*International Journal of Economics, Management and Accounting* 26, no. 1 (2018): 229-245


# FEASIBILITY OF A MONETARY UNION IN ISLAMIC REGIONS OF OIC COUNTRIES: NEW EVIDENCE FROM COMPETITIVENESS DIFFERENTIALS

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## ABSTRACT

The purpose of this study is to assess the feasibility of forming a common currency area in Organization of Islamic Cooperation countries (OIC). Based on the experience of Euro area in recent crises, this article emphasizes economic competitiveness differentials as a benchmark Optimum Currency Area criterion. In order to detect competitiveness differentials, this study relies on panel co-integration techniques and uses the Pooled Mean Group method. Then the exchange rate misalignments in these countries are calculated and the co-moved pattern of misalignments and the sigma convergence of exchange rate misalignments are analyzed. The results indicate that most of Islamic regions experience diminishing competitiveness differentials and there is an obvious convergence in economic competitiveness levels in Islamic regions. In addition, the countries of Arab Economic Unity (AEU) are experiencing the lowest exchange rate misalignment; hence, it seems this is the most appropriate region satisfying the preliminaries of forming a common currency area.

JEL Classification: F33, F31, F53

Keywords: Optimum currency area, Competitiveness differentials, Exchange rate misalignments, PMG method, Islamic regions

## 1. INTRODUCTION

After the launch of the Euro as a single European currency in 1999 and its relative success in improving macroeconomic performance of the participating countries, other countries started thinking about

forming monetary unions. Members of the Organization of Islamic Cooperation (OIC) countries are not exempt from this principle.[1] Indeed, the OIC is the second largest inter-governmental organization encompassing 57 Islamic countries. Increasing economic cooperation and regional integrations are the most important aims of the OIC. To increase economic cooperation, the OIC made a significant move in declaring the target date for establishing the Trade Preferential System (TPS-OIC). In addition, strengthening intra-Islamic economic and trade cooperation, establishment of an Islamic Common Market and unifying the efforts of Islamic countries are highlighted in the blue print of the Ten-Year Program of action in the OIC. Economic and monetary unions are considered as the advanced forms of international integrations that will help the OIC organization to reach its targets. After the Asian financial crisis in 1997 that caused significant reduction in trade between OIC countries and developed countries, the OIC countries become more determined than ever to create greater trade cooperation among themselves and use a common currency independent of the US dollar.

The literature on optimality of a currency union in Islamic regions and enhancing economic cooperation among them are unlimited and they found scope among some Islamic countries for potential monetary integration.[2] In accordance with the Optimum Currency Area (OCA) theory, the disadvantages of a common currency are evident when the countries have heterogeneous economies and face asymmetric shocks. Indeed, many macroeconomic variables characterize the economic structures and should be considered in evaluating optimality of currency union.[3] Emphasizing on just one of these variables will generate misleading results and inconclusiveness as pointed out by Tavalas (1994), Mongelli (2008) and, Coulibaly and Gnimassoun (2013). To overcome this problem, we need a universal criterion to consider most of OCA criteria in a unique model. In this context, using exchange rate misalignment allows us to use several OCA criteria in a comprehensive model.

Exchange rate misalignment is affected by various variables and these variables are related to OCA criteria. Exchange rate misalignment is defined as the difference between the observed exchange rate and its equilibrium level. Equilibrium exchange rate secures the economy to reach its internal and external equilibrium. Then any misalignments from the real equilibrium exchange rate will

lead the country to lose her international economic competitiveness. In a common currency area, large differences in economic competitiveness levels among member countries will cause current account imbalances across countries and threaten the stability of the OCA itself. In addition, arranging common policies would be difficult for the central bank in a monetary union. Thus a viable and sustainable monetary union is one where its members have similar competitiveness levels (Coudert, Couharde, and Mignon, 2013; Saadaoui, 2015). The financial crisis in 2008 resulted from persistence in different wage, price and productivity dynamics among EU members that caused divergent external and internal imbalances within the monetary union and persistent losses in competitiveness level of member countries. These kinds of losses in competitiveness and growing external and internal imbalances not only increased the economic and financial vulnerability of individual countries, but given the strong financial and trade interconnectedness of the Euro area countries, they also hindered functioning of the euro area as a whole.[4] In this context, Rusek (2012), Coudert et al. (2013), Duwicquet, Mazier, and Saadaoui (2016), Hajek (2016) and Comunale (2015) studied the exchange rate misalignment behavior and competitiveness differentials among Euro members and analyzed the sustainability of the Euro zone. These studies showed that exchange rate misalignments and loss of competitiveness levels in Euro countries played a predominant role in economic and political tensions in the Euro zone and caused financial crises.

