	-
EB Min	0.4134	1.6209	0.6037	2.6848	0.2270	66 1 11	60.51%	D 1
EB Max	3.7373	2.5307	0.6033	4.1949	0.1490	66 doubles	94.47%	Robust
EB Min	0.3387	1.5263	0.5938	2.5704	0.2362		56.98%	
EB Max	3.7213	2.4908	0.6153	4.0484	0.1542	220 triplets	92.98%	Robust
	Re	sult of EBA o	on trop at .75 co	onfidence leve	el and maxir	num VIF = 10		
Dvar = c_gdp	X = [ge	od pode]	Z = [bltrt	bltry trsp ec	sp drid oexr	fidd fiop mopy o	cuab gnsa oiim]	CI 95%
Estim.	Bounds	Coeff.ß	Std. Erro.	t	p-val	N. comb	% sign. coeff.	Result
Bivar Reg.	-	1.3534	0.3698	3.6600	0.0010	-	-	-
EB Min	0.1610	0.7969	0.3179	2.5065	0.2417	((daubles	58.88%	Dahaat

Tables 5: Extreme Bound Analysis Results for the Euro Area from 1990 to 1999

Divor Dog		1.0470	0 4405	2 2800	0.0210			
Estim.	Bounds	Coeff.β	Std. Erro.	t	p-val	N. comb	% sign. coeff.	Result
Dvar = c_gdp	X = [ge	od pode]	$\mathbf{Z} = [\mathbf{bltrt}]$	bltry trop ecs	sp drid oexr	fidd fiop mopy c	uab gnsa oiim]	CI 95%
	Re	sult of EBA o	on trsp at .70 co	nfidence leve	l and maxin	$\mathbf{VIF} = 10$		
EB Max	1.8927	1.2529	0.3199	3.9165	0.1591	220 triplets	92.57%	KODUSI
EB Min	0.1615	0.8022	0.3203	2.5042	0.2419	220 triplate	59.27%	Dobust
EB Max	1.8987	1.2676	0.3156	4.0170	0.1553	66 doubles	93.66%	Robust

Robust

66 doubles

$Dvar = c_g$	dp X = [ş	geod pode]	Z = [bltrt	bltry trop ecs	sp drid oexr	fidd fiop mopy c	uab gnsa oiim]	CI 95%
Estim.	Bounds	Coeff.β	Std. Erro.	t	p-val	N. comb	% sign. coeff.	Result
Bivar Reg		-1.0470	0.4405	-2.3800	0.0210	-	-	-
EB Min	-2.1809	-1.3136	0.4337	-3.0291	0.2030	(C daublas	125.46%	Daharat
EB Max	-0.0434	-0.7603	0.3584	-2.1212	0.2805	oo doubles	72.62%	Robust
EB Min	-2.0359	-1.1628	0.4365	-2.6637	0.2286	220 1	111.06%	Dite
EB Max	-0.0333	-0.7321	0.3494	-2.0954	0.2835	220 triplets	69.92%	Robust

	Da	and of EDA						
Dvar = c_gdp	X = [ge	od pode]	z = [bltrt]	bltry trop tr	sp drid oexr	fidd fiop mopy c	uab gnsa oiim]	CI 95%
Estim.	Bounds	Coeff.ß	Std. Erro.	t	p-val	N. comb	% sign. coeff.	Result
Bivar Reg.	-	-0.0023	0.0075	-2.3100	0.0761	-	-	-
EB Min	-0.0196	-0.0104	0.0045	-2.2689	0.1249	(C daublas	451.10%	Dahmat
EB Max	-0.0040	-0.0133	0.0046	-2.8470	0.1159	oo doubles	576.88%	Robust
EB Min	-0.0180	-0.0096	0.0041	-2.2917	0.1194	220 4-1-1-4-	416.40%	Daharat
EB Max	-0.0031	-0.0119	0.0044	-2.7019	0.1382	220 triplets	516.16%	KODUST

	Re	sult of EBA o	on drid at .75 co	nfidence leve	el and maxin	num VIF = 10		
Dvar = c_gdp	X = [ge	eod pode]	Z = [bltrt	bltry trop tr	sp ecsp oexr	fidd fiop mopy c	uab gnsa oiim]	CI 95%
Estim.	Bounds	Coeff.ß	Std. Erro.	t	p-val	N. comb	% sign. coeff.	Result
Bivar Reg.	-	-1.7890	0.6175	-2.8970	0.1240	-	-	-
EB Min	-2.0575	-1.1256	0.4660	-2.4156	0.1548	66 doublas	62.92%	Dobust
EB Max	-0.2296	-1.2300	0.5002	-2.4589	0.1985	oo doubles	68.75%	Robust
EB Min	-2.4573	-1.4500	0.5036	-2.8790	0.2013	220 triplate	81.05%	Dobust
EB Max	-0.3994	-1.4111	0.5058	-2.7896	0.2001	220 triplets	78.88%	Robust

	Re	sult of EBA o	on oexr at .75 co	nfidence leve	el and maxin	num VIF = 10		
Dvar = c_gdp	X = [ge	od pode]	Z = [bltrt	bltry trop tr	sp ecsp drid	fidd fiop mopy c	uab gnsa oiim]	CI 95%
Estim.	Bounds	Coeff.ß	Std. Erro.	t	p-val	N. comb	% sign. coeff.	Result
Bivar Reg.	-	-4.7890	1.2777	-3.7480	0.0127	-	-	-
EB Min	-6.5812	-3.9550	1.3131	-3.0120	0.0125	66 doublos	82.59%	Dobust
EB Max	-1.0451	-3.1125	1.0337	-3.0111	0.0225	oo doubles	64.99%	Robust
EB Min	-5.8299	-3.5548	1.1375	-3.1250	0.0458	220 4-1-1-4-	74.23%	Dahuat
EB Max	-1.2289	-3.4412	1.1061	-3.1110	0.0458	220 triplets	71.86%	Robust

