

## COCHRANE-ORCUTT PROCEDURE IN RESPONSE TO THE EFFECTS OF EUROPEAN MONETARY UNION ON TRADE VOLUME BETWEEN EURO-AREA AND ALBANIA

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**Abstract.** *This paper considers one of most recent and fiery debates pertaining to the perspective of Albania's accession in the European Union (EU) such as adopting euro as its official currency. Beyond the latest, is firstly discussed if the country satisfies some of the optimal currency area (OCA) requirements aiming to compare and then explore the effects of European Monetary Union (EMU) membership as well as the future country benefits in term of EU trade volume especially related to import flows by using an autoregressive model through the Cochrane-Orcutt procedure and extending it within some important OCA's factors such as: GDP growth, unemployment, and inflation rates. By this way, operating with 95% confidence level can be also confirmed that the explored autoregressive model performance is good (as respective Fisher's statistic is higher than its theoretical value) and furthermore the residuals distribution is quite normal due to the precedent transformation of variables aiming their autocorrelation avoidance. But despite these, it simultaneously demonstrates that the currency union effects on Albanian trade are actually small. Hence, under these circumstances can be affirmed that Albania is a potential partner of European Monetary Union by referring to the actual situation as well as its future perspective. Beyond the facts, all this makes reflect that the existing heterogeneity between the areas analyzed is strongly related with the above mentioned areas economic structures and political preferences. Due to natural cases the latest seems to be the major source of heterogeneity by causing the breach of some OCA's requirements. So, the political will should intervene in order to stimulate the labor mobility, the degree of openness in these areas, the economic structure diversification through special financing programs in different sectors and finally be responsible for the areas common destiny by supporting there where possible with fiscal transfers and focusing on mutual benefits contemporary by facilitating the penetration of Euro-Area monetary policy which obviously can positively impact the bilateral trade in these areas. Thus, consequently is also discussed the Albanian political solidarity issue in order to respond and better act by pursuing the European directives through regulation as they can potentially bring alterations in the degree of OCA's fulfillment criteria by positively impacting the bilateral trade volume increase between these areas.*

**Keywords:** *bilateral trade, import flows, optimal currency area.*

### Introduction

The most crucial and immediate benefit of the Albania's accession in the European Union is undoubtedly related to Euro-Area trade in correspondence to competition earning, labor mobility, capital inflows, etc as the latest represents country's main business partner. Later on, this issue can be further explored on behalf of its integration to the European Monetary Union by attempting to boost the trade through the avoidance of the exchange rate costs and risks as well as the businesses effectiveness. *Consequently the arising question is if Albania fulfills the Optimal Currency Area's (OCA) criteria?*

For the time being Albania operates through a flexible exchange rate regime implemented since July 1992 where the current account transactions initiated to be performed in different foreign currencies, immediately after the country openness toward the international trade. In respond to this the country

openness seems to be also the main factor which has stimulated the heterogeneity of transactions in different currencies and expanded the trade volume by increasing the country's commercial deficit. Stating that, continuously the import flows in the country has been greater than the export ones while vice versa occurred within capital in-outflows. In any case worth mentioned that the trade and financial relations between EU and Albania have caused the occurrence of asymmetric shocks in the latest especially correlated with remittances and foreign direct investments fluctuations. Without taking into account these and other asymmetrical shocks incidence and probability, all this, makes difficult to the country the management of a proactive monetary policy by excluding the additional costs added pertaining to social providence programs. But in any case the different customer preferences and asymmetric demands are adjusted through a flexible exchange rate regime. So, as understood from the other side the appreciation/depreciation of the national currency not only amortizes the asymmetric shocks based on the circumstances but also directly impacts the country production which further affects the employment rate, its welfare, etc.

By this way the second leading question is: *Does the implementation of euro in Albania as official currency helps it benefiting from OCA at least initially under bilateral trade context?*

Theoretically standing the OCA theory itself is unclear for two main reasons:

- it doesn't refer to a certain currency area but just compares the benefits with respective country costs;
- and doesn't give a precise response if worth to be part of it or not.

