Paper Proceeding of the 5th Islamic Economics System Conference (iECONS 2013), "Sustainable Development Through The Islamic Economics System",
Organized By Faculty Economics And Muamalat, Universiti Sains Islam Malaysia, Berjaya Times Square Hotel, Kuala Lumpur, 4-5th September 2013.

CURRENCY CONUNDRUM AND INTRA-OIC TRADE: THE CASE OF MUSLIM ECONOMIES IN EAST AFRICA

Mohamed Ibrahim Nor[1]
Tajul Ariffin Masron[2]

ABSTRACT

American dollar has been used for decades as a medium of international trade exchange but the adverse effects of using the dollar is increasing over time as it is valued differently in different countries. The purpose of this study is to examine the effect of using the dollar as a medium of trade exchange among the economies in the Muslim world. While modeling the prices of goods traded among Muslim countries, the study found that adoption of US dollar as a medium of trade exchange among OIC economies poses a considerable currency conundrum, which affects both exporting and importing economies adversely. The results of this study imply that OIC will face difficulties to achieve its target of strengthening intra Islamic economic and trade cooperation as long as the dollar remains the medium of trade exchange among its economies.

Keywords: OIC economies, conundrum, prices of goods, medium of trade exchange

1. INTRODUCTION

To enhance trade amongst the Muslim world, many programs have been implemented by Organization of Islamic Cooperation (OIC). These programs range from research, training, raising awareness, and bringing traders and policy makers together to discuss on this matter. Though a significant contribution has been made by OIC to improve the trade among OIC member states, trade statistics illustrate the volume of intra-OIC trade (export and import) remains very small.

Apart from common challenges of production such as access to skilled human capital and suitable infrastructure, trade among OIC member states is suffering from lack of efficient and stable medium of exchange. US dollar is used as a medium of trade exchange among OIC member states but neither exporters nor importers use this currency in their local market. As most of OIC member countries use a floating exchange rate regime, the bilateral exchange rate between their local currencies and the US dollar fluctuates overtime. According to Robert Mundell, the 1999 Nobel Prize winner for Economics, exchange rate is the single factor that could lead to the collapse of a country (Chwialkowska, July 25, 1998). One of the main objectives of a foreign exchange market is to support the real sector by providing stable currency exchange services for traders and business people. In order for currency exchange markets in the Muslim world to be supportive to the intra-OIC trade, it has to be stable in a way that traders can manage their exchange rate risk and hedge the potential losses of their business. Without stable currency, national trade will suffer and export oriented businesses will not be able to effectively operate and efficiently compete in the global market.

In the context of OIC member states in East Africa, traders have been suffering from exchange rate risk due to the multiple currencies used to run their trade and the volatility of the local foreign exchange markets. Traders in these counties are not only worried about volatilities of their currencies but also

[1] School of Management, Universiti Sains Malaysia, 11800 USM, Penang, Malaysia. Corresponding author: fachay@gmail.com
[2] School of Management, Universiti Sains Malaysia, 11800 USM, Penang, Malaysia

volatilities of the currencies of their trading partners (OIC member states). As the currencies of the states in OIC such as Bangladesh, Pakistan, Turkey, Malaysia, and Indonesia are not actively traded in the markets of the OIC member states in East Africa, traders in low income OIC countries such as Somalia, Sudan, Djibouti, and Uganda use the US dollar to facilitate their trade. Since US dollar is used to facilitate intra-OIC trade, the volatility of US dollar is an essential determinant of the prices of goods imported from OIC member states.

Alternatively, despite the domestically-driven inflation, there is an imported inflation in OIC-East African states, which is more destructive to the economy and to the purchasing power of the people particularly poor and low-income households. This imported inflation is classified into two kinds; dollar-imported inflation and trade-imported inflation. While dollar-imported inflation is inherent in the use of US dollar, trade-based inflation is the inflation incorporated in the imported goods. However, both of them contribute to the deterioration of the local purchasing power.