Tables 5: Continue

$\begin{aligned} \begin{aligned} & \text{Divar} = c_2 dp & X = [gcod pode] & Z = [bitr bitry trop trsp cesp drid exer flop morey cusb gens oim] \\ & \text{Bivar} Reg. & - & 0.0201 & 0.0120 & -2.6800 & 0.0990 & - & - & - & - & - & - & - & - & - & $		Re	sult of EBA o	on fidd at .70 co	nfidence leve	el and maxin	num VIF = 10							
Estim Bounds Coeff β Std. Frvo. t p-ral N. comb % sign. coeff Result EB Min -0.0467 -0.0224 0.0116 -2.0099 0.2939 66 doubles 116.40% Robust EB Min -0.0015 -0.0223 0.01112 -2.1002 0.2939 66 doubles 113.51% Robust EB Min -0.0015 -0.0223 0.01112 -2.0105 0.2937 113.51% Robust Dvar = c_gdp X [gcod pode] Z elbtrithtry trop trop cog pidd ocxf fidd mopy cub gras oim) C198% ESIM Bounds Coeff β Std. Erro. t p-ral N. comb % sign. coeff Result of EBA on mopy at .65 confidence level and maximum VIF = 10 Dvar = c_gdp X = [gcod pode] X [gcod pode] Z [bitrit bitry trop trop scop fidd ocxf fidd flop cub gras oim) C198% Bivar Reg. - 0.2377 0.1730 1.3700 0.3012 - - - - - - - -	$Dvar = c_gdp$	X = [ge	od pode]	Z = [bltrt	bltry trop trs	sp ecsp drid	oexr fiop mopy o	uab gnsa oiim]	CI 95%					
Bivar Reg	Estim.	Bounds	Coeff.β	Std. Erro.	t	p-val	N. comb	% sign. coeff.	Result					
EB Min -0.0467 -0.0234 0.0116 -2.0099 0.2393 66 doubles 116.46% Robust EB Min -0.0457 -0.0223 0.0114 -2.0062 0.2394 220 triplets 113.32% Robust EB Min -0.0457 -0.0223 0.0114 -2.0062 0.2394 220 triplets 113.32% Robust Dvar = c.gdp X = [gcod pode] Z. = Ditr bitry trop trsp esp drid over fidd mopy cub grean olim C195% EB Min 0.3569	Bivar Reg.	-	-0.0201	0.0120	-2.6800	0.0990	-	-	-					
EB Max 0.0015 0.0022 0.0114 -2.007 0.2397 220 triplets 113.91% Robust EB Max 0.0011 -0.0224 0.0121 -2.015 0.2397 220 triplets 113.91% Robust Powr = c.gdp X = [ged pode] Z = Ditor tity trop trop trop scp of diver. find mongy cuab gase olim) C1 95% Biwar Reg. - 5.5985 3.1294 1.7990 0.0552 -	EB Min	-0.0467	-0.0234	0.0116	-2.0099	0.2939	66 doubles	116.40%	Robust					
EB Min -0.0457 -0.0259 0.0114 -2.0102 0.2937 220 triplets 113.91% Robust EB Max -0.0043 -0.0121 -2.0115 0.2937 220 triplets 113.91% Robust Dvar = (ged) X = [geod podd] X N Y S sign, corf B'Max 0.3559 - 0.2371 0.1730 - - - - - - - - - - - - - - - - <td>EB Max</td> <td>-0.0015</td> <td>-0.0262</td> <td>0.0124</td> <td>-2.1207</td> <td>0.2805</td> <td>00 doubles</td> <td>130.32%</td> <td>Robusi</td>	EB Max	-0.0015	-0.0262	0.0124	-2.1207	0.2805	00 doubles	130.32%	Robusi					
EB Max 0.0001 0.0243 0.0121 -2.0115 0.2937 2.001001 120.87% Kunax Dvar = c, gdp X = [geod pode] Z = [bitr bitry trop tsp cesp did oexr fidd mopy cusb gas oim] C1 95% Estim Bounds Coeff, B< Sud. Erro.	EB Min	-0.0457	-0.0229	0.0114	-2.0062	0.2944	220 trimlate	113.91%	Dobust					
Result of EBA on flop at .75 confidence level and maximum VIF = 10 Dvar = c_gdp X = [geed pode] Z = [bitri bitry trop trap cesp drid oexr fidd mopy cuab gasa oim] CI 95% Bitran Reg. - 5.5985 S1:294 1.7890 0.0565 - - <th c<="" td=""><td>EB Max</td><td>-0.0001</td><td>-0.0243</td><td>0.0121</td><td>-2.0115</td><td>0.2937</td><td>220 triplets</td><td>120.87%</td><td>Robust</td></th>	<td>EB Max</td> <td>-0.0001</td> <td>-0.0243</td> <td>0.0121</td> <td>-2.0115</td> <td>0.2937</td> <td>220 triplets</td> <td>120.87%</td> <td>Robust</td>	EB Max	-0.0001	-0.0243	0.0121	-2.0115	0.2937	220 triplets	120.87%	Robust				
Result of EBA on fray at. 75 confidence level and maximum VFF = 10 C195% C195% C195% C195% C195% C195% C195% Bivar Reg S985 S1294 N comb % sign. coeff. C195% Bivar Reg S985 C20890 10730 0.0255 C195% Fragile Bivar Reg A colspan="2">C195% C20 triplets 71.67% Fragile Dvar = c_gdp X = [gedp dode] Z = [bittr bitty trop trays cop drid doex Tid fidt foop cub grass ofim] C195% Bivar Reg - 0.2377 0.1730 0.1730 1.7676 6 doubles 94.41% Fragile Bivar Reg - 0.2377 0.1730 0.1730 0.1730 0.1730 0.1730 0.1730 0.1730 0.172														
		Re	sult of EBA of	on fiop at .75 co	nfidence leve	l and maxin	um VIF = 10							
Estim. Bounds Coeff.µ Stdt. Erro. t p-val N. comb % sign. cceff. Result BM in 0.5369 4.7811 2.1221 2.2330 0.1025 66 doubles 74.17% Fragile BM in 0.2360 4.1023 1.8881 2.1250 0.2855 220 triplets 71.67% Fragile BMax 8.6269 4.2001 2.2134 1.8976 0.3012 220 triplets 75.02% Fragile Result of EBA on mory at .65 confidence level and maximum VIF = 10 Non 0% sign. cceff. Result of CBA on mory at .65 confidence level and maximum VIF = 10 Non 0% sign. cceff. Result of CBA on mory at .65 confidence level and maximum VIF = 10 N = [geod pode] Z = [btri thtyr trop trays cope drid over. fidd fiop mory gnsa otim] Pragile Pragile BMin 0.0377 0.2244 0.1312 1.7120 0.3317 2.00470 Pragile Dvar = c.gdp X = [geod pode] Z = [btri thtyr trop trays cope drid over. fidd fiop mory gnsa otim] C195% BMin 1.0372 2.4580 <	Dvar = c_gdp	X = [ge	od pode]	Z = [bltrt]	bltry trop tr	sp ecsp drid	oexr fidd mopy o	cuab gnsa oiim]	CI 95%					
	Estim.	Bounds	Coeff.β	Std. Erro.	ť	p-val	N. comb	% sign. coeff.	Result					
	Bivar Reg.	-	5.5985	3,1294	1.7890	0.0562	-	-	-					
	EB Min	0.5369	4.7811	2,1221	2.2530	0.1025		85.40%						
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	EB Max	8.3324	4.1526	2.0899	1,9870	0.0985	66 doubles	74.17%	Fragile					
	EB Min	0.2360	4 0123	1 8881	2 1250	0.2855		71.67%						
$\begin{tabular}{ c c c c c c c c c c c c c c c c c c c$	EB Max	8.6269	4.2001	2.2134	1.8976	0.3012	220 triplets	75.02%	Fragile					
Result of EBA on mopy at .65 confidence level and maximum VIF = 10 Dvar = c_gdp Z = [bitr bitry trop trsp esp drid oexr fidd fice cub gns a olim] CI 95% Est min - 0.2377 0.1730 1.3700 0.1750 - - EB Min -0.0354 0.2235 0.1295 0.3342 66 doubles 94.03% Fragile EB Max 0.5592 0.2838 0.1377 2.0607 0.2376 66 doubles 119.40% Fragile EB Min -0.0377 0.2244 0.1311 7122 0.0336 2.20 triplets 94.41% Fragile Dvar = c_gdp X = [gcod pode] Z = [bitri bitry trop trsp esp drid oexr fidd fiop mopy gnsa olim] CI 95% EB Min 1.0372 2.4589 0.7109 3.4590 0.0639 - - - Bivar Reg. - 2.7450 0.5732 4.7890 0.2055 56.91% Robust EB Min 1.0372 2.4589 0.7109 3.4590 0.2205 56.91% Robust														
Dvar = c_gdp Extin. X Egeod podel Std. Erro. Z Ebitit bitry trop trsp esp drid exer fidd flop cuab gnsa olim.] CI 95% Construction Bivar Reg. - 0.237 0.1730 - <td></td> <td>Pos</td> <td>ult of FBA o</td> <td>n mony at 65 c</td> <td>nfidanca lav</td> <td>al and mavin</td> <td>num VIF – 10</td> <td></td> <td></td>		Pos	ult of FBA o	n mony at 65 c	nfidanca lav	al and mavin	num VIF – 10							
Estim. Bounds Coeff β Sid. Erro. t p-val N. comb % sign. coeff. Result Bivar Reg. - 0.2377 0.1730 1.3700 0.342 66 doubles 94.03% Fragile B Max 0.5592 0.2838 0.1377 2.0607 0.2876 66 doubles 119.40% Fragile B Max 0.05299 0.2616 0.1342 1.9498 0.3017 220 triplets 94.41% Fragile B Max 0.5299 0.2616 0.1342 1.9498 0.3017 220 triplets 94.41% Fragile B Max 0.5299 0.2616 0.1342 1.9498 0.3017 220 triplets 94.03% Fragile B Var = c_gdp X [geod pode] Z = [bltrib bltry trop trsp ecsp drid over fidd form more mass and init CI 95% Result B Min 1.0372 2.4580 0.7109 3.4590 0.2205 20 triplets 95.5% Robust EB Min 0.0371 1.7893	Dvar = c_gdn	X = [ge	od podel	Z = fbltrt	bltry trop ti	'sn ecsn drid	oexr fidd fion c	uab gusa ojim]	CI 95%					
Bivar Reg. Database	Estim	Bounds	Coeff B	Std Erro	t	n-val	N comb	% sign_coeff	Result					
	Divor Dog	Dounus	0.2377	0.1730	1 3700	0.1750	ru como	70 sign. cocii.	Result					
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	ED Min	0.0254	0.2377	0.1750	1.3700	0.1730	-		-					
EB Max 0.3592 0.2838 0.1377 2.20077 0.22476 119.40% Fragile EB Max 0.5299 0.2616 0.1342 1.9498 0.3017 220 triplets 94.41% Fragile Result of EBA on cuab at .75 confidence level and maximum VIF = 10 Dvar = c_gdp X = [geod pode] Z = [bitr bitry trop trsp cesp drid oexr fidd fiop mopy gas olim] CI 95% Bitwar Reg. - 2.7450 0.732 4.780 0.6392 - - - EB Max 2.9745 0.5739 3.4520 0.1589 66 doubles 89.58% Robust EB Max 2.8702 1.9856 0.4423 4.4893 0.2232 220 triplets 56.91% Robust EB Max 2.8702 1.9856 0.4423 4.4893 0.2232 220 triplets 56.91% Robust Bounds Coeff (B Std. Erro. triplet triplet <th colspan="5" td="" tr<=""><td>EB MIII</td><td>-0.0334</td><td>0.2255</td><td>0.1295</td><td>1.7203</td><td>0.3342</td><td>66 doubles</td><td>94.05%</td><td>Fragile</td></th>	<td>EB MIII</td> <td>-0.0334</td> <td>0.2255</td> <td>0.1295</td> <td>1.7203</td> <td>0.3342</td> <td>66 doubles</td> <td>94.05%</td> <td>Fragile</td>					EB MIII	-0.0334	0.2255	0.1295	1.7203	0.3342	66 doubles	94.05%	Fragile
EB Mm -0.0377 0.2244 0.1311 1.7.122 0.3365 220 triplets 94.41% Fragile EB Max 0.5299 0.2616 0.1342 1.9498 0.3017 10.06% Fragile Result of EBA on cuab at .75 confidence level and maximum VIF = 10 Dvar = c_gdp X = [geod pode] Z = [bittr bittry trop trsp ecsp drid oexr fidd fipm mopy gras oiim] CI 95% Estim Bounds Coeff.β Std. Erro. t p-val N. comb % sign. coeff. Result Bivar Reg. - 2.7450 0.5732 4.7890 0.01589 66 doubles 65.18% Robust EB Min 0.8614 1.5623 0.3504 4.4580 0.2205 20 triplets 72.34% Robust Estim Bounds Coeff.β Std. Erro. t p-val N. comb % sign. coeff. Robust Estim 0.8614 1.5623 0.3504 4.4893 0.2225 20 triplets 94.34% Robust Bitar Reg. - 0.2198	EB Max	0.5592	0.2838	0.1377	2.0607	0.2876		119.40%	C					
EB Max 0.5299 0.2616 0.1342 1.9498 0.3017 1 110.06% 9 Result of EBA on cuab at .75 confidence level and maximum VIF = 10 Dvar = c_gdp X = [geod pode] Z = [bltrt bltry trop trsp ecsp drid oexr fidd fiop mopy gnsa oim] CI 95% Estim. Bounds Coeff. β Std. Erro. t prail N. comb % sign. coeff. Result Bivar Reg. - - - - Bivar Reg. - 2.2770 0.5730 0.1372 2.4589 0.1372 2.4589 0.2025 66 doubles 89.58% Robust Bivar Reg. - - - Bounds Coeff. β Std. Erro. t p-val N. comb % sign. coeff. Result <	EB Min	-0.0377	0.2244	0.1311	1./122	0.3365	220 triplets	94.41%	Fragile					
	ED Max	0.3299	0.2010	0.1342	1.9498	0.3017		110.00%						
Result of EBA on cuab at .75 confidence level and maximum VIF = 10 CI 95% Estim Bounds Coeff.β Std. Erro. t p-val N. comb % sign. coeff. Result Bivar Reg. - 2.7450 0.5732 4.7890 0.0639 - </td <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>														
Dvar = c_gdp X = [geod pode] Z = [hitr bitry trop trsp ecsp drid oexr fidd hop mopy gras andm] Cl 95% Estim Bounds Coeff, Std. Erro. t p-val N. comb % sign. coeff. Result Bivar Reg. - 2.7450 0.5732 4.7890 0.0639 - - - EB Max 2.9271 1.7893 0.5689 3.1452 0.2025 66 doubles 65.18% Robust EB Max 2.8702 1.9856 0.4423 4.4893 0.2322 220 triplets 56.91% Robust Dvar = c_gdp X = [geod pode] Z = [bitrt bitry trop trsp ecsp drid oexr fidd flop mopy cuab oilm] CI 95% Estim Bounds Coeff.β Std. Erro. t p-val N. comb % sign. coeff. Result Bivar Reg. - 0.2198 0.0875 2.0362 0.2906 66 doubles 104.38% Robust EB Min 0.0032 0.1781 0.0875 2.0362 0.2906 66 double	. .	Res	sult of EBA o	n cuab at .75 co	onfidence leve	el and maxir	num VIF = 10							
Estim. Bounds Coeff.β Std. Erro. t p-val N. comb % sign. coeff. Result Bivar Reg. - 2.7450 0.5732 4.7890 0.0639 -	Dvar = c_gdp	$X = \lfloor ge \rfloor$	od pode]	$\mathbf{Z} = [\mathbf{b}\mathbf{l}\mathbf{t}\mathbf{r}\mathbf{t}]$	bltry trop tr	sp ecsp drid	oexr fidd fiop m	opy gnsa olim]	CI 95%					
Bivar Reg. - 2.7450 0.5732 4.7890 0.0639 - - - - EB Min 1.0372 2.4589 0.7109 3.4590 0.1589 66 doubles 65.18% Robust EB Min 0.8614 1.5623 0.3504 4.4580 0.2205 220 triplets 56.91% Robust EB Max 2.8702 1.9856 0.4423 4.4893 0.2322 220 triplets 72.34% Robust Dvar = c_gdp X = [geod pode] Z = [bltrt bltry trop trsp ecsp drid oexr fidd fiop mopy cuab oim] CI 95% Bivar Reg. - 0.2198 0.1087 2.0200 0.0480 - <td< td=""><td>Estim.</td><td>Bounds</td><td>Coeff.ß</td><td>Std. Erro.</td><td>t</td><td>p-val</td><td>N. comb</td><td>% sign. coeff.</td><td>Result</td></td<>	Estim.	Bounds	Coeff.ß	Std. Erro.	t	p-val	N. comb	% sign. coeff.	Result					
EB Min 1.0372 2.4589 0.7109 3.4590 0.1589 66 doubles 89.58% Robust EB Max 2.9271 1.7893 0.5689 3.1452 0.2025 220 triplets 56.91% 72.34% Robust EB Max 2.8702 1.9856 0.4423 4.4893 0.2322 220 triplets 56.91% 72.34% Robust Dvar c ggod pdel Z e [btrt blty trop trsp esp drid oexr fidd fiop mopy cuab oim] CI 95% Estim. Bounds Coeff.β Std. Erro. t p-val N. comb % sign. coeff. Result Bivar Reg. - 0.2198 0.1087 2.0200 0.0480 -	Bivar Reg.	-	2.7450	0.5732	4.7890	0.0639	-	-	-					
EB Max 2.9271 1.7893 0.5689 3.1452 0.2025 b6 doubles 65.18% Robust EB Min 0.8614 1.5623 0.3504 4.4580 0.2025 220 triplets 56.91% Robust EB Max 2.8702 1.9856 0.4423 4.4893 0.2322 220 triplets 56.91% Robust Dvar = c_gdp X = [geod pode] Z = [bltt bltry trop trsp ccsp drid oexr fidd fiop mopy cuab oim] CI 95% Estim. Bounds Coeff.β Std. Erro. t p-val N. comb % sign. coeff. Result Bivar Reg. - 0.2198 0.0087 2.0200 0.0480 - </td <td>EB Min</td> <td>1.0372</td> <td>2.4589</td> <td>0.7109</td> <td>3.4590</td> <td>0.1589</td> <td><i>((</i>1, 11))</td> <td>89.58%</td> <td>Dita</td>	EB Min	1.0372	2.4589	0.7109	3.4590	0.1589	<i>((</i> 1, 11))	89.58%	Dita					
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	EB Max	2.9271	1.7893	0.5689	3.1452	0.2025	66 doubles	65.18%	Robust					