But it just mentions some criteria which make acceptable the implementation of a common currency that can't be necessarily optimal. In fact, it generally predicts three economic and other three political criteria.

Thus, the first economic criterion is strongly related to asymmetric shocks within the country originated from EU zone. While the other two additional economic criteria pertaining to OCA refer to the country asymmetric shocks probability and respective impact on it. Moreover the additional three political criteria consider "the transfers" as well as "preferences" in terms of economic support to the countries negatively impacted from the previously mentioned asymmetric shocks. As below, theoretical and empirical responses were given by arguing on different factors which can make possible an outstanding performance of the OCA. Corresponding to these, being that Kosovo, in the quality of a neighbor country and commercial partner with the economic structure more similar to the Albanian one has already adopted euro as its official currency the study of "*Albania toward OCA*" through respective components sounds interesting.

#### *Labor mobility*

In response to the cost minimization as per asymmetric shocks Mundell (1961) responded that OCAs are identical in different economic regions, when is defined the inter-regional labor mobility. By explaining that the cost of an asymmetric shock for a certain country that's part of a currency union can be avoided if production factors (labor and capital) move quickly and there are no restrictions between these zones. Considering that the capital can move faster the issue arises mainly from the labor force. In other words, Mundell's core argument is that the flexible exchange rates between two countries are preferable to fixed exchange rates, unless the countries themselves do not form optimal currency areas. However, other troubles reveal if we consider the costs of having many currencies and for this purpose Mundell set other additional arguments against an extremely large number of currency areas as the forex exchange market between can be very thin. Furthermore, should be mentioned that in very small currency areas, imports are likely to play a huge role in regional consumption, which in turn weakens the possibility for money illusion and of course that's no our case.

But by strictly focusing on what Mundell (1961) proposed, can be affirmed, that he hasn't well defined the regional or inter-regional areas in geographic or political terms in respect of OCA framework and the same situation persists regarding its labor mobility and perfect occupational mobility. Obviously, if both situations are verified the optimal currency area is small. Later, Grubel (1970) claims Mundell's definition pertaining to regional and labor mobility by emphasizing the rigidity of its practical application. In the same point of view argued Corden (1973) concerning the relevance of labor mobility

in the asymmetric shocks adjustments. Because on his argument in short-time periods the labor mobility is quite impossible as it is also the capital mobility while in long-run the latest cannot adjust the asymmetric shocks in two different countries. That's why, Giersch (1973) responded that Mundell's concept of factor mobility implies that in the long run the world is an OCA. Under this context he highlighted that migration negatively impact the countries balance of payment adjustment since it is irreversible. While McKinnon (1963) differently treated the mobility factor in an OCA, he distinguished two important moments on it:

- as a mobility factor among the regions;
- as a mobility factor among industries by adding to this definition the country openness in term of trade.

He also demonstrated that if the countries consistently trade between them the price applied to their goods don't differ so much because the competition equalizes them if they are expressed in same currency. So, in those cases of asymmetric shocks the mobility factor can be a neutralizer. The opposite is stated (De Grauwe, 1994, p.72) in respect of low labor mobility, sticky prices and no fiscal transfers between countries. But precisely, on respective work of 1969, Kenen was exactly focused on the mobility factor analysis where also concluded that "*labor mobility requires perfect occupational mobility*", what means that the labor market is homogeneous (similar skill requirements are posted). Statistically based, the Albanian workers are considered dynamic in contrast with the Europeans but in any case they can't fit anywhere as the labor market is not homogenous. Thus, a potential educational reform should appropriately take into consideration the implementation of professional programs similar with the Euro-Area ones aiming to enhance the labor mobility in and out country.

Returning to Kenen's central point, he agreed on the asymmetric shocks as the main problem related to the monetary unions performance after having largely analyzed the origins of asymmetric shocks. In his thesis he defends that the production diversification criteria can handle the asymmetric shocks even when they have considerable probability of occurrence in the countries which have formed the currency unions.