Trade in OIC member states in East Africa has been suffering from immature and volatile foreign exchange markets. And since neither the exporter nor the importer's currency is accepted by both parties, the use of US dollar as a medium of exchange of the trade among OIC member states has become dominant. As different currencies are involved in each transaction, intra-OIC traders are enforced to consider changes in the markets of their trading partners as well as the changes in the US dollar. As Intra-OIC traders are exposed to these challenges, they are enforced to conceive different rates of inflation at once. This currency conundrum might be one of the reasons behind the poor performance of intra-OIC trade. The purpose of this paper is to examine the impact of using US dollar as a medium of trade exchange among economies in the Muslim world. This study models such events and examines potential adverse effects of such events to OIC member states in East Africa.

2. REVIEW OF THE LITERATURE

Inflation has been a common issue in Africa for the past 20 years due to the excessive devaluation of local currencies. Inflation is generally defined as "devaluation of local currency" but some people do mix between inflation and the effect of inflation. Inflation is an outcome of an uncalculated human action which leads to a general price increase and at the same time to the weakening of the purchasing power of the people. According to Friedman (1977), *"Inflation is always and everywhere a monetary phenomenon"*. This means inflation occurs due to problems in monetary policies and there would be no inflation if there were no money (King, 2001). Though inflation is driven by monetary side miscalculations, its effect on financial sector is less than its effect on the real sector. When inflation hits the real sector, the purchasing power of the people erodes until people cannot make the ends meet. Whilst Milton Friedman's famous proposition about inflation has been challenged by some studies (Willard, Guinnane and Rosen, 1996; Smith and Smith, 1997; McCandless, 1996), Burdekin and Weidenmier (2000) has offered new proof that Friedman proposition is entirely correct. Friedman's proposition reveals that drastic change in the quantity of money leads to a similar drastic change in the price level.

The current global monetary crisis has negatively affected global foreign exchange markets through different channels. Nonetheless, the adverse effects of these crises on least developed countries (LDCs) is severe. Since foreign currency markets are essential for these countries, crisis in foreign exchange market is almost equal, to them, losing both domestic and international trade leading into critical economic situation. This critical economic condition might reach in some countries a level of human crisis where people cannot afford basic livelihoods. In addition to droughts and armed conflicts, increasing food prices is contributing to the massive humanitarian crisis in East African countries such as Somali, Djibouti, Ethiopia and Kenya (IRIN, July 2011)[3]. Since the fall down of the Bretten Woods systems in 1973, foreign exchange markets in general have been highly volatile (Arize, Osang, & Slottje, 2000).

[3] Retrieved June 19th 2013: http://www.irinnews.org/report/93142/kenya-somalia-drought-decimates-livestock-hits-incomes

Subsequent to the collapse of fixed exchange rates, a central question was how such dramatic paradigm shift affects the growth of international trade.

Inflation remained an active phenomenon in Africa for decades because of poor monetary policies that pushed the creation of an active parallel market in the continent. Even when African governments such as Ghana wanted to improve the quality of their national currencies, they could not do it because of the existence of an active parallel market as prices quickly adjust in the parallel exchange rate (Chhibber & Shafik, 1990). Apart from local inflation, Africa is suffering from intra-and inter-continental transmission of inflation. Whilst measuring the intra-and inter-continental transmission of inflation in Africa, Jeong, Philip Fanara, and Charlier E. Mahone (2002), reported that USA is the leading producer of inter-continental inflation in Africa.

To reduce the level of inflation, some researchers have proposed the use of common currency that can at least contribute to the stability of prices of the goods traded among the countries in the same monetary area. Though it has been emphasized on establishing a currency union among trading partners to reduce adverse effects of using foreign currencies such as US dollar in their bilateral trade, researchers are in different opinion. While using data from over 200 countries, Glick and Rose (2002) found that countries left currency unions experience significant declines in bilateral trade economically and statistically. Moreover, Glick and Rose (2002) found that there is an economically and statistically significant effect of currency union on trade and their estimates indicate that bilateral trade increases when a pair of countries form a currency union. According to (Masron & Yusop, 2009), while the economic integration of ASEAN countries is anticipated to come up with a positive results, the integration can be strengthened through monetary integration. For them, having a common medium of exchange is important to facilitate bilateral trade in ASEAN countries.