Bit Max 0.0011 10.005 0.2322 220 triplets 0.011% Robust EB Max 2.8702 1.9856 0.4423 4.4893 0.2322 220 triplets 72.34% Robust Dvar = c_gdp K = [geod pode] Z = [bltrt bltry trop trsp essp drid oexr fidd fiop mopy cuab olim] Cf 95% Estim. Bounds Coeff.6 Std. Erro. t p-val N. comb % sign. coeff. Result Bivar Reg. - 0.2198 0.1087 2.0200 0.0480 - </td <td>EB Min</td> <td>0.8614</td> <td>1 5623</td> <td>0 3504</td> <td>4 4580</td> <td>0 2205</td> <td></td> <td>56.91%</td> <td></td>	EB Min	0.8614	1 5623	0 3504	4 4580	0 2205		56.91%						
Bornal Dote Original Original <thoriginal< th=""> <thoriginal< th=""> <thori< td=""><td>EB Max</td><td>2.8702</td><td>1 9856</td><td>0.4423</td><td>4 4893</td><td>0.2322</td><td>220 triplets</td><td>72.34%</td><td>Robust</td></thori<></thoriginal<></thoriginal<>	EB Max	2.8702	1 9856	0.4423	4 4893	0.2322	220 triplets	72.34%	Robust					
Result of EBA or gasa at .70 confidence level and maximum VIF = 10 CI 95% Dvar = c_gdp X = [geod pode] Z = [bltrt bltry trop trsp ecsp drid oexr fidd fiop mopy cuab olim] CI 95% Estim. Bounds Coeff. β Std. Erro. t p-val N. comb % sign. coeff. Result Bivar Reg. - 0.2198 0.1087 2.0200 0.0480 - - - EB Min 0.0032 0.1781 0.0875 2.0362 0.2906 66 doubles 81.04% Robust EB Max 0.4123 0.2294 0.0915 2.5084 0.2415 66 doubles 81.04% Robust EB Max 0.3821 0.2073 0.0874 2.3715 0.2540 220 triplets 94.32% Robust Dvar = c_gdp X = [geod Pode] Z = [bltrt bltry trop trsp ecsp trid oexr fidd fiop mopy cub gnsa] CI 95% Estim. Bounds Coeff. β Std. Erro. t p-val N. comb % sign. coeff. Result Bivar Reg. - 0.2097		2107.02	11,000	011120		0.120 22		7210170						
Network of EDA on gins at 7.0 confidence level and maximum VIF = 10 CI 95% Estim. Bounds Coeff. β Std. Erro. t p-val N. comb % sign. coeff. Result Bivar Reg. - 0.2198 0.1087 2.0200 0.0480 - - - EB Min 0.0032 0.1781 0.0875 2.0362 0.2906 66 doubles 81.04% Robust EB Min 0.0020 0.1792 0.0886 2.027 0.2923 220 triplets 81.54% Robust EB Max 0.3821 0.2073 0.0874 2.3715 0.2540 220 triplets 94.32% Robust Dvar = c_gdp X = [geod pode] Z = [bltrt bltry trop trsp ecsp drid oexr fidd fiop mopy cuab gnsa] CI 95% Estim. Bounds Coeff. β Std. Erro. t p-val N. comb % sign. coeff. Result Bivar Reg. - 0.2097 0.0807 2.20015 0.2950 66 doubles 108.05% Robust <t< td=""><td></td><td>Ro</td><td>sult of FRA of</td><td>n anso of 70 co</td><td>nfidanca lav</td><td>al and mavir</td><td>num VIF – 10</td><td></td><td></td></t<>		Ro	sult of FRA of	n anso of 70 co	nfidanca lav	al and mavir	num VIF – 10							
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	Dvar – c. adn	V - [go	od nodel	7 - fbltrt	hltry trop tr	en acen drid	oovr fidd fion m	ony cush ojim]	CT 05%					
Estin. Bounds Coeff.p Sult. Prio. t p-val N. comb % sign. coeff. Result Bivar Reg. - 0.2198 0.0875 2.0362 0.2906 66 doubles 81.04% EB Min 0.0020 0.1792 0.0886 2.0227 0.2923 220 triplets 81.54% Robust EB Max 0.3821 0.2073 0.0874 2.3715 0.2540 220 triplets 94.32% Robust Result of EBA on oim at .70 confidence level and maximum VIF = 10 Dvar = c_gdp X = [geod pode] Z = [bitrt bitry trop trsp ecsp drid oexr fidd fiop mopy cuab gnsa] CI 95% EStin. Bounds Coeff.β Std. Erro. t p-val N. comb % sign. coeff. Result Bivar Reg. - 0.2097 0.0807 2.6000 0.1150 - - - - - EB Min 0.0028 0.2148 0.1086 2.3112 0.2980 220 triplets 102.42% Robust	Dvar = c_gup	A – [gc	Caseff P	$\Sigma = [Ditit$	bitty trop th	sp ecsp unu	N somb		Daaml4					
Bivar Reg0.21980.10872.02000.0480EB Min0.00320.17810.08752.03620.290666 doubles81.04%RobustEB Max0.41230.22940.09152.50840.241566 doubles104.38%RobustEB Max0.38210.20730.08742.37150.2540220 triplets81.54%94.32%EB Max0.38210.20730.08742.37150.2540220 triplets94.32%Robust Bey and State Result of EBA on olim at .70 confidence level and maximum VIF = 10Dvar = c_gdpX = [geod pode]Z = [bitri bitry trop trsp ecsp drid oexr fidd fiop mopy cuab gnsa] CI 95% EB Min 0.00020.21760.11322.00150.2950 Bin 0.002890.21480.11662.1215 Result of EBA on good at .75 confidence level and maximum VIF = 10Dvar = c_gdpX = [pode]Z = [bitri bitry trop trsp ecsp drid oexr fidd fiop mopy cuab gnsa] CI 95%EB Min0.022970.20970.20150.295066 doubles108.05%Powel0.20970.20150.22950EB Min <td colsp<="" td=""><td>Esuili.</td><td>Dounus</td><td>Coen.p</td><td>Stu. EITO.</td><td>ι</td><td>p-vai</td><td>N. COIIID</td><td>76 sign. coen.</td><td>Result</td></td>	<td>Esuili.</td> <td>Dounus</td> <td>Coen.p</td> <td>Stu. EITO.</td> <td>ι</td> <td>p-vai</td> <td>N. COIIID</td> <td>76 sign. coen.</td> <td>Result</td>	Esuili.	Dounus	Coen.p	Stu. EITO.	ι	p-vai	N. COIIID	76 sign. coen.	Result				
EB Min0.00320.17810.08752.03620.2906 constance66 doubles81.04% 104.38%RobustEB Max0.41230.22940.09152.50840.241566 doubles104.38%RobustEB Min0.00200.17920.08862.02270.2923220 triplets81.54% 94.32%RobustEB Max0.38210.20730.08742.37150.254020 triplets94.32%Robust Result of EBA on olim at .70 confidence level and maximum VIF = 10Dvar = c_gdp X= [geod pode]Z= [bltrt bltry trop trsp ecsp drid oexr fidd fiop more trab gnsa]CI 95% ResultBivar Reg0.20970.08072.60000.1150EB Min0.00020.22660.11322.00150.295066 doubles108.05% 113.29%RobustEB Min0.02890.21480.10862.31120.2980220 triplets102.42% 121.59%Robust Result of EBA on geod at .75 confidence level and maximum VIF = 10Dvar = c_gdp X= [pode]Z= [bltrt bltry trop trsp ecsp drid oexr fidd fiop more trab gnsa olim] 0.2577CI 95% 21 tripletsBoundsCoeff.βStd. Erro.tp-valN. comb% sign. coeff. ResultB Max0.47350.25400.4235EB Min-1.4325-0.78960.3215<	Bivar Reg.	-	0.2198	0.1087	2.0200	0.0480	-	-	-					
EB Max0.41230.22940.09152.50840.241500 doubles104.38%RobustEB Min0.00200.17920.08862.02270.2923220 triplets $\$1.54\%$ 94.32%RobustEB Max0.38210.20730.08742.37150.2540220 triplets $\$1.54\%$ 94.32%Robust Result of EBA on oim at .70 confidence level and maximum VIF = 10Dvar = c_gdpX = [geod pode]Z = [bltrt bltry trop trsp ecsp drid oexr fidd fiop mopy cuab gnsa] CI 95% ResultBivar Reg0.20970.08072.60000.1150EB Min0.00020.22660.11322.00150.295066 doubles118.05% 113.29%RobustEB Min0.02890.21480.10862.31120.2980 2.3340220 triplets102.42% 121.59%Robust Result of EBA on geod at .75 confidence level and maximum VIF = 10Dvar = c_gdpX = [pode]Z = [bltrt bltry trop trsp ecsp drid oexr fidd fiop mopy cuab gnsa oiim] 121.59%CI 95% RobustEB Max0.47350.25500.10932.33400.2577220 triplets102.42% 121.59%RobustBivar Reg0.08960.0321-2.78900.1235EB Min-1.4325-0.78960.3215-2.45600.4563 2.055366 doubles881.60% 733.59%RobustBivar Reg0.08960.0321-2.45600.4	EB Min	0.0032	0.1781	0.0875	2.0362	0.2906	66 doubles	81.04%	Robust					
EB Min EB Max0.0020 0.38210.1792 0.20730.0886 0.08742.0227 2.37150.2923 0.2540220 triplets 81.54% 94.32%RobustResult of EBA on oim at .70 confidence level and maximum VIF = 10Dvar = c_gdpX = [geod pode]Z = [bltrt bltry trop trsp ecsp drid oexr fidd fiop mopy cuab gnsa]CI 95% 8 sign. coeff.Bivar Reg0.20970.0807 0.08072.600 2.00150.1150 0.2950EB Min EB Max0.0002 0.02890.22660.1132 0.23762.0015 0.11160.2950 2.112266 doubles 0.2950 113.29%108.05% 108.05% 113.29%RobustResult of EBA on geod at .75 confidence level and maximum VIF = 10Dvar = c_gdpX = [pode]Z = [bltrt bltry trop trsp ecsp drid oexr fidd fiop mopy cuab gnsa oim] 1.3.29%CI 95% RobustB Max0.4609 0.42350.2376 0.10930.1086 2.33400.2577 0.2570220 triplets 102.42% 121.59%CI 95% RobustDvar = c_gdpX = [pode]Z = [bltrt bltry trop trsp ecsp drid oexr fidd fiop mopy cuab gnsa oim] 121.59%CI 95% ResultBivar Reg0.0896 0.03211-2.7890 -2.45600.1235 0.1235EB Min-1.4325 -0.7896-0.3215 0.3215-2.4560 -2.45600.4563 0.456366 doubles 73.59%881.60% 73.59%Robust RobustBivar Reg0.08960.03215 -2.4560 <th< td=""><td>EB Max</td><td>0.4123</td><td>0.2294</td><td>0.0915</td><td>2.5084</td><td>0.2415</td><td>00 0000103</td><td>104.38%</td><td>Robust</td></th<>	EB Max	0.4123	0.2294	0.0915	2.5084	0.2415	00 0000103	104.38%	Robust					
EB Max 0.3821 0.2073 0.0874 2.3715 0.2540 220 triplets 94.32% Robust Dvar = c_gdp Result of EBA on oim at .70 confidence level and maximum VIF = 10 Dvar = c_gdp X = [geod pode] Z = [bltrt bltry trop trsp ecsp drid oexr fidd fiop mopy cuab gnsa] CI 95% Estim. Bounds Coeff. β Std. Erro. t p-val N. comb % sign. coeff. Result Bivar Reg. - 0.2097 0.0807 2.6000 0.1150 -	EB Min	0.0020	0.1792	0.0886	2 0227	0.2923		01 5 40/						
Result of EBA or otim at .70 confidence level and maximum VIF = 10 CI 95% Dvar = c_gdp X = [geot pode] Z = [bltt bltry trop trsp ecsp drid oexr fidd fiop moy cub gnsa] CI 95% Estim. Bounds Coeff.β Std. Erro. t p-val N. comb % sign. coeff. Result Bivar Reg. - 0.2097 0.0807 2.6000 0.1150 - - - - - - Result Result Bivar Reg. - 0.2097 0.0807 2.0015 0.2950 66 doubles 108.05% Robust EB Min 0.0289 0.2148 0.1086 2.3112 0.2980 20 triplets 102.42% Robust EB Max 0.4735 0.2550 0.1093 2.340 0.2577 20 triplets 102.42% Robust EB Max 0.4735 0.2550 0.1093 2.340 0.2577 20 triplets gras a oim CI 95% Boards Coeff.β Std. Erro. t p-val	EB Max			0.0000	2.0227	0.2725	220 4-1-1-4-	81.54%	Dahaat					
Result of EBA on oim at .70 confidence level and maximum VIF = 10 Dvar = c_gdp X = [geod pode] Z = [bltrt bltry trop trsp ecsp drid oexr fidd fiop mopy cuab gnsa] CI 95% Estim. Bounds Coeff.β Std. Erro. t p-val N. comb % sign. coeff. Result Bivar Reg. - 0.2097 0.0807 2.6000 0.1150 - - - EB Min 0.0002 0.2266 0.1132 2.0015 0.2950 66 doubles 108.05% Result EB Max 0.4609 0.2376 0.1116 2.1285 0.2796 66 doubles 102.42% Robust EB Max 0.4735 0.2550 0.1093 2.3340 0.2577 220 triplets 102.42% Robust EB Max 0.4735 0.2550 0.1093 2.3340 0.2577 220 triplets 102.42% Result Dvar = c_gdp X = [pode] Z = [bltrt bltry trop trsp ecsp drid oexr fidd fiop mopy cuab gnsa oim] CI 95% Bivar Reg. - <td>EB Maat</td> <td>0.3821</td> <td>0.2073</td> <td>0.0874</td> <td>2.3715</td> <td>0.2540</td> <td>220 triplets</td> <td>81.54% 94.32%</td> <td>Robust</td>	EB Maat	0.3821	0.2073	0.0874	2.3715	0.2540	220 triplets	81.54% 94.32%	Robust					
Dvar = c_gdp X = [gev pode] Z = [bltr bltry trop trsp ecsp drid very fidd fiop moy cub gnsa] CI 95% Result Estim. Bounds Coeff.β Std. Erro. t p-val N. comb % sign. coeff. Result Result Bivar Reg. - 0.2097 0.0807 2.6000 0.1150 -		0.3821	0.2073	0.0874	2.3715	0.2540	220 triplets	81.54% 94.32%	Robust					
Estim.BoundsCoeff.βStd. Erro.tp-valN. comb% sign. coeff.ResultBivar Reg0.20970.08072.60000.1150EB Min0.00020.22660.11322.00150.295066 doubles108.05%RobustEB Max0.46090.23760.11162.12850.279666 doubles113.29%RobustEB Min0.02890.21480.10862.31120.2980220 triplets102.42%RobustEB Max0.47350.25500.10932.33400.2577220 triplets102.42%RobustDvar = c_gdpX = [pode]Z = [bltrt bltry trop trsp ecsp drid oexr fidd fiop mopy cuab gnsa oim]CI 95%Estim.BoundsCoeff.βStd. Erro.tp-valN. comb% sign. coeff.ResultBivar Reg0.08960.0321-2.78900.1235EB Min-1.4325-0.78960.3215-2.45600.456366 doubles733.59%RobustEB Min-1.4297-0.78990.3199-2.46900.4521220 triplets881.92%RobustEB Min-1.4297-0.98600.4246-2.32200.3003220 triplets881.92%Robust		0.3821 Re:	0.2073	0.0874	2.3715	0.2540	220 triplets	81.54% 94.32%	Robust					
Bivar Reg. - 0.2097 0.0807 2.6000 0.1150 - <	Dvar = c_gdp	0.3821 Res X = [ge	0.2073 sult of EBA c	0.0874 0.0874 01 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2.3715 nfidence leve	0.2540 el and maxin	220 triplets num VIF = 10 oexr fidd fiop m	81.54% 94.32%	Robust					
EB Min 0.0002 0.2266 0.1132 2.0015 0.2950 66 doubles 108.05% Robust EB Max 0.4609 0.2376 0.1116 2.1285 0.2796 66 doubles 113.29% Robust EB Min 0.0289 0.2148 0.1086 2.3112 0.2980 220 triplets 102.42% Robust EB Max 0.4735 0.2550 0.1093 2.3340 0.2577 220 triplets 102.42% Robust Dvar = c_gdp X = [pode] Z = [bltt bltry trop trsp ecsp drid oexr fidd fiop mopy cuab gnsa oim] CI 95% Estim Bounds Coeff. β Std. Erro. t p-val N. comb % sign. coeff. Result Bivar Reg. - -0.0896 0.3215 -2.4560 0.4563 - - - EB Min -1.4325 -0.7896 0.3215 -2.4560 0.4563 66 doubles 733.59% Robust EB Max -0.1367 -0.9860 0.4246 -2.3220 0.3003 220 triplets 1100.94% Robust	Dvar = c_gdp Estim.	0.3821 Re: X = [ge Bounds	0.2073 sult of EBA of od pode] Coeff.ß	0.0874 0.0874 0n oiim at .70 co Z = [bltrt Std. Erro.	2.3715 nfidence leve bltry trop tr	0.2540 el and maxin sp ecsp drid p-val	220 triplets num VIF = 10 oexr fidd fiop m N. comb	81.54% 94.32% opy cuab gnsa] % sign. coeff.	Robust CI 95% Result					
EB Max 0.6002 0.1200 0.1102 2.1285 0.2796 66 doubles 100.050 Robust EB Max 0.4609 0.2376 0.1116 2.1285 0.2796 66 doubles 113.29% Robust EB Min 0.0289 0.2148 0.1086 2.3112 0.2980 220 triplets 102.42% Robust EB Max 0.4735 0.2550 0.1093 2.3340 0.2577 220 triplets 102.42% Robust Result of EBA on geod at .75 confidence level and maximum VIF = 10 Estim. Bounds Coeff.β Std. Erro. t p.val N. comb $\%$ sign. coeff. Result Bivar Reg. - -0.0896 0.3215 -2.7890 0.1235 - - - EB Min -1.4325 0.7896 0.3215 -2.4560 0.4563 66 doubles 733.59% Robust EB Min -1.4297 0.7896 0.3199 -2.4690 0.4521 220 triplets <	Dvar = c_gdp Estim. Bivar Reg.	0.3821 Res X = [ge Bounds	0.2073 sult of EBA (od pode] <u>Coeff.β</u> 0.2097	0.0874 0.0874 0.0874 0.0807 0.0807	2.3715 nfidence leve bltry trop tr t 2.6000	0.2540 el and maxin sp ecsp drid p-val 0.1150	220 triplets num VIF = 10 oexr fidd fiop m N. comb	81.54% 94.32% opy cuab gnsa] % sign. coeff.	Robust CI 95% Result					