The purpose of this study is to assess the feasibility of a common currency among OIC member countries through analyses of economic competitiveness differentials. The rest of the paper is organized as follows: Section 2 presents some economic perspectives of OIC countries. Section 3 describes the ethodology and data. Section 4 gives the results and section 5 concludes the article.

## 2. PERSPECTIVES OF ECONOMIC STRUCTURES IN OIC COUNTRIES

The OIC organization accounts for more than 22% of the world population but produces only 11.2% of the world total GDP in 2013 (International Monetary Fund, 2015). The total share of OIC countries in world merchandise exports was 12.2% and the share of OIC countries in global merchandise imports reached 10.7% in 2013.

In the post-crisis period, intra-OIC trade registered a relatively stronger upturn compared to the OIC countries' trade with the rest of the world. Accordingly, as of 2013, intra-OIC trade accounted for 18% of OIC countries' total merchandise trade with the rest of the world. The overall inflation level is more or less stable in OIC countries. Even the countries in transition, which experienced hyperinflation in the early 1990s, started recently to bring it under control. Inflation in the OIC countries is generally lower than in developing countries. The ratio of debt to GDP in OIC countries is high compared to other developed countries but lower than in developing countries. However, according to the OIC annual report in 2015, the share of debt to GDP in OIC countries has seen a downward trend over the last decade.

According to the World Bank classification, 26% of OIC countries are classified as low income with per capita income below USD1,045. The lower middle income group contains 32% of OIC members. The higher middle income class consists of 28% of members. Finally 12% of OIC members are categorized as high income countries with per capita income more than USD12,737. The analysis of cumulative density of GDP growth in OIC countries over 1980-2014, shows that more than 80% of OIC members experiencing positive growth rate.

In 2014, the GDP per capita ranges from USD293 in Niger to USD63,479 in Qatar. The box-plot analysis for GDP per capita growth rate in OIC countries over 5 sub-periods has been done. The first plot in sub period of 1990-1994 shows that half of the countries have GDP per capita growth in a larger box and the distribution is also compressed with larger outliers. It shows that in this period the real GDP per capita growth was more different between countries and they experienced different levels of growth. The distribution then becomes more and more compressed in the next subsample periods and the outliers gradually decreased until 2004. It refers to an increasing convergence in GDP per capita growth rates until 2004; then some divergence during the crises in the period of 2004-2009, and again a reverting to convergence during the post crisis period of 2010-2014.In addition, the mean of GDP per capita growth gradually increased over 1990-2009; meanwhile as the result of recession in 2008, the mean of GDP per capita growth decreased in the period of 2010-2014.

In order to check the convergence of economic growth through OIC members, the Kernel estimated distribution of GDP per

capita growth rates for 1990, 1995, 2000, 2005, 2010 and 2014 are analyzed. In 1990, the skewness is obviously trended to the right hand side. Indeed, the countries with relatively lower GDP per capita are found on the left and high income countries are found on the right. The distribution changes somewhat over the years and economic growth has a slight movement toward the right hand side of the GDP per capita growth compared to that of the 1990s. It indicates that more countries enjoyed a relatively higher standard of living than in 1990. The distribution in 1995 is skewed to the left hand and has a fat tail that shows a bulk of countries experienced decrease in the GDP per capita growth rate. However GDP growth rates show stronger convergence in 2014 and the distribution has a bell shape that shows a reduced dispersion of GDP growth and convergence. In addition there are two little peaks around the right and left tails. In this period some of OIC countries were devastated by conflict.