Thus, the countries that become prey of specialization in certain fields suffer more the asymmetric shocks. From his opinion countries with similar economic structures that are in strong commercial relations can form the OCA. Also Bofinger (1994) relies on this by having as example one country affected from a negative demand shock for a certain good, which represents a minor proportion of the entire country production that isn't produced in other countries even why no labor mobility is required.

#### *Degree of country openness*

The second important contributor to OCA's theory is McKinnon (1963), who pointed out the country relevance as the most crucial criteria in forming OCA. He noted that countries with a high degree of openness are more advantaged from the fix exchange rate which favors also an OCA. Worth also mentioned, that McKinnon (1963) argues that the economies with high ratio to tradable to non tradable goods should be more reliable on the respective fiscal policies as well as on the monetary policies than on the exchange rates adjustments to handle the balance of payments disequilibria. Thus, small countries that trade extensively find it beneficial to form OCA with respective trade partners. Starting from the same point but alternatively arguing Giersch (1973) suggests that: the more open is the economy the more it may need the exchange rate flexibility, since it may be more exposed to cyclical disturbances from the outside world from which it wants to isolate itself. Under this context, the McKinnon (1963) thesis favors fix exchange rates in the small open economies by avoiding the potential money illusions. Some years later the results of Tower and Willett (1976) maintain the view that the benefits from a monetary union increase with the country degree of openness even why in a dynamic framework the previously mentioned arguments are hardly valid. In this respect, Albania is more than opened toward the international trade that's why the hypothesis of country involvement in EMU may be profitable.

#### *Degree of product diversification*

As previously mentioned Kenen (1969) is the third pioneer of OCA who contributed on it by introducing the degree of products diversification in order to meet the OCA's criteria. In contradiction with

Mundell's arguments related to total occupational mobility in OCA's support he believes more on country products diversification. By this way, he affirmed that well-diversified economies will rarely face asymmetric shocks in comparison within less-diversified economies by representing an advantage for the OCA. But to the Kenen (1969) purpose, Mundell (1969) responded that the most diversified economy is the world economy and the usage of a common currency is the best solution. From the other side, Méliitz (1995) finds utopic that a country which hasn't diversified its production structure benefits from the exchange rate fluctuation. The product diversification remains another issue in the Albanian economy which is currently managed through the import structure even it has preserved a positive trend by generating a commercial deficit.

Realistically dealing the product diversification is mainly related to competitive advantages between countries. But as known many countries that are part of EU have invested in specific fields on behalf of EU needs in response to development programs by contemporary acting in contrast with OCA's requirements.

### *Trade volume*

Normally, a currency union is expected to positively impact on countries trade volume as at least the forex risk is avoided and the competition is enhanced. But during 1990 the major part of studies didn't identified a significant relationship between the exchange rate and trade. Anyway in 1994 Côté explored related literature from 1988 to 1993 and founded that the effects of volatility on trade volume between partner countries are uncertain even why the previously mentioned studies negatively argue on it, and same results were confirmed later (Baum & Caglayan, 2007, p.85). While, in the same time distance with other two studies Rose (2000) opened a new chapter in international economics by implementing the popular gravity model of trade aiming to evaluate the currency union effects on trade. In this model he presented the trade volume between two economies as a function of their economic mass production (GDP), distance and series of other factors. According to respective evaluations, two countries sharing a common currency trade three times as much as they would with different currencies and by this way Rose's study showed a strong negative effect of exchange rate volatility on trade. Contemporaneously, Rose demonstrated that there is no trade diversion or supply switching from non-members because of the increased trade within the currency union, meaning that members equally trade within currency union members and not. However, Rose (2000) arguments are criticized from several authors on different econometrics points, first of all because the sample of countries used from Rose's dataset was extremely heterogeneous. But the situation is completely different for Europe and it is not possible to equate Rose's findings for the trade consequences in Euro-area. Two years later Glick and Rose (2002) performed a new analysis by using a panel data obtained with fixed effects estimation for the reduction of "Rose's effects" of about one third. Precisely, this gives the answer to the question that policymakers want to hear on the impact of OCA on those countries that join for its constitution. But in any case, Glick and Rose's (2002) sample ended on 1997, before the creation of EMU, so their result weren't relevant and cannot be used to explain the impact that trade had on EMU members. A year ago to the later, other authors (Persson, 2001; Tenreyro, 2001) applied different statistical methods for trade estimation purposes on OCA, by giving contradictory results. By this way, Persson (2001) estimated a reduction on trade effects which wasn't statistically significant, Tenreyro (2001) instead, worked with aggregated trade flows over five years while dealing with the endogeneity problem by estimating the trade equation jointly with the country decision to participate in an OCA.