Eb Max 0.4007 0.2370 0.1110 2.1283 0.2790 113.29% EB Min 0.0289 0.2148 0.1086 2.3112 0.2980 220 triplets 102.42% 102.42% EB Max 0.4735 0.2550 0.1093 2.3340 0.2577 220 triplets 121.59% Robust Result of EBA on geod at .75 confidence level and maximum VIF = 10 Dvar = c_gdp X = [pode] Z = [bltrt bltry trop trsp ecsp drid oexr fidd fiop mopy cuab gnsa oiim] CI 95% Estim Bounds Coeff.β Std. Erro. t p-val N. comb % sign. coeff. Result Bivar Reg. - -0.0896 0.0321 -2.7890 0.1235 - - - EB Min -1.4325 -0.7896 0.3215 -2.4560 0.4563 66 doubles 733.59% Robust EB Min -1.4297 -0.7899 0.3199 -2.4690 0.4521 220 triplets 881.92% Robust EB Max -0.1367 -0.9860 0.4246 -2.3220 0.3003 220 triplets 881.9	Dvar = c_gdp Estim. Bivar Reg. EB Min	0.3821 Re: X = [ge Bounds	0.2073 sult of EBA (od pode] Coeff.β 0.2097 0.2266	0.0874 0.0874 0.0807 0.0807 0.1132	2.3715 nfidence leve bltry trop tr t 2.6000 2.0015	0.2540 el and maxim sp ecsp drid p-val 0.1150 0.2950	220 triplets num VIF = 10 oexr fidd fiop m N. comb	81.54% 94.32% opy cuab gnsa] % sign. coeff.	Robust CI 95% Result					
EB Min 0.0289 0.2148 0.1086 2.3112 0.2980 220 triplets 102.42% Robust EB Max 0.4735 0.2550 0.1093 2.3340 0.2577 220 triplets 102.42% Robust Dvar = c_gdp Result of EBA on geod at .75 confidence level and maximum VIF = 10 Dvar = c_gdp X = [pode] Z = [bltrt bltry trop trsp ccsp drid oexr fidd fiop mopy cuab gnsa oiim] CI 95% Estim Bounds Coeff. β Std. Erro. t p-val N. comb % sign. coeff. Result Bivar Reg. - -0.0896 0.0321 -2.7890 0.1235 - - - EB Min -1.4325 -0.7896 0.3215 -2.4560 0.4563 66 doubles 733.59% Robust EB Min -1.4297 -0.7899 0.3199 -2.4690 0.4521 220 triplets 881.92% Robust EB Max -0.1367 -0.9860 0.4246 -2.3220 0.3003 220 triplets 881.92% Robust	Dvar = c_gdp Estim. Bivar Reg. EB Min EB Max	0.3821 Re: X = [ge Bounds - 0.0002 0.4600	0.2073 sult of EBA (od pode] <u>Coeff.β</u> 0.2097 0.2266 0.2376	0.0874 0.0874 0.0874 0.0807 0.1132 0.1116	2.3715 nfidence leve bltry trop tr t 2.6000 2.0015 2.1285	0.2540 el and maxim sp ecsp drid p-val 0.1150 0.2950 0.2796	220 triplets num VIF = 10 oexr fidd fiop m N. comb - 66 doubles	81.54% 94.32% opy cuab gnsa] % sign. coeff. - 108.05%	Robust CI 95% Result - Robust					
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	Dvar = c_gdp Estim. Bivar Reg. EB Min EB Max	0.3821 Re: X = [ge Bounds 0.0002 0.4609 0.0280	0.2073 sult of EBA c od pode] Coeff.β 0.2097 0.2266 0.2376 0.2148	0.0874 0.0874 0.0874 0.0807 0.1132 0.1116 0.1086	2.3715 nfidence leve bltry trop tr t 2.6000 2.0015 2.1285 2.2112	0.2540 el and maxim sp ecsp drid p-val 0.1150 0.2950 0.2796 0.2020	220 triplets num VIF = 10 oexr fidd fiop m N. comb	81.54% 94.32% opy cuab gnsa] % sign. coeff. - 108.05% 113.29%	Robust CI 95% Result - Robust					
Result of EBA used at .75 confidence level and maximum VIF = 10Dvar = c_gdpX = [pode]Z = [bltrt bltry trop trsp ecsy drid over fidd fiop moy vub gnsa oim]CI 95%Estim.BoundsCoeff. β Std. Erro.tp-valN. comb% sign. coeff.ResultBivar Reg0.08960.0321-2.78900.1235EB Min-1.4325-0.78960.3215-2.45600.4563-66 doubles881.60%RobustEB Min-1.4297-0.78990.3199-2.46900.4521-881.92%RobustEB Max-0.1367-0.98600.4246-2.32200.3003-881.92%Robust	Dvar = c_gdp Estim. Bivar Reg. EB Min EB Max EB Min	0.3821 Re: X = [ge Bounds 0.0002 0.4609 0.0289	0.2073 sult of EBA c od pode] Coeff.β 0.2097 0.2266 0.2376 0.2148	0.0874 0.0874 0.0874 0.0807 0.1132 0.1116 0.1086 0.1086	2.3217 2.3715 nfidence leve bltry trop tr 2.6000 2.0015 2.1285 2.3112	0.2540 el and maxim sp ecsp drid p-val 0.1150 0.2950 0.2796 0.2980	220 triplets num VIF = 10 oexr fidd fiop m N. comb - 66 doubles 220 triplets	81.54% 94.32% opy cuab gnsa] % sign. coeff. - 108.05% 113.29% 102.42%	Robust CI 95% Result Robust Robust					
Result of EBA or geod at .75 confidence level and maximum VIF = 10 Dvar = c_gdp X = [pde] Z = [bitri bitry trop trsp ecsp drid over fidd fiop mopy cub gnsa oiin] CI 95% Estim. Bounds Coeff. β Std. Erro. t p-val N. comb % sign. coeff. Result Bivar Reg. - -0.0896 0.0321 -2.7890 0.1235 - - - EB Min -1.4325 -0.7896 0.3215 -2.4560 0.4563 66 doubles 881.60% Robust EB Min -1.4297 -0.7899 0.3199 -2.4690 0.4521 220 triplets 881.92% Robust	Dvar = c_gdp Estim. Bivar Reg. EB Min EB Max EB Min EB Max	0.3821 Re: X = [ge Bounds - 0.0002 0.4609 0.0289 0.4735	0.2073 sult of EBA c od pode] Coeff.β 0.2097 0.2266 0.2376 0.2148 0.2550	0.0874 0.0874 0.0874 0.0807 0.1132 0.1116 0.1086 0.1093	2.3217 2.3715 nfidence leve bltry trop tr 2.6000 2.0015 2.1285 2.3112 2.3340	0.2540 el and maxim sp ecsp drid p-val 0.1150 0.2950 0.2796 0.2980 0.2577	220 triplets num VIF = 10 oexr fidd fiop m N. comb - 66 doubles 220 triplets	81.54% 94.32% opy cuab gnsa] % sign. coeff. - 108.05% 113.29% 102.42% 121.59%	Robust CI 95% Result - Robust Robust					
Dvar = c_gdp X = [pode] Z = [bitrt bitry trop trsp ecsp drid oexr fidd fiop mopy cub gnsa oiim] CI 95% Estim. Bounds Coeff. β Std. Erro. t p-val N. comb % sign. coeff. Result Bivar Reg. - -0.0896 0.0321 -2.7890 0.1235 - - - - EB Min -1.4325 -0.7896 0.3215 -2.4560 0.4563 66 doubles 881.60% Robust EB Max -0.1444 -0.6570 0.2563 -2.5632 0.2598 66 doubles 733.59% Robust EB Min -1.4297 -0.7896 0.3199 -2.4690 0.4521 220 triplets 881.92% Robust	Dvar = c_gdp Estim. Bivar Reg. EB Min EB Max EB Min EB Max	0.3821 Re: X = [ge Bounds 0.0002 0.4609 0.0289 0.4735	0.2073 sult of EBA c od pode] <u>Coeff.β</u> 0.2097 0.2266 0.2376 0.2148 0.2550	0.0874 0.0874 0.0874 0.0807 0.1132 0.1116 0.1086 0.1093	2.3217 2.3715 nfidence leve bltry trop tr 2.6000 2.0015 2.1285 2.3112 2.3340	0.2540 el and maxim sp ecsp drid p-val 0.1150 0.2950 0.2796 0.2980 0.2577	220 triplets num VIF = 10 oexr fidd fiop m N. comb - 66 doubles 220 triplets	81.54% 94.32% opy cuab gnsa] % sign. coeff. - 108.05% 113.29% 102.42% 121.59%	Robust CI 95% Result Robust					
Estime Dounds Coeff.p Std. Erro. t p-val N. comb % sign. coeff. Result Bivar Reg. - -0.0896 0.0321 -2.7890 0.1235 -	Dvar = c_gdp Estim. Bivar Reg. EB Min EB Max EB Min EB Max	0.3821 Res X = [ge Bounds 0.0002 0.4609 0.0289 0.4735 Res	0.2073 sult of EBA c od pode] Coeff.β 0.2097 0.2266 0.2376 0.2148 0.2550 sult of EBA c	0.0874 0.0874 0.0807 0.1132 0.1116 0.1086 0.1093 0.1093	2.3217 2.3715 nfidence level bltry trop tr 2.6000 2.0015 2.1285 2.3112 2.3340 nfidence level	0.2540 el and maxim sp ecsp drid p-val 0.1150 0.2950 0.2796 0.2980 0.2577 el and maxim	220 triplets num VIF = 10 oexr fidd fiop m N. comb - 66 doubles 220 triplets num VIF = 10	81.54% 94.32% opy cuab gnsa] % sign. coeff. 108.05% 113.29% 102.42% 121.59%	Robust CI 95% Result Robust Robust					
Bivar Reg. - -0.0896 0.0321 -2.7890 0.1235 -	Dvar = c_gdp Estim. Bivar Reg. EB Min EB Max EB Min EB Max Dvar = c_gdp	0.3821 Res X = [ge Bounds - 0.0002 0.4609 0.0289 0.4735 Res X = Bounds	0.2073 sult of EBA (od pode] Coeff.β 0.2097 0.2266 0.2376 0.2148 0.2148 0.2550 sult of EBA ([pode] Coeff.β	0.0874 0.0874 0 oiim at .70 co Z = [bltrt Std. Erro. 0.0807 0.1132 0.1116 0.1086 0.1093 0.1093 0.1093	2.3217 2.3715 nfidence leve bltry trop tr t 2.6000 2.0015 2.1285 2.3112 2.3340 nfidence leve ry trop tr	0.2540 el and maxin sp ecsp drid p-val 0.1150 0.2950 0.2796 0.2980 0.2577 el and maxin ecsp drid oc	220 triplets num VIF = 10 oexr fidd fiop m N. comb 66 doubles 220 triplets num VIF = 10 cr fidd fiop mopy N. comb	81.54% 94.32% opy cuab gnsa] % sign. coeff. - 108.05% 113.29% 102.42% 121.59%	CI 95% Result Robust CI 95%					
EB Min -1.4325 -0.7896 0.3215 -2.4560 0.4563 66 doubles 881.60% Robust EB Max -0.1444 -0.6570 0.2563 -2.5632 0.2598 66 doubles 733.59% Robust EB Min -1.4297 -0.7899 0.3199 -2.4690 0.4521 220 triplets 881.92% Robust EB Max -0.1367 -0.9860 0.4246 -2.3220 0.3003 220 triplets 1100.94% Robust	Dvar = c_gdp Estim. Bivar Reg. EB Min EB Max EB Min EB Max Dvar = c_gdp Estim	0.3821 Re: X = [ge Bounds 0.0002 0.4609 0.0289 0.4735 Re: X = Bounds	0.2073 sult of EBA c od pode] Coeff.β 0.2097 0.2266 0.2376 0.2148 0.2550 sult of EBA c [pode] Coeff.β 2.000 f	0.0874 0.0874 0.0807 0.1132 0.1116 0.1086 0.1093 0.1093 0.1093 0.1093	2.3217 2.3715 nfidence level bltry trop tr t 2.6000 2.0015 2.1285 2.3112 2.3340 nfidence level ry trop trsp of t 2.5000	0.2540 el and maxim sp ecsp drid p-val 0.1150 0.2950 0.2796 0.2980 0.2577 el and maxim ecsp drid oex p-val 0.150 cosp 0.2577	220 triplets num VIF = 10 oexr fidd fiop m N. comb - 66 doubles 220 triplets num VIF = 10 cr fidd fiop mopy N. comb	81.54% 94.32% opy cuab gnsa] % sign. coeff. - 108.05% 113.29% 102.42% 121.59% / cuab gnsa oiim] % sign. coeff.	CI 95% Robust Robust CI 95% Result					
EB Max -0.1444 -0.6570 0.2563 -2.5632 0.2598 00 utubles 733.59% Robust EB Min -1.4297 -0.7899 0.3199 -2.4690 0.4521 220 triplets 881.92% Robust EB Max -0.1367 -0.9860 0.4246 -2.3220 0.3003 220 triplets 1100.94% Robust	Dvar = c_gdp Estim. Bivar Reg. EB Min EB Max EB Min EB Max Dvar = c_gdp Estim. Bivar Reg.	0.3821 Re: X = [ge Bounds 0.0002 0.4609 0.0289 0.4735 Re: X = Bounds	0.2073 sult of EBA (od pode] Coeff.β 0.2097 0.2266 0.2376 0.2148 0.2550 sult of EBA ([pode] Coeff.β -0.0896	0.0874 0.0874 0.0874 0.0807 0.1132 0.1116 0.1086 0.1093 0.00321 0	2.3217 2.3715 nfidence leve bltry trop tr 2.6000 2.0015 2.1285 2.3112 2.3340 nfidence leve ry trop trsp o t -2.7890	0.2540 el and maxim sp ecsp drid p-val 0.1150 0.2950 0.2796 0.2980 0.2577 el and maxim ecsp drid oes p-val 0.1235	220 triplets num VIF = 10 oexr fidd fiop m N. comb - 66 doubles 220 triplets num VIF = 10 cr fidd fiop mopy N. comb	81.54% 94.32% opy cuab gnsa] % sign. coeff. - 108.05% 113.29% 102.42% 121.59% / cuab gnsa oiim] % sign. coeff. -	CI 95% Result Robust CI 95% Result					
EB Min -1.4297 -0.7899 0.3199 -2.4690 0.4521 220 triplets 881.92% EB Max -0.1367 -0.9860 0.4246 -2.3220 0.3003 220 triplets 1100.94% Robust	Dvar = c_gdp Estim. Bivar Reg. EB Min EB Max EB Min EB Max Dvar = c_gdp Estim. Bivar Reg. EB Min	0.3821 Re: X = [ge Bounds - 0.0002 0.4609 0.0289 0.4735 Res X = Bounds	0.2073 sult of EBA c od pode] Coeff.β 0.2097 0.2266 0.2376 0.2148 0.2550 sult of EBA c [pode] Coeff.β -0.0896 -0.7896	0.0874 0.0874 X = [bltrt Std. Erro. 0.0807 0.1132 0.1116 0.1086 0.1093 x = [bltrt bltt Std. Erro. 0.0321 0.3215	2.3715 nfidence leve blty trop tr t 2.6000 2.0015 2.1285 2.3112 2.3340 nfidence leve ry trop trsp of t -2.7890 -2.4560	0.2540 el and maxin sp ecsp drid p-val 0.1150 0.2950 0.2796 0.2980 0.2577 el and maxin ecsp drid oes p-val 0.1235 0.4563	220 triplets num VIF = 10 oexr fidd fiop m N. comb - 66 doubles 220 triplets num VIF = 10 cr fidd fiop mopy N. comb - 66 doubles	81.54% 94.32% opy cuab gnsa] % sign. coeff. - 108.05% 113.29% 102.42% 121.59% / cuab gnsa oiim] % sign. coeff. - 881.60%	CI 95% Result Robust CI 95% Result					
EB Max -0.1367 -0.9860 0.4246 -2.3220 0.3003 220 triplets 1100.94% Robust	Dvar = c_gdp Estim. Bivar Reg. EB Min EB Max EB Min EB Max Dvar = c_gdp Estim. Bivar Reg. EB Min EB Max	0.3821 Re: X = [ge Bounds - 0.0002 0.4609 0.0289 0.4735 - Re: X = Bounds - - - - - - - - - - - - -	0.2073 od pode] Coeff.β 0.2097 0.2266 0.2376 0.2148 0.2550 Sult of EBA of [pode] Coeff.β -0.0896 -0.7896 -0.7896 -0.6570	0.0874 0.0874 X = [bltrt Std. Erro. 0.0807 0.1132 0.1132 0.1132 0.1132 0.1132 0.1086 0.1093 X = [bltrt blt: Std. Erro. 0.0321 0.3215 0.2563	2.3715 nfidence leve bltry trop tr t 2.6000 2.0015 2.1285 2.3112 2.3340 nfidence leve t -2.7890 -2.4560 -2.5632	0.2540 el and maxin sp ecsp drid p-val 0.1150 0.2950 0.2796 0.2980 0.2577 el and maxin ecsp drid oes p-val 0.1235 0.4563 0.2598	220 triplets num VIF = 10 oexr fidd fiop m N. comb - 66 doubles 220 triplets 220 triplets num VIF = 10 cr fidd fiop mopy N. comb	81.54% 94.32% opy cuab gnsa] % sign. coeff. - 108.05% 113.29% 102.42% 121.59% / cuab gnsa oiim] % sign. coeff. - 881.60% 733.59%	CI 95% Result Robust CI 95% Robust CI 95% Result					
	Dvar = c_gdp Estim. Bivar Reg. EB Min EB Max EB Min EB Max Dvar = c_gdp Estim. Bivar Reg. EB Min EB Max EB Min	0.3821 Re: X = [ge Bounds - 0.0002 0.4609 0.0289 0.4735 - Re: X = Bounds - - - - - - - - - - - - -	0.2073 sult of EBA c od pode] Coeff.β 0.2097 0.2266 0.2376 0.2148 0.2550 sult of EBA c [pode] Coeff.β -0.0896 -0.7896 -0.6570 -0.7899	0.0874 0.0874 0.0874 0.0807 0.1132 0.1132 0.1132 0.1116 0.1086 0.1093 0.00321 0.0321 0.03215 0.2563 0.3199	2.3715 nfidence leve bltry trop tr t 2.6000 2.0015 2.1285 2.3112 2.3340 nfidence leve ry trop trsp trsp t -2.7890 -2.4560 -2.5632 -2.4690	0.2540 el and maxin sp ecsp drid p-val 0.1150 0.2950 0.2950 0.2980 0.2577 el and maxin ecsp drid oes p-val 0.1235 0.4563 0.2598 0.4521	220 triplets num VIF = 10 oexr fidd fiop m N. comb - 66 doubles 220 triplets num VIF = 10 cr fidd fiop mopy N. comb - 66 doubles 220 triplets	81.54% 94.32% opy cuab gnsa] % sign. coeff. - 108.05% 113.29% 102.42% 121.59% / cuab gnsa oiim] % sign. coeff. - 881.60% 733.59% 881.92%	CI 95% Result Robust CI 95% Robust					