## 3. METHODOLOGY AND DATA

This study assesses the feasibility of common currency among Islamic countries based on comparison of competitiveness levels among them. The behavior of real exchange rate misalignment is an appropriate index to measure economic competitiveness through member countries because real exchange rate affect and will be affected by many macroeconomic fundamentals. In order to assess the behavior of exchange rate misalignment in OIC countries, this study applies the Coulibaly and Gnimassoun (2013) model. According to this model, the equation of the real exchange rates is as follows:

$$\text{Reer}_{it} = \alpha_i + \beta_1 \text{Prod}_{it} + \beta_2 \text{Nfa}_{it} + \beta_3 \text{Tot}_{it} + \beta_4 \text{Open}_{it} + \beta_5 \text{Gov}_{it} + \varepsilon_{it} \quad (1)$$

where $\text{Reer}_{it}$is the real effective exchange rate of country *i*,$\text{Prod}_{it}$ is productivity differentials, $\text{Nfa}_{it}$ is net foreign asset position, $\text{Tot}_{it}$ indicates terms of trade, $\text{Open}_{it}$ indicates openness and $\text{Gov}_{it}$ shows the government spending. The real effective exchange rates are extracted from Darvas (2012) working paper database that has been updated in 2015. The Real effective exchange rates are calculated as weighted averages of bilateral exchange rates adjusted by relative

consumer prices, the basket used to calculate effective series comprising 67 countries and the weights being based on bilateral trade. Other variables are from the World Bank (2015) database. Using annual data for the period 1980-2014, the model presented in equation 1 will be estimated by the Pool Mean Group (PMG) method.[5] The real exchange rate misalignments are calculated as the difference between the current level of real exchange rate and the long run equilibrium exchange rate estimated from equation 1. We investigate the behavior of regional and intra-regional exchange rate misalignment in OIC regions.[6]

It is important to note that political integration is an important criterion which boosts the process of monetary integration and the regional economic blocks can pave the road to political integration. However Islamic countries do not enjoy complete political integration. In order to overcome this problem, this study considers Islamic countries in the form of regional blocs that formed in the body of OIC countries. Because these blocs have adequate political integration, forming monetary union in regional blocs is more feasible. OIC organization is mainly composed of the following bodies: Arab Maghreb Union (AMU), Council of Arab Economic Unity (AEU), Gulf Cooperation Council (GCC), Economic Cooperation Organization (ECO), Developing-8 (D-8) countries, Economic Community of West African States (ECOWAS), West African Economic and Monetary Union (WAEMU) and The Central African Customs and Economic Union (UDEAC) where 50% of its members belong to Islamic countries.

## 4. RESULTS

Before estimating model (1) the non-stationarity in level of all variables was checked; then the Westerlund (2007) panel co-integration test was applied.[7] The results are summarized in Table 1. This test provides four statistics: two consider the heterogeneous co-integration vector ($G_t$ and $G_a$) and two consider the homogeneous co-integration vector ($P_t$ and $P_a$). The results strongly reject the null hypothesis of no co-integration between real effective exchange rate and its determinants in the long run.

After testing for co-integration between the real effective exchange rate and its determinants, the long run relationship is estimated by applying the pool mean group (PMG) estimator. An Akaike information criterion indicates that the optimal lag for variables is three.

TABLE 1
Westerlund Co-Integration Test

| Statistics | Values | *Z*-Values | *p*-Values |
|---|---|---|---|
| $G_t$ | -2.402 | -3.048 | 0.001 |
| $G_a$ | -8.197 | 1.754 | 0.960 |
| $P_t$ | -26.378 | -11.35 | 0.000 |
| $P_a$ | -13.161 | -7.148 | 0.000 |

According to the results (Table 2), all explanatory variables, except for terms of trade, have expected and statistically significant effects on the real effective exchange rate. Productivity has a positive effect on the exchange rate and it proves the existence of the Balassa-Samuelson effect in these countries. The net foreign asset position has positive and significant effect. The terms of trade have negative but insignificant effect indicating that the substitution effect has outweighed the income effects. The positive sign of government expenditure shows that the main body of government expenditure is made up of non-tradable goods. Openness has positive effect on exchange rate. This result shows that the openness leads to improved current account such that the exchange rate appreciated.