Organization of Islamic Conference (OIC) was established in 1969 with the aim of ensuring and protecting the interest of the Muslim world in the spirit of promoting international peace and harmony. In 2011, the organization changed its name from Organization of Islamic Conference (OIC) to Organization of Islamic Cooperation (OIC). OIC is a strong organization as it's the collective voice of the Muslim world and has a permanent delegation to the United Nations (UN). Regarding to the economic interest of the Muslim world, OIC established several frameworks to strengthen intra Islamic economic and trade cooperation (Kusuma, 2010). This economic and trade cooperation is expected to facilitate the establishment of an Islamic common market. The Protocol on the Preferential Tariff Scheme (PRETAS) is among these frameworks and this is instituted to reduce trade restrictions among member states to ultimately promote trade and growth (Kusuma, 2010).

Though OIC has been trying to improve the intra-OIC trade, trade among Muslim world is not as anticipated. Even OIC countries in Gulf Cooperation Council (GCC) did not achieved their unified economic policy as the intra-regional trade among these countries (United Arab Emirates, Bahrain, Saudi Arabia, Oman, Qatar and Kuwait) is still at a modest level (Sahib & Kari, 2012). On the other hand, Ahamat (2009) found that intra-OIC trade still remains low in terms of its volume and its proportion (compared to other trade systems). Moreover, Ahamat (2009) identified that intra-OIC trade is concentrated in few OIC countries and in certain types of products. As shown in table 1, the average intra-OIC trade needs to be revolutionalized to increase trade among OIC member states. Apart from Djibouti and Somalia, the intra-OIC trade of the sample countries is less than 30%. Indonesia, Malaysia, Bangladesh, UAE and Uganda have the lowest trade (export and import) with OIC member states. More interestingly, Somalia and Djibouti have the highest percentage in Intra-OIC exports (80% and 73% respectively) but have less than 30% of intra-OIC imports.

Table 1: Intra-OIC Trade (1970-2011)

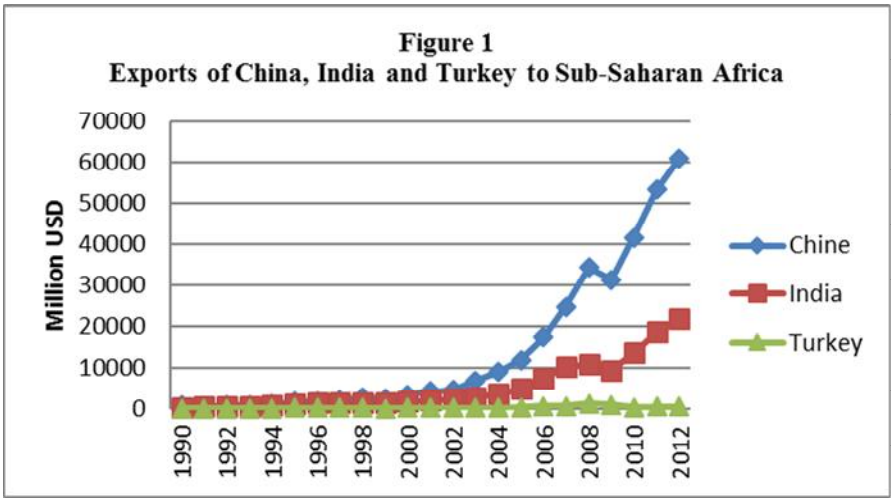
No.	Country	Geographical Zone	Export (% Mean)	Imports (% Mean)	Trade (% Mean)
1	Bangladesh	South Asia	14	14	14.0
2	Djibouti	East Africa	73	21	***47.0***
3	Indonesia	South East Asia	6	9	7.5
4	Malaysia	South East Asia	6	7	6.5
5	Oman	Middle East and North Africa	20	30	25.0
6	Pakistan	South Asia	26	30	28.0
7	Somalia	East Africa	80	28	***54.0***
8	Sudan	East Africa	21	26	23.5
9	Turkey	Europe	22	18	20.0
10	Uganda	East Africa	7	8	7.5
11	UAE	Middle East and North Africa	15	13	14.0