Tables 5: Continue

Result of EBA on pode at .75 confidence level and maximum VIF = 10									
Dvar = c_gdp	X = [geod] Z = [bltrt bltry trop trsp ecsp drid oexr fidd fiop mopy cuab gnsa oiim] O						CI 95%		
Estim.	Bounds	Coeff.β	Std. Erro.	t	p-val	N. comb	% sign. coeff.	Result	
Bivar Reg.	-	1.7560	0.8184	2.1456	0.1310	-	-	-	
EB Min	-0.1721	1.4589	0.8155	1.7890	0.3356	-	83.08%	Dahuat	
EB Max	2.9284	1.4589	0.7347	1.9856	0.3265	oo doubles	83.08%	Robust	
EB Min	-0.3259	1.5621	0.9440	1.6548	0.3211	220 4-1-1-4-	88.96%	Dahuat	
EB Max	3.3540	1.5632	0.8954	1.7458	0.2986	220 triplets	89.02%	Robust	

	Re	sult of EBA of	on bltrt at .75 co	onfidence leve	el and maxin	num VIF = 10		
Dvar = c_gdp	X = [ge	od pode]	Z = [bltry	trop trsp ec:	sp drid oexr	fidd fiop mopy c	uab gnsa oiim]	CI 95%
Estim.	Bounds	Coeff.β	Std. Erro.	t	p-val	N. comb	% sign. coeff.	Result
Bivar Reg.	-	3.7576	1.6133	2.3300	0.0240	-	-	-
EB Min	0.6015	2.7080	1.0532	2.5711	0.2361	66 doublas	72.07%	Pobust
EB Max	6.0496	3.7122	1.1687	3.1764	0.1942	00 doubles	98.79%	Robust
EB Min	0.4502	2.5386	1.0442	2.4311	0.2484	220 triplata	67.56%	Dobust
EB Max	5.7711	3.4515	1.1598	2.9759	0.2064	220 triplets	91.85%	Robust
	Re	sult of EBA c	on bltry at .75 co	onfidence lev	el and maxir	num VIF = 10		
Dvar = c_gdn	$\mathbf{X} = \mathbf{f}\mathbf{g}\mathbf{e}$	od nodel	$\mathbf{Z} = [\mathbf{b}]\mathbf{trt}$	tron trsn eco	sn drid oexr	fidd fion mony c	uah onsa niim]	CI 95%
Estim	Bounds	Coeff B	Std Erro	t t	n-val	N comb	% sign_coeff	Result
Biyar Reg	Dounds	2 6133	1 1452	2 2800	0.0270	ru como	/o signi coent	itestite
EB Min	0.6122	3 4335	1.1452	2.2800	0.0270		131 30%	
ED Mini	7.6148	4 7026	1.4100	2.4540	0.1012	66 doubles	170.05%	Robust
ED Min	7.0148	4.7020	1.4501	3.2290	0.1912		1/9.93%	
ED MIII ED Mor	0.9948	3.7032	1.5552	2.7541	0.2232	220 triplets	141.78%	Robust
EB Max	8.0990	4.9340	1.5722	5.1514	0.1950	_	189.39%	
Dvar – e adn	Re X – [ge	sult of EBA (on trop at .75 co Z = [b]trt	nfidence leve	el and maxin sp. drid oevr	num VIF = 10 fidd fion mony (uah ansa aiim]	CT 95%
Dvar – C_gup	A – Lge			bitty tisp et	sp unu oexi	N		CI 7570
Estim.	Bounds	Coeff.p	Std. Erro.	t	p-val	N. comb	% sign. coeff.	Result
Bivar Reg.	-	0.4493	0.1589	2.8300	0.0070	-	-	-
EB Min	0.0568	0.3265	0.1348	2.4213	0.2493	66 doublos	72.67%	Dobust
EB Max	0.7070	0.4386	0.1342	3.2677	0.1891	oo doubles	97.62%	Robust
EB Min	0.0760	0 3236	0.1238	2.6134	0 2327		72.03%	
EB Max	0.6801	0.4176	0.1312	3 1822	0.1938	220 triplets	92.95%	Robust
LD Wax	0.0001	0.4170	0.1512	5.1022	0.1750		12.9370	
	Da	and of EDA						
Dvar – c. adn	Ke X – [ge	sult of EBA (on trsp at .75 co $\mathbf{Z} = \mathbf{D}\mathbf{I}\mathbf{r}\mathbf{r}\mathbf{I}$	nfidence leve	el and maxin	num VIF = 10 fidd fion mony (uah anca aiim]	CT 95%
Ectim	Rounds	Cooff B	Std Erro	<i>t</i>	n vol	N comb	% sign cooff	Docult
Estill.	Doulius	Coeff.p	Stu. E110.	ι 2 ο c00	p-vai	N. COIID	70 sign. coen.	Kesun
Bivar Reg.	-	-0.9105	0.2297	-3.9600	0.0000	-	-	-
EB Min	-2.6394	-1.6764	0.4815	-3.4816	0.1781	66 doubles	184.12%	Robust
EB Max	-0.1592	-0.6376	0.2392	-2.6656	0.2285	00 0000103	70.03%	Robust
EB Min	-2.4576	-1.5739	0.4419	-3.5620	0.1742	220 1 .	172.87%	D 1
EB Max	-0.1723	-0.6214	0.2245	-2.7676	0.2207	220 triplets	68.25%	Robust
	Re	sult of EBA	on ecsp at .70 co	onfidence leve	el and maxin	num VIF = 10		
Dvar = c_gdp	X = [ge	od pode]	Z = [bltrt	bltry trop tr	sp drid oexr	fidd fiop mopy c	uab gnsa oiim]	CI 95%
Estim.	Bounds	Coeff.ß	Std. Erro.	t	p-val	N. comb	% sign. coeff.	Result
Biyar Reg	-	-0.0075	0.0039	-1 9000	0 2760	-	-	-
FR Min	-0.0247	-0.0128	0.0059	-2 1534	0.2768		170 99%	
ED Mm	0.0007	0.0110	0.0056	2.1334	0.2700	66 doubles	157.620	Fragile
ED Max	-0.0007	-0.0118	0.0050	-2.1183	0.2808		157.05%	
EB Min	-0.0236	-0.0121	0.0057	-2.1128	0.2814	220 triplets	161.64%	Fragile
EB Max	-0.0005	-0.0113	0.0054	-2.0831	0.2849	, A	150.95%	U
D	Re	sult of EBA	on drid at .75 co	nfidence leve	el and maxin	num VIF = 10		CT 050/
$Dvar = c_gdp$	$\mathbf{X} = [\mathbf{g}\mathbf{e}]$	eod pode]	$\mathbf{Z} = [\mathbf{D}\mathbf{I}\mathbf{r}\mathbf{t}]$	bitry trop tr	sp ecsp drid	oexr flop mopy o	cuab gnsa onm	CI 95%
Estim.	Bounds	Coeff.β	Std. Erro.	t	p-val	N. comb	% sign. coeff.	Result
Bivar Reg.	-	-0.5469	0.4870	-1.1230	0.5213	-	-	-
EB Min	-1.5259	-0.5556	0.4852	-1.1452	0.5555	66 1. 11.	101.59%	F
EB Max	0.2452	-0.4770	0.3611	-1.3210	0.6013	oo doubles	87.22%	Fragile
EB Min	-1 4044	-0 5321	0 4361	-1 2200	0.4120		97 29%	
EB Max	0.5103	-0.6510	0.5806	-1.1212	0.3985	220 triplets	119.03%	Fragile
	Re	sult of EBA o	on oexr at .75 co	nfidence leve	el and maxin	num VIF = 10		
Dvar = c_gdn	X =	[geod pode]	$\mathbf{Z} = \mathbf{D}\mathbf{I}\mathbf{t}$	rt bltry trop	trsp ecsp dr	id fidd fion mon	v cuab gnsa oiim]	CI 95%
Estim	Bounds	Coeff R	Std. Erro	t	n_val	N comb	% sign coeff	Recult
Divor Dog	Dounus	0.0070	0 6706	1 4522	0.2150	THE COMP	70 51511 COCII.	mout
ED M:-	2 00 60	1 1256	0.0750	1 2020	0.2150	-	-	-
EB MIN	-2.9969	-1.1256	0.9357	-1.2030	0.2555	66 doubles	114.04%	Fragile
	0 0227	1 5600	1 9512	1 25/16	11/25/21		150 ()60/	

EB Max

EB Min

EB Max

0.9327

-4.0136

0.7767

-1.5699

-1.7770

-1.5460

1.2513

1.1183

1.1614

-1.2546

-1.5890

-1.3312

0.2521

0.2444

0.2216

220 triplets

Tables 6: Extreme Bound Analysis results for the Euro Area from 2000 to 2011

Fragile

159.06%

180.04%

156.64%

Tables 6: Continued

Result of EBA on fidd at .75 confidence level and maximum $VIF = 10$										
Dvar = c_gdp	X =	X = [geod pode] Z = [bltrt bltry trop trsp ecsp drid oexr fiop mopy cuab gnsa oiim]								
Estim.	Bounds	Coeff.β	Std. Erro.	t	p-val	N. comb	% sign. coeff.	Result		
Bivar Reg.	-	-1.6590	0.4769	-3.4789	0.0222	-	-	-		
EB Min	-1.7854	-1.1256	0.3299	-3.4123	0.1002	(C. Jauklas	67.85%	Daharat		
EB Max	-0.6099	-1.4477	0.4189	-3.4560	0.2002	oo doubles	87.26%	Robust		
EB Min	-2.7320	-1.6659	0.5330	-3.1253	0.1562	220 4-1-1-4-	100.42%	Dahuat		
EB Max	-0.6763	-1.7850	0.5543	-3.2200	0.1988	220 triplets	107.59%	Robust		

Result of EBA on fiop at .75 confidence level and maximum VIF = 10										
Dvar = c_gdp	X = [geod pode] $Z = [bltrt bltry trop trsp ecsp drid oexr fidd mopy cuab gnsa oiim]$						CI 95%			
Estim.	Bounds	Coeff.β	Std. Erro.	t	p-val	N. comb	% sign. coeff.	Result		
Bivar Reg.	-	0.4969	0.1918	2.5900	0.1180	-	-	-		
EB Min	0.1365	0.6890	0.2762	2.4942	0.2428	66.1.11.	138.65%	Dition		
EB Max	1.3240	0.7832	0.2704	2.8967	0.2116	oo doubles	157.60%	Robust		
EB Min	0.1214	0.6289	0.2537	2.4786	0.2441	220 4-1-1-4-	126.55%	Daharat		
EB Max	1.2200	0.6961	0.2619	2.6574	0.2291	220 triplets	140.08%	Robust		

Result of EBA on mopy at .75 confidence level and maximum VIF = 10										
Dvar = c_gdp	X =	X = [geod pode] Z = [bltrt bltry trop trsp ecsp drid oexr fidd fiop cuab gnsa oiim]								
Estim.	Bounds	Coeff.β	Std. Erro.	t	p-val	N. comb	% sign. coeff.	Result		
Bivar Reg.	-	4.9960	1.7843	2.8000	0.0450	-	-	-		
EB Min	0.2186	4.0123	1.8969	2.1152	0.1556	66 doubles	80.31%	Dobust		
EB Max	7.6586	4.2214	1.7186	2.4563	0.1111	oo doubles	84.50%	KODUSI		
EB Min	0.7634	4.2256	1.7311	2.4410	0.1256	220 triplata	84.58%	Dobust		
EB Max	9.2951	4.7780	2.2586	2.1155	0.1320	220 inplets	95.64%	Robust		

Result of EBA on cuab at .75 confidence level and maximum $VIF = 10$										
$Dvar = c_gdp$	X =	X = [geod pode] Z = [bltrt bltry trop trsp ecsp drid oexr fidd fiop mopy gnsa oiim]								
Estim.	Bounds	Coeff.β	Std. Erro.	t	p-val	N. comb	% sign. coeff.	Result		
Bivar Reg.	-	0.2646	0.0864	3.0600	0.0030	-	-	-		
EB Min	0.0487	0.1929	0.0721	2.6758	0.2277	(C daubles	72.91%	Daharat		
EB Max	0.4198	0.2641	0.0779	3.3918	0.1825	oo doubles	99.83%	KODUSI		
EB Min	0.0347	0.1784	0.0718	2.4831	0.2437	220 4-1-1-4-	67.43%	Daharat		
EB Max	0.4243	0.2681	0.0781	3.4336	0.1804	220 triplets	101.34%	KODUSI		

Result of EBA on gnsa at .75 confidence level and maximum VIF = 10										
Dvar = c_gdp	X =	X = [geod pode] Z = [bltrt bltry trop trsp ecsp drid oexr fidd fiop mopy cuab oiim]						CI 95%		
Estim.	Bounds	Coeff.β	Std. Erro.	t	p-val	N. comb	% sign. coeff.	Result		
Bivar Reg.	-	0.4430	0.1003	4.4200	0.0000	-	-	-		
EB Min	0.0939	0.3003	0.1032	2.9102	0.2107	(C. daublas	67.78%	Daharat		
EB Max	0.6391	0.4248	0.1072	3.9637	0.1573	oo doubles	95.89%	Robust		
EB Min	0.0737	0.2784	0.1023	2.7207	0.2242	220 4-1-1-4-	62.84%	Daharat		
EB Max	0.6372	0.4241	0.1066	3.9802	0.1567	220 triplets	95.73%	Robust		