TABLE 2
PMG Long Run Co-Integration Results

| Variables | Coefficient | *t*-value | Prob. |
|---|---|---|---|
| Gov | 0.05 | 9.84 | 0.0000 |
| Prod | 1.55 | 8.94 | 0.0000 |
| Open | 0.0032 | 4.30 | 0.0000 |
| Nfa | 0.45 | 7.79 | 0.0000 |
| Tot | -0.0066 | -0.33 | 0.7382 |

Homogeneity of regional misalignments in OIC regions: After estimating the long run coefficients in equation 1 the misalignments are extracted as the difference between current real effective exchange rate and their equilibrium levels. Then the weighted average of regional misalignments in Islamic regions in the period of 1980-2014 analyzed. The mode of regional misalignments progression display slight differences in levels in regions but these differences decreased in the last decade and disappeared over the last 5 years. The ECOWAS, WAEMU, GCC and UDEAC regions

experienced high and roughly co-moved misalignments. A similar pattern of exchange rate misalignments was found in ECO and D8 countries, while the level of misalignment in these two regions was lower than that of the other four regions. The AMU region also experienced the same trend of misalignment but at lower level. In addition the evolution of misalignment in AEU countries is very different from the others and it is the lowest in terms of overvaluations and undervaluation. The lower level of overvaluations and undervaluation in AEU countries shows that exchange rates in these countries could secure the economy to reach internal and external equilibrium and the stability of a monetary union among these countries is secured and arranging common policies would be reachable for a central bank to overcome instability over these countries. In addition, according to the World Economic Forum report on Arab world competitiveness in 2013, the Arab world has witnessed many changes over the past few years and most of them started the political and economic transition process.

The position of Arab countries within global ranking showed that Qatar is the most competitive economy, followed by Saudi Arabia and the United Arab Emirates. Oman, Bahrain and Kuwait occupy positions lower in the ranking. Libya, Morocco, Egypt and Algeria showed relative strength in health and basic education, market size and the macroeconomic environment. North African economies face significant challenges related to labor-market efficiency and institutions. More labor-market flexibility and more efficient allocation of talent, as well as a fundamental overhaul of the institutional framework, will be crucial for creating growth and employment in these countries. Lebanon and Jordan benefit from relatively strong educational outcomes but are challenged by infrastructure shortages and their small market size. For the Gulf region (Bahrain, Qatar, Saudi Arabia, Kuwait, Oman, UAE and Yemen), the stable macroeconomic environment is a major advantage. These statements are reflected in the evolution of misalignment overtime as two different periods singled out for the evolution in our analysis (i.e. before and after 2000). Indeed from 1980 through 2000 OIC regions experienced a mix of overvaluation and undervaluation while undervaluation appeared substantial after 2000 and regions (especially AEU) experienced smoother fluctuations in their misalignments. This undervaluation after 2000 led OIC countries to gain competitiveness level in international markets. However new political irritations among Qatar and Saudi Arabia may harm their international competitiveness level.

Correlation of intra-regional misalignments: Table 3 compares the correlations between regional weighted averaged misalignments during two sub-periods of 1980-2014 and 2000-2014. The table highlights some important facts. There is no significant negative correlation coefficient between OIC regions. There are stronger positive relationships between two pairs of AEU-AMU and ECO-D8 both before and after 2000.

TABLE 3
Correlation of Weighted Misalignments in Islamic Regions
(1980-2014)

| | AEU | AMU | D8 | ECO | S | GCC | UDEAC | WAEMU |
|---|---|---|---|---|---|---|---|---|
| AEU | 1 | 0.82 | 0.40 | 0.42 | -0.30 | 0.23 | -0.21 | -0.12 |
| | | (0.00) | (0.13) | (0.09) | (0.26) | (0.39) | (0.43) | (0.66) |
| AMU | 0.81 | 1 | 0.28 | 0.03 | -0.10 | -0.17 | 0.12 | 0.14 |
| | (0.00) | | (0.30) | (0.30) | (0.71) | (0.53) | (0.66) | (0.60) |
| D8 | 0.08 | -0.01 | 1 | 0.98 | 0.08 | 0.26 | -0.14 | -0.21 |
| | (0.64) | (0.96) | | (0.00) | (0.75) | (0.34) | (0.61) | (0.44) |
| ECO | -0.08 | -0.18 | 0.94 | 1 | -0.02 | 0.27 | -0.12 | -0.18 |
| | (0.64) | (0.29) | (0.00) | | (0.94) | (0.31) | (0.64) | (0.50) |
| ECOWAS | 0.63 | 0.59 | 0.09 | -0.14 | 1 | -0.31 | 0.25 | -0.04 |
| | (0.00) | (0.00) | (0.58) | (0.42) | | (0.24) | (0.36) | (0.88) |
| GCC | 0.68 | 0.62 | 0.11 | -0.07 | 0.62 | 1 | -0.51 | -0.15 |
| | (0.00) | (0.00) | (0.51) | (0.67) | (0.00) | | (0.06) | (0.58) |
| UDEAC | -0.08 | 0.06 | -0.06 | -0.08 | 0.22 | -0.08 | 1 | 0.39 |
| | (0.64) | (0.69) | (0.71) | (0.61) | (0.20) | (0.63) | | (0.14) |
| WAEMU | -0.13 | 0.06 | -0.04 | -0.04 | 0.14 | -0.08 | 0.80 | 1 |
| | (0.43) | (0.71) | (0.81) | (0.80) | (0.41) | (0.65) | (0.00) | |