### *Alternative arguments to OCA*

Several studies have additionally brought important details related to OCA theory, and the most debated are: Corden (1973), Ishiyama (1975), Mundell (1973), and Tower and Willet (1976), because each of them is distinguished for the novelty in treating and explaining the OCA theory.

Firstly, Corden (1973) argued that joining an OCA with a group of trade partners impacts the control over the monetary policy as well as on the exchange rate regime. And the loss of control means a lot, almost when monetary policy plays the "leverage effect" in the country development. By his point of view wages and price flexibility are the most important criteria in forming an OCA and these arguments

brings on the conclusion that in countries which have different inflation rate preferences the formation of OCA can be costly. While Mundell (1969), insists on the labor mobility as an important factor for the persistence of OCA almost when the countries are financially integrated. This represents a dynamic and realist assumption as the financial capital moves much more easily than labor force and physical capital.

Contrary with the others, Ishiyama (1975) analyzed deeply and more closely the existence and OCA's performance by bringing into question the cost-benefit analyses before acting. He put on the OCA's relevance other additional factors such as: differential of inflation rates and wages.

While putting it all together Tower and Willet (1976) demonstrated that the increase of factors taken under consideration for OCA purposes improved the analysis by considering it not only a theory but as a real approach with respective "*pros and cons*" under determined conditions. Their considerations enhance the usefulness of the money in an OCA pertaining to smaller and open economies supported by the internal macroeconomic policies.

#### *Albania toward OCA*

Due to its economic structure constitution Albania is currently the country mostly affected from the asymmetric shocks derived from Euro-Area in Balkan region which are: "*slowly transmitted to the Albanian economy through a rapid fall of the remittances from the migrant workers, a jump of fiscal deficit, the increase of public debt, a sudden lending decline, an immediate fall of the foreign direct investments, an abducted increase of the inflation rate pursued from a partial trade collapse, etc*" as argued from Todri (2012, p.51).

Under these aspects, the usage of the flexible exchange rate represents a strong instrument toward the asymmetric shocks especially derived from Euro-Area as per the intensive commercial and financial relations that the two above mentioned areas have. Logically, it seems to be the main reason why the submission of monetary policy together with exchange rate flexibility can be costly for the country future integration in Euro-Area. *But are the above mentioned asymmetric shocks frequent and consistent?*

As discussed, the main factors which constitute the country's asymmetric shocks derived from Euro-Area are: foreign direct investments; remittances; unemployment rate; trade balance; the country openness; public external debt, etc.

And each of them has a significant weight in the Albanian GDP growth since the fall of communist regime more than 23 years ago. Consequently, attempting their avoidance normally that Albania could be part of "Euro-Area" after having fully accomplished the OCA's requirements, meaning:

- *Product and trade specialization*-even why the evidences on the field are controversial. From a certain point of view is argued that the trade brings a deeper specialization as every country focuses there where the competitive advantages are. And in these cases the country's export structure is quite different from the imports one and over time this goes on the opposite side of the monetary union synthesis. Differently said, if the export-import structure is similar in the country the consumer has a larger choice and through it the trade can be normally diversified. The latest, represents the Albanian economy case and furthermore similar evidences theoretically support the trade diversification and the monetary union integration what's also expected to generate benefits in Euro-Area.

- *Labor market flexibility*-has been dynamic during over last twenty years. During this period the unemployment rate has decreased but is still high while the social insurances have preserved a positive trend but anyway they aren't still enough considering respective "informal-economy" statistics. Should also be mentioned that the labor market in the country is still rigid even why a consistent part of the labor force is active in Euro-Area and the same can be affirmed for the wages. From the other side the young and inactive labor force in the country isn't prone to work away due to political and social issues.