Result of EBA on on at .75 confidence level and maximum $VIF = 10$										
$Dvar = c_gdp$	X =	X = [geod pode] Z = [bltrt bltry trop trsp ecsp drid oexr fidd fiop mopy cuab gnsa] (
Estim.	Bounds	Coeff.β	Std. Erro.	t	p-val	N. comb	% sign. coeff.	Result		
Bivar Reg.	-	1.7890	0.5389	3.3200	0.0552	-	-	-		
EB Min	0.5299	1.2569	0.3635	3.4580	0.0523	(C daubles	70.26%	Dahmat		
EB Max	2.9019	1.7740	0.5640	3.1456	0.0689	oo doubles	99.16%	Robust		
EB Min	0.5625	1.4599	0.4487	3.2536	0.0856	220 triplata	81.60%	Dobust		
EB Max	2.6753	1.6520	0.5116	3.2288	0.0985	220 inpiets	92.34%	Robust		

Result of EBA on geod at .75 confidence level and maximum $VIF = 10$										
Dvar = c_gdp	2	X = [geod] Z = [bltrt bltry trop trsp ecsp drid oexr fidd fiop mopy cuab gnsa oiim]								
Estim.	Bounds	Coeff.ß	Std. Erro.	t	p-val	N. comb	% sign. coeff.	Result		
Bivar Reg.	-	-2.4410	0.7838	-3.1144	0.0213	-	-	-		
EB Min	-3.0225	-1.7852	0.6187	-2.8856	0.1205	66 1. 11.	73.13%	Dili		
EB Max	-0.5533	-1.9820	0.7144	-2.7745	0.1166	66 doubles	81.20%	Robust		
EB Min	-2.8462	-1.4646	0.6908	-2.1202	0.2015	220 1 .	60.00%	D 1		
EB Max	-0.2958	-1.4778	0.5910	-2.5006	0.2217	220 triplets	60.54%	Robust		

	R	esult of EBA	on pode at .75	confidence le	Result of EBA on pode at .75 confidence level and maximum VIF = 10										
Dvar = c_gdp	Х	X = [geod]	$\mathbf{Z} = [\mathbf{b}\mathbf{l}\mathbf{t}\mathbf{r}\mathbf{t} \mathbf{b}\mathbf{l}\mathbf{t}]$	ry trop trsp	ecsp drid oe	r fidd fiop mopy	y cuab gnsa oiim]	CI 95%							
Estim.	Bounds	Coeff.ß	Std. Erro.	t	p-val	N. comb	% sign. coeff.	Result							
Bivar Reg.	-	0.2533	0.0774	3.2700	0.0020	-	-	-							
EB Min	0.0384	0.2023	0.0819	2.4691	0.2450	66 doubles	79.87%	Dobust							
EB Max	0.5106	0.3426	0.0840	4.0775	0.1531	oo doubles	135.27%	Robust							
EB Min	0.0371	0.1840	0.0734	2.5059	0.2417	220 triplata	72.65%	Dobust							
EB Max	0.5121	0.3425	0.0848	4.0398	0.1545	220 triplets	135.23%	Robust							

Tables 6: Continued

Tables 7: Extreme	Bound Analysis re	esults for the	GCC countries from	1980 to 1989
	v			

Result of EBA bltrt on at .75 confidence level and maximum VIF = 10

 Dvar = c_gdp	X =	[geod pode]	Ζ =	= [bltry trop tr	sp ecsp drid o	exr fidd fiop mop	y cuab gnsa oiex]	CI 95%	
 Estim.	Bounds	Coeff.β	Std. Erro.	t	p-val	N. comb	% sign. coeff.	Result	
Bivar Reg.	-	0.4590	0.2570	1.7859	0.2310	-	-	-	
 EB Min	-0.0030	0.4552	0.2291	1.9870	0.2998	((), 11.	99.17%	F	
 EB Max	1.2112	0.4411	0.3851	1.1455	0.2321	66 doubles	96.10%	Fragile	
 EB Min	0.0268	0.5532	0.2632	2.1020	0.2112	220 4 1 1 4	120.52%	F	
EB Max	1.3686	0.4897	0.4394	1.1144	0.2652	220 triplets	106.69%	Fragile	

Result of EBA on bltry at .75 confidence level and maximum VIF = 10

Dvar = c_gdp	X =	[geod pode]	Z =	Z = [bltrt trop trsp ecsp drid oexr fidd fiop mopy cuab gnsa oiex] Q Std. Erro. t p-val N. comb % sign. coeff. 0.5550 1.4216 0.2002 - - 0.3998 1.6490 0.2111 66 doubles 83.55% 0.3810 1.5696 0.2321 66 doubles 75.79%				
Estim.	Bounds	Coeff.β	Std. Erro.	t	p-val	N. comb	% sign. coeff.	Result
Bivar Reg.	-	0.7890	0.5550	1.4216	0.2002	-	-	-
EB Min	-0.1403	0.6592	0.3998	1.6490	0.2111	(C. daublas	83.55%	E
EB Max	1.3600	0.5980	0.3810	1.5696	0.2321	oo doubles	75.79%	Fragile
EB Min	-0.1813	0.4886	0.3349	1.4587	0.1985	220 triplata	61.92%	Erogilo
EB Max	1.3983	0.6520	0.3731	1.7474	0.2020	220 inplets	82.64%	riagne

Result of EBA on trop at .45 confidence level and maximum $\ensuremath{VIF}=10$

$Dvar = c_{-}$	gdp	X =	[geod pode]	Z	= [bltrt bltry trs	sp ecsp drid o	exr fidd fiop mop	y cuab gnsa oiex]	CI 95%
Es	im. l	Bounds	Coeff.β	Std. Erro.	t	p-val	N. comb	% sign. coeff.	Result
Bivar I	leg.	-	-0.4549	0.1803	2.5200	0.0250	-	-	-
EB	Min -	-0.0371	-0.4376	0.2373	1.8437	0.3164	66 doubles	96.21%	Fragile
EB N	lax	0.9097	-0.3775	0.2661	1.4186	0.3909		82.99%	
EB	Min -	-0.1630	-0.3890	0.2760	1.4095	0.3928	220	85.52%	F
EB N	lax	0.9410	-0.3890	0.2760	1.4095	0.3928	220 triplets	85.52%	Fragile

Result of EBA on trsp at .75 confidence level and maximum VIF = 10

$Dvar = c_{\pm}$	gdp X	= [geod pode]	Z	= [bltrt bltry tr	op ecsp drid	oexr fidd fiop moj	oy cuab gnsa oiex]	CI 95%
Est	im. Bounds	Coeff.β	Std. Erro.	t	p-val	N. comb	% sign. coeff.	Result
Bivar F	eg	-0.9860	0.4966	-1.9856	0.1122	-	-	-
EB N	/lin -1.5323	-0.7895	0.3714	-2.1256	0.2589	66 doublos	80.07%	Eragila
EB N	fax -0.0423	-0.4589	0.2083	-2.2032	0.2559	oo doubles	46.54%	Fragile
EB N	/lin -1.2791	-0.6590	0.3100	-2.1256	0.2333	220 trialate	66.84%	E-mails
EB N	lax -0.0263	-0.4455	0.2096	-2.1256	0.2005	220 thplets	45.18%	Fragile

Result of EBA on ecsp at .55 confidence level and maximum VIF = 10

Dvar = c_gdp	X =	[geod pode]	Z =	= [bltrt bltry tr	op trsp drid o	exr fidd fiop mop	y cuab gnsa oiex]	CI 95%
Estim.	Bounds	Coeff.β	Std. Erro.	t	p-val	N. comb	% sign. coeff.	Result
Bivar Reg.	-	0.0202	0.0145	1.3900	0.1880	-	-	-
EB Min	-0.0145	0.0225	0.0185	1.2155	0.4383	66 doubles	111.55%	Fragile
EB Max	0.0656	0.0251	0.0203	1.2391	0.4323	00 doubles	124.44%	
EB Min	-0.0077	0.0123	0.0100	1.2271	0.4353	220 4 1 1 4	60.98%	T
EB Max	0.0557	0.0240	0.0159	1.5120	0.3720	220 triplets	118.98%	rragile

Result of EBA on drid at .70 confidence level and maximum VIF = 10

$Dvar = c_gdp$	X =	[geod pode]	Z =	= [bltrt bltry tro	op trsp ecsp o	exr fidd fiop mop	y cuab gnsa oiex]	CI 95%
Estim.	Bounds	Coeff.β	Std. Erro.	t	p-val	N. comb	% sign. coeff.	Result
Bivar Reg.	-	0.1098	0.0669	1.6400	0.1240	-	-	-
EB Min	0.0039	0.1389	0.0675	2.0578	0.2880	(C. daublas	126.45%	Fragile
EB Max	0.3022	0.1761	0.0630	2.7933	0.2189	oo doubles	160.31%	
EB Min	0.0000	0.1450	0.0725	1.9999	0.2952	220 triplata	132.00%	Erogila
EB Max	0.3027	0.1652	0.0688	2.4025	0.2511	220 triplets	150.39%	Flagile

Tables 7: Continued

$Dvar = c_gdp$	Х	= [geod pode]	Z =	[bltrt bltry tro	p trsp ecsp d	rid fidd fiop mop	y cuab gnsa oiex]	CI 95%
Estim.	Bounds	Coeff.β	Std. Erro.	t	p-val	N. comb	% sign. coeff.	Result
Bivar Reg.	-	-17.3547	5.6468	-3.0700	0.0090	-	-	-
EB Min	-33.2914	-15.1702	9.0606	-1.6743	0.3428	<i>((</i> 1, 11))	87.41%	E
 EB Max	2.4563	-12.8764	7.6663	-1.6796	0.3419	66 doubles	74.20%	Fragile
EB Min	-33.0301	-15.8533	8.5884	-1.8459	0.3161	220 1	91.35%	E
EB Max	2.5163	-13.4400	7.9782	-1.6846	0.3410	220 triplets	77.44%	Fragile

Result of EBA on oexr at .65 confidence level and maximum VIF = 10

Result of EBA on fidd at .75 confidence level and maximum VIF = 10

 $Dvar = c_gdp$	X =	[geod pode]	Z	= [bltrt bltry tro	CI 95%			
 Estim.	Bounds	Coeff.β	Std. Erro.	t	p-val	N. comb	% sign. coeff.	Result
 Bivar Reg.	-	-1.8790	0.9463	-1.9856	0.1220	-	-	-
 EB Min	-3.0966	-1.5566	0.7700	-2.0215	0.2125	(C. daublas	82.84%	Energi1e
 EB Max	-0.0838	-1.4459	0.6811	-2.1230	0.2560	66 doubles	76.95%	Fragile
 EB Min	-3.3079	-1.6590	0.8244	-2.0123	0.3333	220 triplata	88.29%	Erragila
EB Max	-0.0753	-1.4440	0.6844	-2.1100	0.3102	220 triplets	76.85%	Flaghe

Result of EBA on fiop at .75 confidence level and maximum $\mathrm{VIF}=10$

Dvar = c_gdp	X =	[geod pode] =	Z :	= [bltrt bltry tr	op trsp ecsp	drid oexr fidd mop	y cuab gnsa oiex]	CI 95%
Estim.	Bounds	Coeff.β	Std. Erro.	t	p-val	N. comb	% sign. coeff.	Result
Bivar Reg.	-	0.2560	0.1755	1.4589	0.3410	-	-	-
EB Min	-0.1095	0.2156	0.1625	1.3265	0.2835	66 doubles	84.22%	Fragile
EB Max	0.6559	0.2330	0.2114	1.1020	0.2620		91.02%	
EB Min	-0.0921	0.1450	0.1186	1.2230	0.2111	220 1	56.64%	P
EB Max	0.6191	0.2230	0.1980	1.1260	0.2356	220 triplets	87.11%	Fragile

Result of EBA on mopy at .75 confidence level and maximum $\ensuremath{VIF}=10$

$Dvar = c_{-}$	gdp	X = [geod p]	oode]	Z = [bltrt bltr	y trop trsp ec	sp drid oexr fidd i	fiop cuab gnsa oiex]	CI 95%
Es	tim. Bou	nds Coe	ff.β Std. Err	ro. t	p-val	N. comb	% sign. coeff.	Result
Bivar	Reg	0.88	893 0.4610) 1.9300	0.0760	-	-	-
EB	Min 0.49	909 1.68	827 0.5959	2.8239	0.2167	66 doubles	189.22%	Fragile
EB	/lax 2.58	807 1.42	0.5767	2.4753	0.2444		160.51%	
EB	Min 0.72	262 1.88	899 0.5818	3.2481	0.1901	220 + 1 - 1 - + -	212.52%	F
EB	Max 2.4	182 1.33	371 0.5405	5 2.4737	0.2446	220 triplets	150.36%	Fragile

Result of EBA on cuab at .70 confidence level and maximum VIF = 10

Dvar = c_gdp	X =	[geod pode]	Z =	mopy gnsa oiex]	CI 95%			
Estim.	Bounds	Coeff.β	Std. Erro.	t	p-val	N. comb	% sign. coeff.	Result
Bivar Reg.	-	2.7901	0.7609	3.6700	0.0030	-	-	-
EB Min	0.7328	4.1263	1.6967	2.4319	0.2484	66 doubles	147.89%	Robust
EB Max	11.5432	5.8957	2.8237	2.0879	0.2844	00 doubles	211.30%	
EB Min	0.4501	4.0786	1.8142	2.2481	0.2664	220	146.18%	D.I. v
EB Max	11.4509	6.0949	2.6780	2.2759	0.2636	220 triplets	218.44%	KODUSI

Result of EBA on gnsa at .65 confidence level and maximum VIF = 10

$Dvar = c_gdp$	X =	[geod pode]	Z =	[bltrt bltry tr	op trsp ecsp	drid oexr fidd fiop	mopy cuab oiex]	CI 95%
Estim.	Bounds	Coeff.β	Std. Erro.	t	p-val	N. comb	% sign. coeff.	Result
Bivar Reg.	-	2.0805	0.7385	2.8200	0.0150	-	-	-
EB Min	-0.1501	0.9840	0.5670	1.7353	0.3328	66 doublas	47.30%	Erogila
EB Max	3.8449	1.8487	0.9981	1.8522	0.3152	oo doubles	88.86%	Fragile
EB Min	-0.1231	0.9979	0.5605	1.7804	0.3258	220 4	47.96%	Ensaile
EB Max	3.7458	1.7138	1.0160	1.6868	0.3407	220 triplets	82.37%	Fragile

Tables 7: Continued

	$Dvar = c_gdp$	X =	[geod pode]	Z =	Z = [bltrt bltry trop trsp ecsp drid oexr fidd fiop mopy cuab gnsa						
	Estim.	Bounds	Coeff.β	Std. Erro.	t	p-val	N. comb	% sign. coeff.	Result		
	Bivar Reg.	-	3.0836	0.3803	8.1100	0.0000	-	-	-		
	EB Min	1.0492	2.4149	0.6828	3.5366	0.1754	((), 11.	78.31%	Robust		
	EB Max	4.2350	2.9820	0.6265	4.7598	0.1318	66 doubles	96.71%			
	EB Min	0.9056	2.3425	0.7184	3.2606	0.1894	220 4 1 1 4	75.97%	Data		
	EB Max	4.2579	2.9591	0.6494	4.5565	0.1375	220 triplets	95.96%	Robust		