Note: numbers in parentheses are p-values.

The sigma convergence analysis of misalignments through OIC regions done in the next step. The results of sigma convergence analysis are reported in the appendix. An important result that can be highlighted from this analysis is that the misalignments in the whole set of OIC regions are not persistent and the standard deviations of exchange rate misalignments have reduced over the last decade. There is an obvious convergence between economic competitiveness in OIC regions. In addition, the dispersion of misalignments within all regions displays a downward trend, but converging to different levels. The GCC region has the lowest dispersion of misalignments. The UDEAC and WAEMU regions have the second and third lowest misalignment dispersion and it converges to 2. It shows that the competitiveness level in GCC countries are more converged. Also

the difference between competitiveness levels of UDEAC and WAEMU are diminishing, as they are going to experience a similar level of competitiveness. AMU and AEU regions experience the same level of misalignment dispersions and the dispersions diminish over time but do not converge to lower levels. In contrast, the dispersion of misalignments in the D8, ECO and ECOWAS regions are larger than others. However the dispersions are diminishing and converging, as dispersion in ECO and ECOWAS regions converge to zero and they are experiencing same the competitiveness levels in the last year.

## 5. CONCLUSION

The main purpose of this study is to assess the feasibility of forming a monetary union among OIC countries. To this end, the paper focuses on economic competitiveness levels to test the optimality of a possible common currency union. As the recent experiences of Euro Area, the large differences of economic competitiveness through a monetary union will lead to imbalances throughout the area. The results show that real effective exchange rates have been undervalued in almost all of OIC regions within last decade; thus economic competitiveness in these regions has improved. The OIC regions experiences lightly different but co-moved and converged misalignments. The AEU region shows the smallest misalignment and the ECOWAS, WAEMU, GCC, and UDEAC regions experience high but roughly co-moved misalignments. The ECO and D8 countries have the similar pattern of misalignments. In addition, the differences in misalignment levels have been severely reduced within the last decade. Stronger positive relationships exist between the exchange rate misalignments in two pairs of AEU-AMU regions and ECO-D8 regions. Results of sigma-convergence analyses show that the misalignments in the whole set of OIC regions are not persistent and the standard deviations of exchange rate misalignments have reduced over the last decade on average for all regions. It means that the competitiveness differentials have diminished through OIC regions within the last decade. The GCC, UDEAC and WAEMU regions have the lowest dispersion in misalignments; hence competitiveness levels among these three regions are strongly converged. In summary, although most of the regions experience diminishing competitiveness differentials and there is an obvious convergence between economic competitiveness in OIC regions, the

AEU region seems the most appropriate region satisfying the preliminaries of forming a common currency bloc.

## ACKNOWLEDGEMENT

The authors are grateful to Professor Claudio Morana for suggestions and comments on a previous version of this paper.

## NOTE

This paper was extracted from a PhD thesis by authors at University of Tabriz, Tabriz, Iran.

## ENDNOTES

1. For example, the Malaysian state of Kelantan launched the idea of gold Dinar and silver Dirham in the world of Islam. This idea is seriously supported by Islamists of Turkey. The African Union has followed the idea of a single continental currency. Five West African countries (Nigeria, Ghana, Guinea, Sierra Leone, and The Gambia) are close to establishing a monetary union. ECOWAS and WAMS countries of OIC are widely searching for the ways to ease the process of monetary integration among them. The six members of the Gulf Cooperation Countries (GCC) are planning to establish a common currency pegged to the U.S. dollar. However new political irritations among Qatar and other GCC countries may threaten their political integration and constrain their power to reach monetary integration.