- *Fiscal transfers*-The Euro-Area is dealing with the implementation of some fiscal transfers schemes but as far as Albania isn't part of it cannot benefit. By this way no oriented support is achieved under OCA's framework implementation.

- *Political issues*-The Euro-Area itself isn't totally a perfect OCA as it partially fulfills the requirements needed. And by this way, the labor force shift isn't fully possible, the production isn't well diversified, differential in inflation rates exists, etc.

Thus, initially the Albanian integration issue in Euro-Area sustained through different reforms is a political decision versus the current situation of the country and for this purpose the intensification of trade relations with Euro-Area constitutes a particular interest toward the EMU. Hence in the next section the above mentioned issue is empirically estimated.

### **Research method**

This research has been carried out in order to estimate the impact of EMU's criteria corresponding to Euro-Area and Albania bilateral trade. Precisely, the relationship between Euro-Area exports with Albania and respective inflation, GDP growth and unemployment rates is analyzed with the help of Gretl.

#### *Data collection and analysis*

The secondary data used in this research refer to a ten year time period (monthly data are used), specifically from 2002-2012 and is operated with the 95% confidence level. Concretely, the empirical analysis is performed by using the Autoregressive Estimation Method, exactly through Cochrane-Orcutt procedure, which represents a simultaneous equations system as the main tool of econometric analysis in the field of macroeconomics. That's because, its performance in terms of predictive ability of macroeconomic variables is superior in comparison with other simultaneous structural equations.

#### *Research hypothesis*

The Albanian GDP growth rate together with Euro-Area's unemployment rate positively affects the bilateral trade between these areas.

### **Determinants of trade volume analysis**

There are many factors which have a direct/indirect impact on bilateral trade growth between Euro-Area and Albania. Having as main goal the identification of variables that impact on bilateral trade volume growth between these areas (as during last ten years it remained quite stable) are analyzed and compared three macroeconomic variables per each area according to OCA's theory.

#### *The GDP growth rate trend*

The GDP growth trend (Figure 1) between Euro-Area and Albania seems to be quite perfectly correlated at first difference. So, starting from 2002-2008 the GDP growth trend in Euro-Area has maintained a positive growth, its immediate decrease on 2009 refers to global financial crises influence in Euro-Area and since then the decrease of GDP has further continued on 2012. The same trend but in lower results persists in Albania while the GDP growth rate during the year 2012 is almost identical for both areas. So, referring to the latest GDP structure and to the previously mentioned results can be affirmed that Albania imports the benefits as well as the asymmetric shocks derived from Euro-Area.

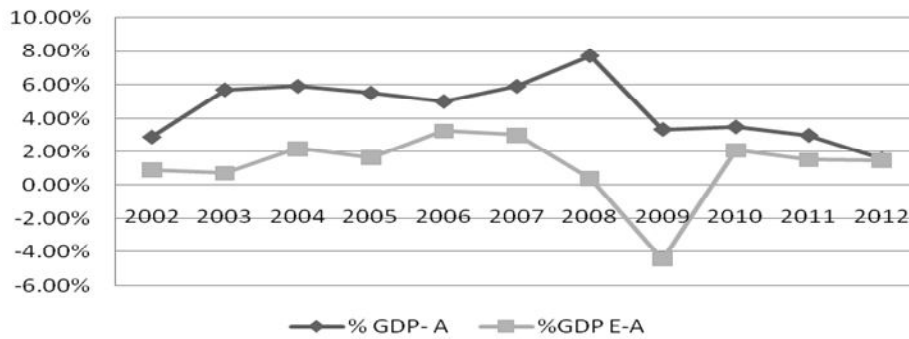


Figure 1. GDP growth rate trend in Euro-Area and Albania (Eurostat, 2013; World Bank, 2013)

The inflation rate trend

While the inflation trend (Figure 2) between Euro-Area and Albania shows opposite results in comparison with the GDP growth trend, as the inflation rate in Albania has been continuously higher than the one in Euro-Area. Thus, seems that somehow the high inflation has hindered the Albanian GDP growth due to the weakness of the local currency in comparison with its current account transaction currencies. Therefore, beyond the transaction costs the usage of euro as its official currency can leastways theoretically enhance the trade volume in and outside Euro-Area.