Result of EBA on oiex at .75 confidence level and maximum VIF = 10

Result of EBA on good at .75 confidence level and maximum $\mathrm{VIF}=10$

$Dvar = c_gdp$		X = [pode]	Z = [bltrt b	oltry trop trsp	ecsp drid oe	exr fidd fiop mop	y cuab gnsa oiex]	CI 95%
Estim.	Bounds	Coeff.β	Std. Erro.	t	p-val	N. comb	% sign. coeff.	Result
Bivar Reg.	-	-0.0014	0.0003	-4.6700	0.0000	-	-	-
EB Min	-139.7827	-58.1530	40.8149	-1.4248	0.3896	(C. daubles	4121987.52%	Ensails
EB Max	35.4566	-54.6263	45.0415	-1.2128	0.4390	oo doubles	3872008.79%	Fragile
EB Min	-141.0095	-52.6992	44.1552	-1.1935	0.4440	220 triplata	3735412.53%	Erogila
EB Max	30.4519	-46.6123	38.5321	-1.2097	0.4398	220 inplets	3303962.29%	Fragile

Result of EBA on pode at .75 confidence level and maximum $VIF = 10$	Result of EBA	on pode at .75	confidence level	l and maximum	VIF = 10
--	---------------	----------------	------------------	---------------	-----------------

$Dvar = c_gdp$		X = [geod] $Z = [bltrt bltry trop trsp ecsp drid oexr fidd fiop mopy cuab gnsa oiex] ($						CI 95%
Estim.	Bounds	Coeff.β	Std. Erro.	t	p-val	N. comb	% sign. coeff.	Result
Bivar Reg.	-	0.7890	0.3209	2.4589	0.1250	-	-	-
EB Min	-0.3973	0.9860	0.6916	1.4256	0.1586	66 daublas	124.97%	Emails
EB Max	2.5993	0.9876	0.8058	1.2256	0.1788	oo doubles	125.17%	Fragile
EB Min	-0.4006	0.7890	0.5948	1.3265	0.2023	220 1.	100.00%	E
EB Max	2.0295	0.8890	0.5702	1.5590	0.2005	220 triplets	112.67%	Fragile

Tables 8: Extreme Bound Analysis results for the GCC countries from 1990 to 1999

Result of EBA on bltrt at .75 confidence level and maximum $VIF = I$
--

 $Dvar = c_gdp$	X =	[geod pode]	Z =	= [bltry trop trs	sp ecsp drid o	exr fidd fiop mop	y cuab gnsa oiex]	CI 95%
 Estim.	Bounds	Coeff.β	Std. Erro.	t	p-val	N. comb	% sign. coeff.	Result
 Bivar Reg.	-	1.1110	0.6214	1.7880	0.2310	-	-	-
EB Min	-0.3807	1.0263	0.7035	1.4589	0.2025	<i>((</i> 1, 11))	92.38%	E
 EB Max	2.4841	1.0555	0.7143	1.4777	0.2255	66 doubles	95.00%	Fragile
EB Min	-0.4692	0.9870	0.7281	1.3556	0.2231	220 1	88.84%	E
EB Max	2.2226	0.8890	0.6668	1.3332	0.2500	220 triplets	80.02%	Fragile

Result of EBA on bltry at .75 confidence level and maximum VIF = 10

Dvar = c_gdp	X =	[geod pode]	Z =	= [bltrt trop tr	sp ecsp drid o	exr fidd fiop mop	y cuab gnsa oiex]	CI 95%
Estim.	Bounds	Coeff.β	Std. Erro.	t	p-val	N. comb	% sign. coeff.	Result
Bivar Reg.	-	1.0145	0.5968	1.6998	0.3310	-	-	-
EB Min	-0.5162	1.0147	0.7655	1.3256	0.3214	(C. daublas	100.02%	E
EB Max	2.6493	1.1145	0.7674	1.4523	0.3251	oo doubles	109.86%	Fragile
EB Min	-0.8177	1.0250	0.9213	1.1125	0.3311	220 triplata	101.03%	Erogilo
EB Max	2.5985	1.0012	0.7987	1.2536	0.3012	220 inplets	98.69%	riagne

Result of EBA on trop at .75 confidence level and maximum $\ensuremath{VIF}=10$

 $Dvar = c_gdp$	X =	[geod pode]	Z =	Z = [bltrt bltry trsp ecsp drid oexr fidd fiop mopy cuab gnsa oiex]					
 Estim.	Bounds	Coeff.β	Std. Erro.	t	p-val	N. comb	% sign. coeff.	Result	
Bivar Reg.	-	2.1250	1.2204	1.7412	0.2150	-	-	-	
EB Min	-0.7091	2.0125	1.3608	1.4789	0.3325	(C. Jaublas	94.71%	E-maile	
EB Max	5.6060	2.4530	1.5765	1.5560	0.3005	oo doubles	115.44%	Fragile	
 EB Min	-0.8744	2.1140	1.4942	1.4148	0.3002	220 1 .	99.48%	E	
EB Max	5.0025	2.1250	1.4387	1.4770	0.3102	220 triplets	100.00%	Fragile	

Result of EBA on trsp at .75 confidence level and maximum VIF = 10

$Dvar = c_gdp$	X =	[geod pode]	Z	= [bltrt bltry tro	p ecsp drid o	exr fidd fiop mop	y cuab gnsa oiex]	CI 95%
Estim.	Bounds	Coeff.β	Std. Erro.	t	p-val	N. comb	% sign. coeff.	Result
Bivar Reg.	-	-1.1616	0.4133	-2.8100	0.0940	-	-	-
EB Min	-2.5463	-1.6408	0.4527	-3.6241	0.1714	((daublaa	141.25%	Dahaat
 EB Max	-0.5319	-1.4020	0.4351	-3.2225	0.1916	oodoubles	120.69%	Robust
EB Min	-2.5928	-1.6400	0.4764	-3.4424	0.1800	220 trialata	141.18%	Debust
 EB Max	-0.5137	-1.4186	0.4525	-3.1353	0.1966	220 triplets	122.12%	KODUST

Result of EBA on escp at .75 confidence level and maximum VIF = 10

 $Dvar = c_gdp$	X =	[geod pode]	Z =	Z = [bltrt bltry trop trsp drid oexr fidd fiop mopy cuab gnsa oiex]				
Estim.	Bounds	Coeff.β	Std. Erro.	t	p-val	N. comb	% sign. coeff.	Result
 Bivar Reg.	-	0.7890	0.5460	1.4450	0.1310	-	-	-
EB Min	-0.5744	0.8890	0.7317	1.2150	0.2355	66 doubles	112.67%	Fragila
 EB Max	2.3023	0.8745	0.7139	1.2250	0.2256	00 doubles	110.84%	Fragile
EB Min	-0.2817	0.4458	0.3638	1.2255	0.2225	220	56.50%	F
EB Max	1.2263	0.4889	0.3687	1.3260	0.2215	220 triplets	61.96%	Fragile

Result of EBA on drid at .45 confidence level and maximum VIF = 10

Dvar	= c_gdp	X =	= [geod pode]	Z	= [bltrt bltry tro	op trsp ecsp c	exr fidd fiop mop	y cuab gnsa oiex]	CI 95%
	Estim.	Bounds	Coeff.β	Std. Erro.	t	p-val	N. comb	% sign. coeff.	Result
B	ivar Reg.	-	0.1939	0.1392	1.3900	0.1870	-	-	-
	EB Min	-0.5491	-0.1716	0.1888	-0.9091	0.5303	(C. daublas	-88.51%	Enseile
	EB Max	0.1566	-0.1264	0.1415	-0.8934	0.5358	oo doubles	-65.20%	Fragile
	EB Min	-0.5866	-0.2004	0.1931	-1.0379	0.4882	220 4	-103.36%	Enseile
	EB Max	0.1549	-0.1381	0.1465	-0.9427	0.5188	220 triplets	-71.23%	Fragile

Tables 8: Extreme Bound Analysis results for the GCC countries from 1990 to 1999

		Reput of LDH on	00AI 40170 00	minucinee ieve	a una masi	mum (m = 10)		
 $Dvar = c_gdp$	Х	= [geod pode]	Z = [bltrt bltry trop	trsp ecsp di	rid fidd fiop mop	y cuab gnsa oiex]	CI 95%
Estim.	Bounds	Coeff.β	Std. Erro.	t	p-val	N. comb	% sign. coeff.	Result
Bivar Reg.	-	-3.4500	1.2500	-2.7600	0.0160	-	-	-
 EB Min	-6.7267	-3.4470	1.6399	-2.1020	0.0256	<i>((</i> 1, 11))	99.91%	E
 EB Max	-0.1437	-3.0125	1.4344	-2.1002	0.0320	66 doubles	87.32%	Fragile
EB Min	-7.2963	-3.4450	1.9257	-1.7890	0.0443	220 + 1 +	99.86%	F11
EB Max	0 4089	-3 4580	1 9335	-1 7885	0.0215	220 triplets	100 23%	Fragile

Result of EBA on oexr at .75 confidence level and maximum VIF = 10

Result of EBA on fidd at .45 confidence level and maximum VIF = 10

Dvar = c_gdp	X =	[geod pode]	Z	= [bltrt bltry tro	op trsp ecsp d	lrid oexr fiop mop	y cuab gnsa oiex]	CI 95%
Estim.	Bounds	Coeff.β	Std. Erro.	t	p-val	N. comb	% sign. coeff.	Result
Bivar Reg.	-	-0.0156	0.0054	-2.8700	0.0130	-	-	-
EB Min	-0.0336	-0.0110	0.0113	-0.9725	0.5089	(C. daublas	70.42%	E
EB Max	0.0127	-0.0100	0.0113	-0.8815	0.5400	oo doubles	64.01%	Fragile
EB Min	-0.0358	-0.0127	0.0115	-1.1007	0.4695	220 triplata	81.30%	Erogila
EB Max	0.0104	-0.0127	0.0115	-1.1007	0.4695	220 unpiets	81.30%	riagile

Result of EBA on fiop at .75 confidence level and maximum VIF = 10

 $Dvar = c_gdp$	X = [geod pode]		Z =	Z = [bltrt bltry trop trsp ecsp drid oexr fidd mopy cuab gnsa oiex]					
 Estim.	Bounds	Coeff.β	Std. Erro.	t	p-val	N. comb	% sign. coeff.	Result	
Bivar Reg.	-	1.0450	0.5841	1.7890	0.0440	-	-	-	
EB Min	-0.2075	1.0125	0.6100	1.6598	0.0525	(C. daubles	96.89%	E-maile	
EB Max	2.4529	1.1230	0.6649	1.6889	0.0320	66 doubles	107.46%	Fragile	
 EB Min	-0.2875	0.9870	0.6372	1.5489	0.0562	220	94.45%	E	
EB Max	2.0831	0.8890	0.5970	1.4890	0.0555	220 triplets	85.07%	Fragile	

Result of EBA on mopy at .45 confidence level and maximum VIF = 10

$Dvar = c_gdp$	X = [geod pode]		Z	Z = [bltrt bltry trop trsp ecsp drid oexr fidd fiop cuab gnsa oiex]				
Estim.	Bounds	Coeff.β	Std. Erro.	t	p-val	N. comb	% sign. coeff.	Result
Bivar Reg.	-	0.6482	0.3484	1.8600	0.0860	-	-	-
EB Min	-0.3349	0.2519	0.2934	0.8586	0.5483	(C. daublas	38.86%	Fragile
EB Max	0.8587	0.2888	0.2850	1.0135	0.4957	oo doubles	44.56%	
EB Min	-0.3096	0.2874	0.2985	0.9628	0.5121	220	44.34%	E
EB Max	1.0163	0.3172	0.3496	0.9074	0.5309	220 triplets	48.94%	Fragile

Result of EBA on cuab at .75 confidence level and maximum VIF = 10

 $Dvar = c_gdp$	X = [geod pode]		Z = [bltrt bltry trop trsp ecsp drid oexr fidd fiop mopy gnsa oiex]					
Estim.	Bounds	Coeff.β	Std. Erro.	t	p-val	N. comb	% sign. coeff.	Result
Bivar Reg.	-	2.3260	1.1703	1.9875	0.1222	-	-	-
EB Min	0.1138	2.1450	1.0156	2.1120	0.1458	66 doubles	92.22%	Fragile
 EB Max	4.2757	2.1445	1.0656	2.0125	0.1524		92.20%	
EB Min	0.0128	2.1000	1.0436	2.0123	0.1659	220 4 1 1 4	90.28%	F
EB Max	4.0765	2.0445	1.0160	2.0123	0.1644	220 triplets	87.90%	Fragile

Result of EBA on gnsa at .55 confidence level and maximum VIF = 10

$Dvar = c_gdp$	Χ =	= [geod pode]	Z	Z = [bltrt bltry trop trsp ecsp drid oexr fidd fiop mopy cuab oiex]				
Estim.	Bounds	Coeff.β	Std. Erro.	t	p-val	N. comb	% sign. coeff.	Result
Bivar Reg.	-	-0.3724	0.2002	-1.8600	0.0860	-	-	-
EB Min	-0.9289	-0.3436	0.2926	-1.1741	0.4491	(C. daublas	92.26%	Fragile
 EB Max	0.1483	-0.2491	0.1987	-1.2536	0.4287	66 doubles	66.89%	
EB Min	-0.6711	-0.2505	0.2103	-1.1911	0.4446	220 4-1-1-4-	67.26%	Emails
EB Max	0.1701	-0.2505	0.2103	-1.1911	0.4446	220 triplets	67.26%	Fragile

Tables 8: Continued

$Dvar = c_gdp$	X =	[geod pode]	Z =	= [bltrt bltry trop trsp ecsp drid oexr fidd fiop mopy cuab gnsa]				
Estim.	Bounds	Coeff.β	Std. Erro.	t	p-val	N. comb	% sign. coeff.	Result
Bivar Reg.	-	2.7850	0.7356	3.7859	0.0091	-	-	-
EB Min	1.0360	2.4590	0.7115	3.4560	0.1023	<i>((</i> 1, 11))	88.29%	Robust
 EB Max	4.0061	2.5656	0.7203	3.5620	0.1125	66 doubles	92.12%	
EB Min	0.7724	2.1456	0.6866	3.1250	0.1002	220	77.04%	D.1.4
EB Max	3.3059	2.0126	0.6466	3.1123	0.1012	220 triplets	72.26%	Robust

Result of EBA on oiex at .75 confidence level and maximum VIF = 10

Result of EBA on good at .75 confidence level and maximum $\mathrm{VIF}=10$

$Dvar = c_gdp$		X = [pode]	Z = [bltrt bltry trop trsp ecsp drid oexr fidd fiop mopy cuab gnsa oiex]					
Estim.	Bounds	Coeff.β	Std. Erro.	t	p-val	N. comb	% sign. coeff.	Result
Bivar Reg.	-	-0.2118	0.0886	-2.3900	0.1880	-	-	-
EB Min	-0.7450	-0.4171	0.1639	-2.5442	0.2384	66 doublas	196.96%	Dobust
EB Max	-0.1004	-0.3054	0.1025	-2.9789	0.2979	66 doubles	144.21%	Robust
EB Min	-0.7628	-0.4307	0.1661	-2.5936	0.2343	220 4	203.38%	Dahaat
EB Max	-0.1035	-0.3178	0.1072	-2.9653	0.2996	220 triplets	150.07%	Robust