2. See for example: Sturm and Siegfried (2005), Sahin (2006), Tsangarides and Qureshi (2008), Mohd Amin and Hamid (2009), Ihsanoglu (2009), Hassan, Sanchez, and Ershad (2010), Lee (2011), Lee and Azali (2012), Couhard, Coulibaly, and Oliver (2013), Elbadawi, Kaltani, and Rainmundo (2013) among the others.

3. These macroeconomic variables mainly consist of: the size of economy, terms of trade, openness, government expenditures, product diversifications and so on.

4. For more information about the link between competitiveness differential and monetary union refer to for example: Hallwirth (2015), Cid Brunet (2013) and Uxo, Paul, and Febrero (2011).

5. In order to estimate the model, this study also applied two other methods of FMOLS and DOLS. The results were not found different from PMG results.

6. The regional misalignment is calculated as the weighted mean of members' misalignments where the weights are the contribution of each country to total real GDP of the corresponding region.

7. In according to the results, the variables were I (0) and I (1).

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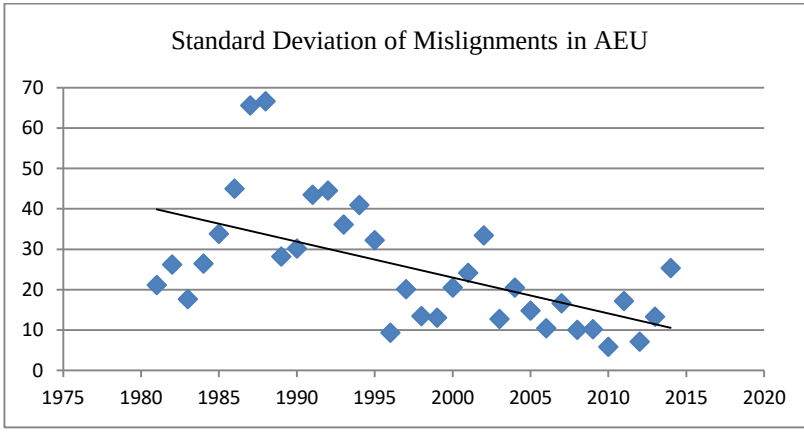
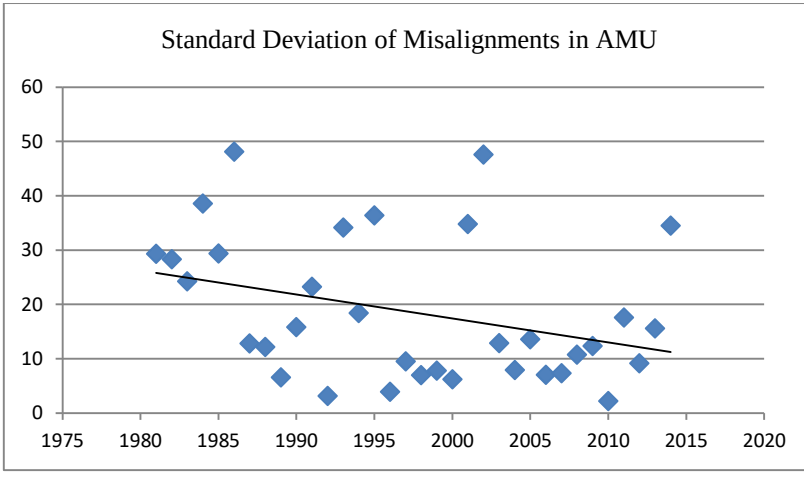
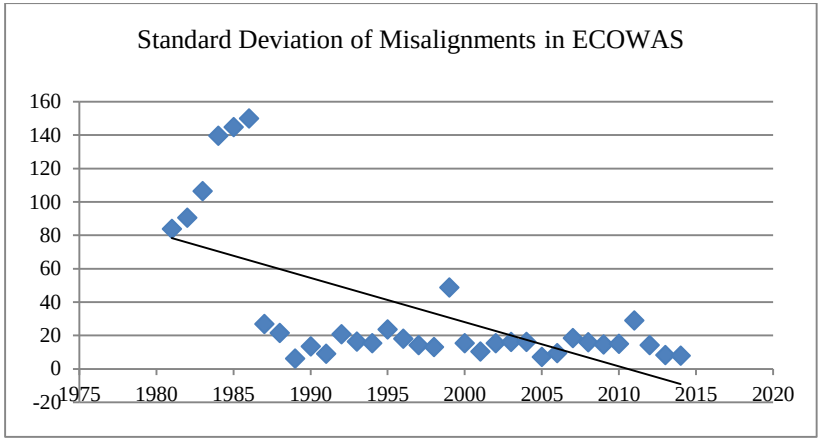
## APPENDIX