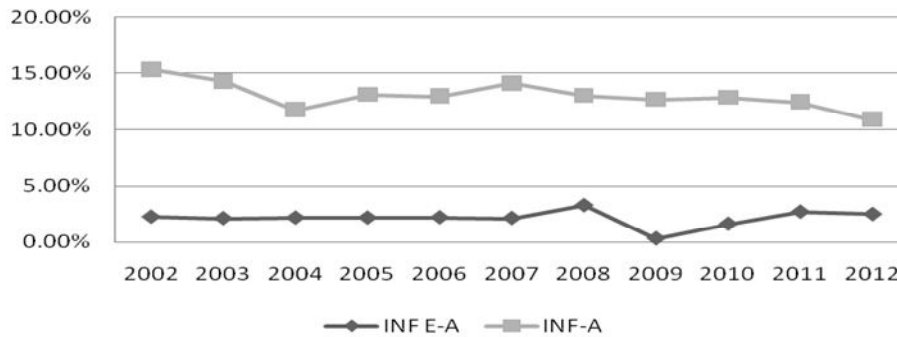


Figure 2. Inflation rate trend in Euro -Area and Albania (Eurostat, 2013; World Bank, 2013)

The unemployment rate trend

Even why a considerable part of Albanian active labor force is employed in Euro-Area the unemployment rate in Albania has always been higher than Euro-Area rate, and the same persists also during the year 2012 (Figure 3). But as the labor cost is lower in Albania it represents one of the strongest points for the entrance of different Euro-Area direct investments and not only in the country. Then, assuming the implementation of a currency union, together with the positive shift of the Albanian salaries can be simultaneously increased the Euro-Area investments in the country. All this not only makes businesses more competitive but gives to the employees the chance to easy move into Euro-Area for work purposes and logically the unemployment rate in country can be further decreased.

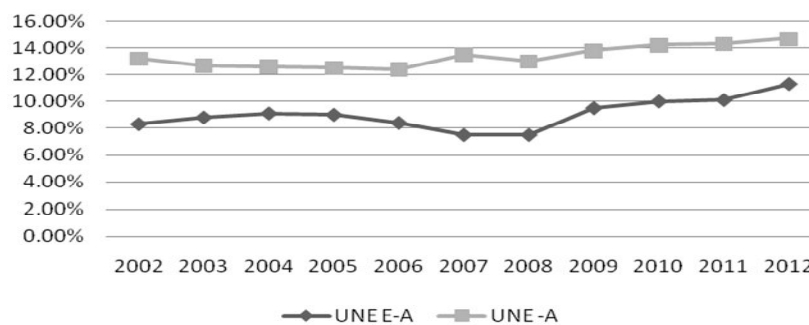


Figure 3. Unemployment rate trend in Euro-Area and Albania (Eurostat, 2013; World Bank, 2013)

### *The effects of EMU on bilateral trade*

As previously mentioned, the effects of EMU in Albania on respective exports volume by dealing with some OCA requirements (as analyzed in Tabel 1) are estimated with the help of Autoregressive Estimation method, precisely through Cochrane–Orcutt procedure.

Hence, is:

- 1) determined an estimated  $\rho$  (auto-regression factor for each variable) for the first lag;
- 2) the variables examined are transformed (made stationary);
- 3) build the simultaneous regression.

The Cochrane–Orcutt procedure's performance is evaluated through its Fisher coefficient and residuals plot diagnostics which have reconfirmed respective "white-noise" phenomenon.