$Dvar = c_gdp$		X = [geod]	Z = [bltrt bltry trop trsp ecsp drid oexr fidd fiop mopy cuab gnsa oiex]					
Estim.	Bounds	Coeff.β	Std. Erro.	t	p-val	N. comb	% sign. coeff.	Result
Bivar Reg.	-	0.3775	0.1614	2.3400	0.0360	-	-	-
EB Min	0.0930	0.3662	0.1366	2.6813	0.2273	66 doubles	97.01%	Dobust
EB Max	0.7145	0.4627	0.1259	3.6749	0.1691	oo doubles	122.58%	KODUSI
EB Min	0.1616	0.3925	0.1154	3.4002	0.1821	220 1.	103.98%	D.L.
EB Max	0.6892	0.4697	0.1097	4.2806	0.1461	220 triplets	124.43%	Kobust

Tables 9: Extreme Bound Analysis results for the GCC countries from 2000 to 2011

	$Dvar = c_gdp$	Х	X = [geod pode] Z = [bltry trop trsp ecsp drid oexr fidd fiop mopy cuab gnsa oiex]							
	Estim.	Bounds	Coeff.β	Std. Erro.	t	p-val	N. comb	% sign. coeff.	Result	
	Bivar Reg.	-	5.3260	2.1686	2.4560	0.0789	-	-	-	
	EB Min	-1.5930	4.2635	2.9282	1.4560	0.1125	66 1. 11.	80.05%	E	
	EB Max	10.1588	4.4580	2.8504	1.5640	0.1570	66 doubles	83.70%	Fragile	
	EB Min	-1.5846	4.1155	2.8501	1.4440	0.1985	220 4 1 1 4	77.27%	E	
	EB Max	10.9688	4.2256	3.3716	1.2533	0.2215	220 triplets	79.34%	Fragile	

Result of EBA on bltrt at .75 confidence level and maximum VIF = 10

Result of EBA on bltry at .75 confidence level and maximum VIF = 10

$Dvar = c_gdp$	X = [geod pode]		Z =	Z = [bltrt trop trsp ecsp drid oexr fidd fiop mopy cuab gnsa oiex]					
Estim.	Bounds	Coeff.β	Std. Erro.	t	p-val	N. comb	% sign. coeff.	Result	
Bivar Reg.	-	1.7890	1.2262	1.4590	0.2310	-	-	-	
EB Min	-0.7517	1.4789	1.1153	1.3260	0.3335	((daubles	82.67%	E-maile	
EB Max	4.0544	1.5640	1.2452	1.2560	0.3320	oo doubles	87.42%	Fragile	
EB Min	-1.1627	1.4560	1.3094	1.1120	0.3453	220 trialata	81.39%	Ens ails	
EB Max	4.0864	1.5493	1.2686	1.2213	0.3655	220 unpiets	86.60%	Fragile	

Result of EBA on trop at .75 confidence level and maximum $\ensuremath{VIF}=10$

$Dvar = c_gdp$	X = [geod pode]		Z =	= [bltrt bltry trsp ecsp drid oexr fidd fiop mopy cuab gnsa oiex]					
Estim.	Bounds	Coeff.β	Std. Erro.	t	p-val	N. comb	% sign. coeff.	Result	
Bivar Reg.	-	2.0125	1.1249	1.7890	0.2215	-	-	-	
EB Min	-0.4722	1.6590	1.0656	1.5569	0.2535	(C. Jaublas	82.43%	E-maile	
EB Max	3.3334	1.4589	0.9372	1.5566	0.2320	oo doubles	72.49%	Fragile	
 EB Min	-0.5389	1.4456	0.9922	1.4569	0.2552	220	71.83%	E	
EB Max	3.1613	1.3260	0.9176	1.4450	0.2326	220 triplets	65.89%	Fragile	

Result of EBA on trsp at .75 confidence level and maximum VIF = 10

$Dvar = c_gdp$	Х	= [geod pode]	Z = [b]	trt bltry trop e	csp drid oex	r fidd fiop mop	/ cuab gnsa oiex]	CI 95%
Estim.	Bounds	Coeff.β	Std. Erro.	t	p-val	N. comb	% sign. coeff.	Result
Bivar Reg.	-	0.6814	0.6275	1.0900	0.2970	-	-	-
EB Min	-2.4260	-1.5483	0.4389	-3.5279	0.1758	((developed	-227.22%	E
EB Max	-0.6706	-1.5483	0.4389	-3.5279	0.1758	obdoubles	-227.22%	Fragile
EB Min	-2.5125	-1.5490	0.4818	-3.2153	0.2443	220 1	-738.67%	F
EB Max	-0.6693	-1.5478	0.4393	-3.5236	0.2215	220 triplets	-738.10%	Fragile

Result of EBA on escp at .45 confidence level and maximum VIF = 10

Dvar = c_gdp	Х	= [geod pode]	Z = [b	oltrt bltry trop t	rsp drid oex	r fidd fiop mop	y cuab gnsa oiex]	CI 95%
Estim.	Bounds	Coeff.β	Std. Erro.	t	p-val	N. comb	% sign. coeff.	Result
Bivar Reg.	-	-0.7092	0.4544	-1.5600	0.1430	-	-	-
EB Min	-0.1648	0.1944	0.1796	1.0823	0.4749	66doubles	-27.41%	Fragile
EB Max	0.5536	0.1944	0.1796	1.0823	0.4749	oououbles	-27.41%	
EB Min	-0.1668	0.1982	0.1825	1.0859	0.2443	220 1 .	94.52%	E
EB Max	0.5552	0.1952	0.1800	1.0845	0.2215	220 triplets	93.09%	Fragile

Result of EBA on drid at .75 confidence level and maximum $\mathbf{VIF}=\mathbf{10}$

$Dvar = c_gdp$	X =	[geod pode]	Z =	[bltrt bltry tro	op trsp ecsp c	exr fidd fiop mop	y cuab gnsa oiex]	CI 95%
Estim.	Bounds	Coeff.β	Std. Erro.	t	p-val	N. comb	% sign. coeff.	Result
Bivar Reg.	-	0.7489	0.4550	1.6459	0.2310	-	-	-
EB Min	-0.1874	0.6540	0.4207	1.5546	0.3256	(C. daublas	87.33%	Enseile
EB Max	1.3409	0.5649	0.3880	1.4560	0.3366	oo doubles	75.43%	Fragile
EB Min	-0.2837	0.4589	0.3713	1.2360	0.4425	220 tori mlata	61.28%	Enseile
EB Max	1.3613	0.5146	0.4233	1.2156	0.4215	220 triplets	68.71%	Fragile

Tables 9: Continued

Result of EDT of ocal at the confidence fever and maximum vir = 10											
	Dvar = c_gdp	X =	[geod pode]	Z =	= [bltrt bltry tr	op trsp ecsp	drid fidd fiop mop	y cuab gnsa oiex]	CI 95%		
	Estim.	Bounds	Coeff.β	Std. Erro.	t	p-val	N. comb	% sign. coeff.	Result		
	Bivar Reg.	-	-0.2130	0.0866	-2.4589	0.1250	-	-	-		
	EB Min	-0.5064	-0.2136	0.1464	-1.4589	0.2055	<i>((</i> 1, 11))	100.28%	E		
	EB Max	0.0801	-0.2156	0.1479	-1.4580	0.2050	66 doubles	101.22%	Fragile		
	EB Min	-0.8507	-0.3250	0.2628	-1.2365	0.2254	220 1 .	152.58%	F		
	EB Max	0.1422	-0.3526	0.2474	-1.4253	0.2258	220 triplets	165.54%	Fragile		

Result of EBA on oexr at .75 confidence level and maximum VIF = 10

Result of EBA on fidd at .75 confidence level and maximum VIF = 10

$Dvar = c_gdp$	X =	[geod pode]	Z	= [bltrt bltry trop trsp ecsp drid oexr fiop mopy cuab gnsa oiex]				
Estim.	Bounds	Coeff.β	Std. Erro.	t	p-val	N. comb	% sign. coeff.	Result
Bivar Reg.	-	-1.1256	0.5665	-1.9870	0.1510	-	-	-
EB Min	-2.5095	-1.2563	0.6266	-2.0050	0.2563	66 doubles	111.61%	Fragile
EB Max	-0.0760	-1.1256	0.5248	-2.1448	0.2320		100.00%	
EB Min	-2.4549	-1.2230	0.6159	-1.9856	0.2522	220 4	108.65%	Enseile
EB Max	-0.0075	-1.2256	0.6091	-2.0123	0.2551	220 triplets	108.88%	Fragile

Result of EBA on fiop at .75 confidence level and maximum VIF = 10

$Dvar = c_gdp$	X =	X = [geod pode]		2 = [bltrt bltry trop trsp ecsp drid oexr fidd mopy cuab gnsa oiex]				
Estim.	Bounds	Coeff.β	Std. Erro.	t	p-val	N. comb	% sign. coeff.	Result
Bivar Reg.	-	0.7890	0.4244	1.8590	0.0250	-	-	-
EB Min	-0.3285	0.8856	0.6070	1.4589	0.1256	66 doubles	112.24%	Fragile
EB Max	1.8811	0.7893	0.5459	1.4458	0.1525		100.04%	
EB Min	-0.2174	0.5698	0.3936	1.4477	0.2056	220 trialata	72.22%	Enseile
EB Max	1.3897	0.5698	0.4100	1.3899	0.2110	220 triplets	72.22%	Fragile

Result of EBA on mopy at .75 confidence level and maximum VIF = 10

$Dvar = c_gdp$	X =	X = [geod pode]		Z = [bltrt bltry trop trsp ecsp drid oexr fidd fiop cuab gnsa oiex]					
Estim.	Bounds	Coeff.β	Std. Erro.	t	p-val	N. comb	% sign. coeff.	Result	
Bivar Reg.	-	1.1250	0.5660	1.9876	0.0420	-	-	-	
EB Min	0.0076	1.2250	0.6087	2.0125	0.3256	66 doubles	108.89%	Fragile	
EB Max	2.4348	1.2130	0.6109	1.9856	0.2785	oo doubles	107.82%		
EB Min	0.0068	1.2214	0.6073	2.0112	0.2985	220 triplata	108.57%	Erogila	
EB Max	2.4384	1.2230	0.6077	2.0125	0.2858	220 inplets	108.71%	riagile	

Result of EBA on cuab at .75 confidence level and maximum $\mathrm{VIF}=10$

Dvar	= c_gdp	X = [geod pode]		Z = [bltrt bltry trop trsp ecsp drid oexr fidd fiop mopy gnsa oiex]					
	Estim.	Bounds	Coeff.β	Std. Erro.	t	p-val	N. comb	% sign. coeff.	Result
Bi	var Reg.	-	3.2130	1.6402	1.9590	0.2105	-	-	-
	EB Min	0.0016	3.1253	1.5619	2.0010	0.4012	66 doubles	97.27%	Erogila
	EB Max	6.2084	3.1120	1.5482	2.0101	0.3025	66 doubles	96.86%	Fragile
	EB Min	0.0032	3.2215	1.6091	2.0020	0.2258	220 trialata	100.26%	E
_	EB Max	6.8276	3.4125	1.7075	1.9985	0.2215	220 triplets	106.21%	Fragile

Result of EBA on gnsa at .75 confidence level and maximum VIF = 10

$Dvar = c_gdp$	X = [geod pode] Z			= [bltrt bltry trop trsp ecsp drid oexr fidd fiop mopy cuab oiex]				
Estim.	Bounds	Coeff.β	Std. Erro.	t	p-val	N. comb	% sign. coeff.	Result
Bivar Reg.	-	2.5230	1.6310	1.5469	0.1310	-	-	-
EB Min	-1.1129	2.1250	1.6190	1.3126	0.1788	(C. Jaublas	84.23%	Emaile
EB Max	5.9263	2.5520	1.6872	1.5126	0.2201	66 doubles	101.15%	Fragile
EB Min	-0.7582	2.4410	1.5996	1.5260	0.2502	220 1	96.75%	F
EB Max	5.9958	2.5223	1.7368	1.4523	0.2411	220 triplets	99.97%	Fragile

Tables 9: Continued

$Dvar = c_gdp$	X =	[geod pode]	Ζ :	= [bltrt bltry trop trsp ecsp drid oexr fidd fiop mopy cuab gnsa]				
Estim.	Bounds	Coeff.β	Std. Erro.	t	p-val	N. comb	% sign. coeff.	Result
Bivar Reg.	-	3.7890	0.8499	4.4580	0.0050	-	-	-
EB Min	1.7014	3.4156	0.8571	3.9850	0.0236	<i>((</i> 1, 11))	90.15%	Data
 EB Max	5.3646	3.4411	0.9617	3.5780	0.0320	66 doubles	90.82%	Robust
EB Min	1.6343	3.1100	0.7378	4.2150	0.0255	220 4	82.08%	Dahuat
 EB Max	4.5901	3.2121	0.6890	4.6620	0.0441	220 triplets	84.77%	KODUSI

Result of EBA on oiex at .75 confidence level and maximum VIF = 10

Result of EBA on geodat .75 confidence level and maximum VIF = 10

$Dvar = c_gdp$		X = [pode]	Z = [bltr	t bltry trop tr	sp ecsp drid o	bexr fidd fiop mop	y cuab gnsa oiex]	CI 95%
Estim.	Bounds	Coeff.β	Std. Erro.	t	p-val	N. comb	% sign. coeff.	Result
Bivar Reg.	-	-2.1250	0.5988	-3.5490	0.0150	-	-	-
EB Min	-3.6335	-2.2157	0.7089	-3.1256	0.1205	66 doubles	104.27%	Robust
EB Max	-0.8497	-2.2244	0.6873	-3.2363	0.1102	oo doubles	104.68%	
EB Min	-3.7163	-2.2256	0.7453	-2.9860	0.1501	220 1	104.73%	D.L.V
EB Max	-0.7102	-2.3260	0.8079	-2.8790	0.1589	220 triplets	109.46%	Robust

Result of EBA	on pode at .75	confidence level and	maximum	VIF = 10
---------------	----------------	----------------------	---------	----------

$Dvar = c_gdp$	2	X = [geod]	Z = [bltr]	t bltry trop tr	sp ecsp drid o	bexr fidd fiop mop	y cuab gnsa oiex]	CI 95%
Estim.	Bounds	Coeff.β	Std. Erro.	t	p-val	N. comb	% sign. coeff.	Result
Bivar Reg.	-	3.5520	1.3892	2.5569	0.1590	-	-	-
EB Min	-0.3553	3.0125	1.6839	1.7890	0.2563	66 doubles	84.81%	Erogilo
EB Max	6.4672	3.1123	1.6774	1.8554	0.2986	00 doubles	87.62%	Fragile
EB Min	-0.8626	3.1023	1.9824	1.5649	0.3256	220 4	87.34%	E
EB Max	7.3710	3.2230	2.0740	1.5540	0.3354	220 triplets	90.74%	riagile