Standard Deviation of Misalignments in ECOWAS
160
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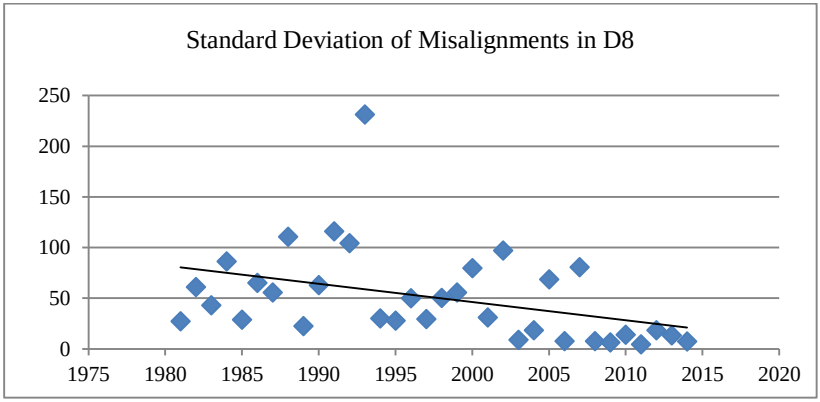
Standard Deviation of Misalignments in D8
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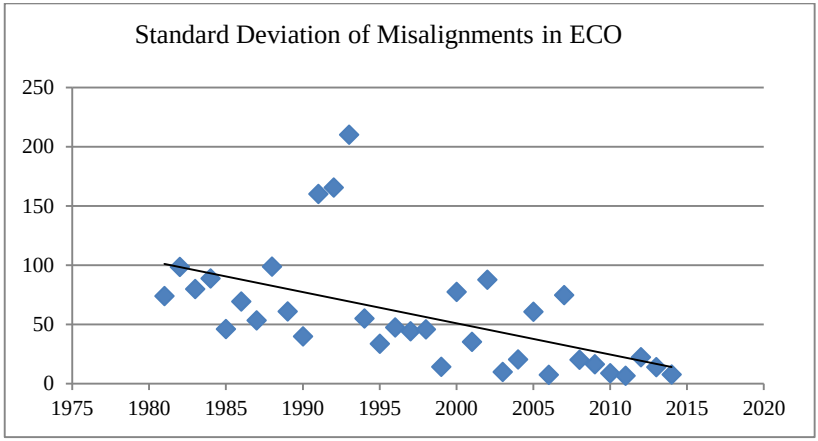
Standard Deviation of Misalignments in ECO
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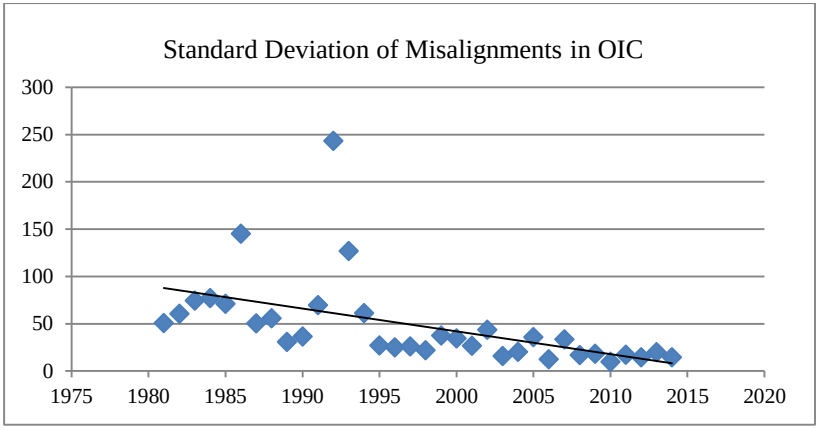
Standard Deviation of Misalignments in OIC