### **Conclusive remarks**

The research question of the study is confirmed as the empirical analysis results showed that the increase of Albanian GDP growth rate as well as the unemployment rate in Euro-Area can positively impact the trade volume between two areas (Table 1). Operating with 95% confidence level can be affirmed that the autoregressive model performance is good (as the Fisher statistic is higher than respective theoretical value). While residuals distribution is quite normal (as presented in the Figure 4), due to the precedent transformation of variables aiming the errors' autocorrelation avoidance by confirming the robustness of method used. The confront with Kosovo's results can't be done as on January 2002 the latest switched from the use of Deutsche Mark and Dinar into euro as official currency through a technical decision supported from the cooperation with European Central Bank and several national banks in Euro-Area.

**Table 1. Autoregressive model results of Cochrane-Orcutt, using the monthly 2003-2012 observations**

Export_volume between E-A/A				
rho = -0.461947				
Variable	Coefficient	Std. Error	t-ratio	p-value
GDP_A	0.274491	0.0610527	4.4960	0.01086**
GDP_E_A	0.0368164	0.0444354	0.8285	0.45394
INF_E_A	-0.0864802	0.143714	-0.6018	0.57978
INF_A	0.187404	0.065879	2.8447	0.04665**
UNE_E_A	0.36821	0.0920744	3.9991	0.01614**
UNE_A	0.231754	0.0953037	2.4317	0.07185*
Mean dependent var	0.100000			
Sum squared resid	0.000021			
F(6,4)	6807.357			
rho	-0.122713			
S.D. dependent var	0.000000			
S.E. of regression	0.002287			
P-value(F)	5.75e-08			
Durbin-Watson	2.005815			



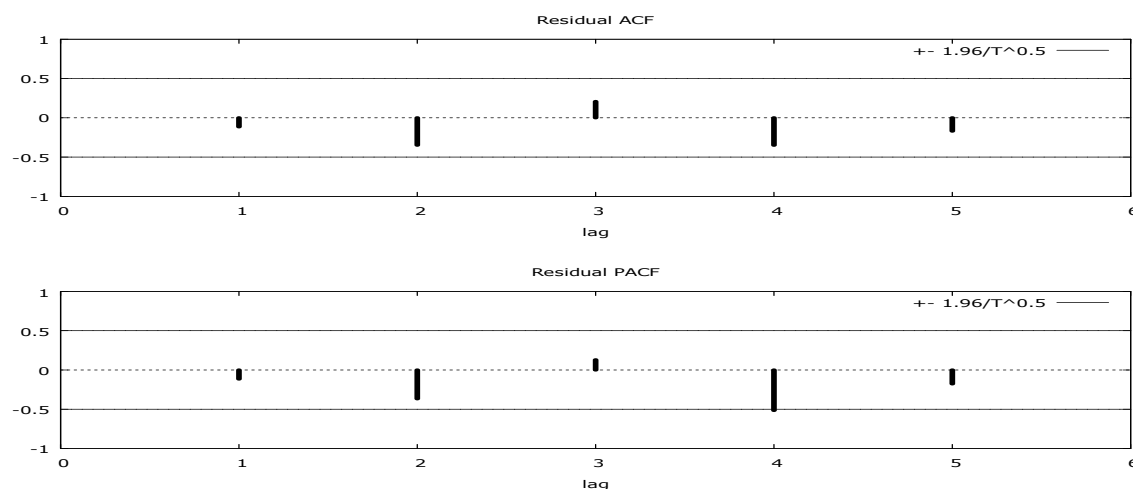


Figure 4. Cochrane-Orcutt procedure errors autocorrelation

However, under these circumstances can be added that Albania is a potential partner of European Monetary Union referring to the actual situation as well as its future development perspective. Because beyond the facts, all this makes reflect that the existing heterogeneity between the areas analyzed is strongly related with their economic structures and political preferences. Due to natural cases the latest seems to be the major source of heterogeneity by causing the breach of some OCA's requirements. So, the political will should intervene in order to stimulate the labor mobility, the degree of openness in these areas, the economic structure diversification through special financing programs in different sectors and finally be responsible for the areas common destiny by supporting there where possible with fiscal transfers and focusing on mutual benefits contemporary by facilitating the penetration of Euro-Area monetary policy itself and its coordination with those of the EU-candidates.

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