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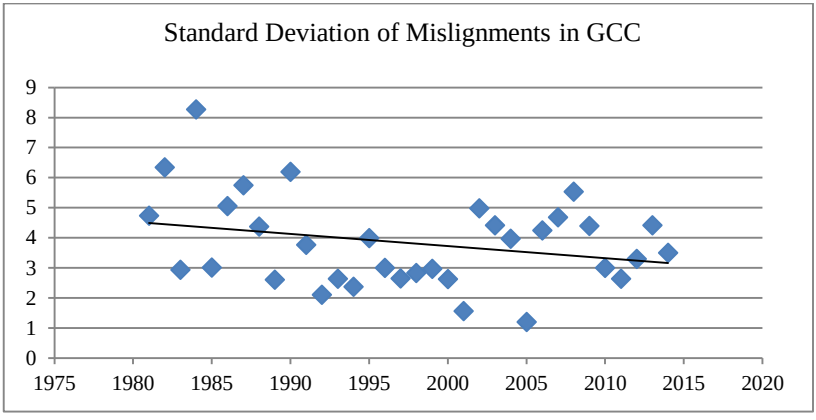
Standard Deviation of Mislignments in GCC
9
8
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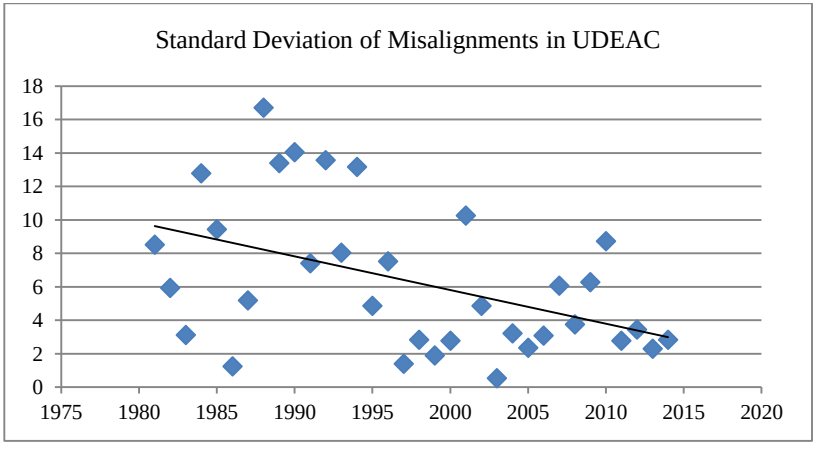
Standard Deviation of Misalignments in UDEAC
18
16
14
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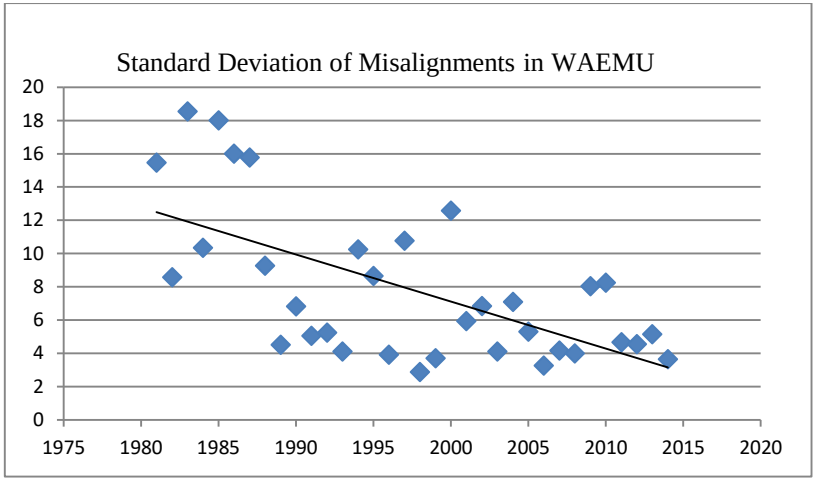
Standard Deviation of Misalignments in WAEMU
20
18
16
14
12
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2005
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