Source: SESRIC

The trade and investment competition in low-income countries such as East African countries has increased due to the interest of the emerging economies such as China and India to these countries. The link between China and Sub-Saharan Africa has been growing rapidly in trade, investment and aid and Chinese involvement in Africa is driven primarily by the quest for material inputs necessary for Chinese infrastructure investments and flourishing manufacturing sector (Kaplinsky, McCormick, & Morris, 2007). Likewise, India has remained interested in Africa and its involvement in West Africa has increased drastically due to India's fierce competition from the West and other countries to secure West Africa resources (Singh, 2007). Apart from securing resources in Africa, India wants to make West Africa one of its long-term energy sources. Though India's quest for energy in West Africa is not currently a principal component, India invests in these countries as one of its bid to diversify energy sources (Singh, 2007).

Apart from China and India, Turkey is strongly striving to position itself in Africa. Turkey is taking part in the competition in Africa. Turkish relation with Africa has been evolving since 1998 and it has come as a passive attempt after Turkey decided to strengthen its links with Africa following Turkey-Africa Cooperation Summit (Ozkan, 2008). Though Turkey is trying to penetrate African markets, its exports to Sub-Saharan Africa are very small compared to China and India. See figure 1.

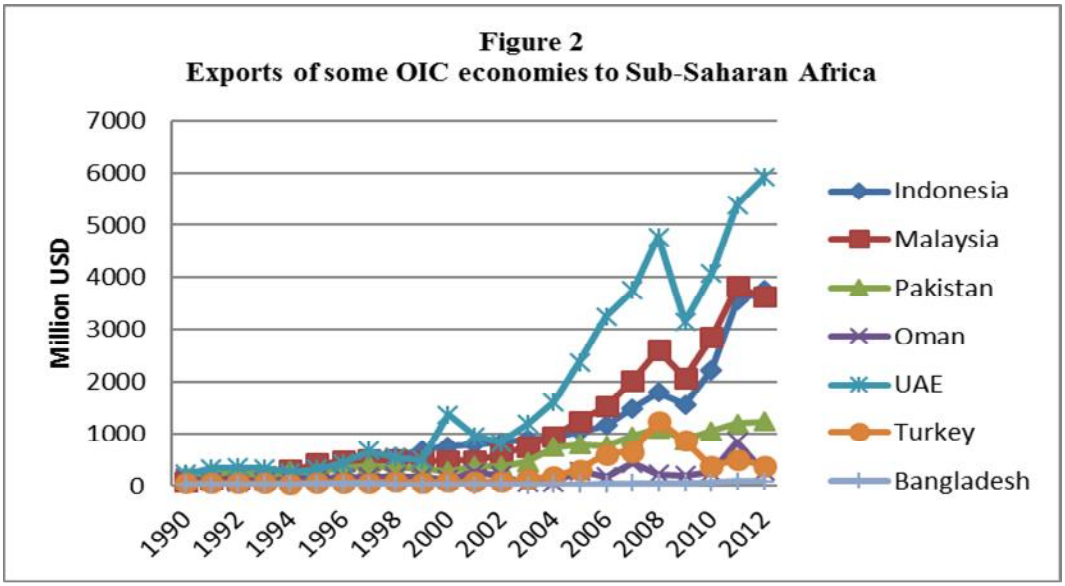
Figure 1
Exports of China, India and Turkey to Sub-Saharan Africa



Source: IMF - Direction of Trade Statistics

Since the interest of OIC countries such as Turkey is increasing drastically for the purpose of having Africa as a source of input and a profitable market, OIC member states should have their currencies traded in African foreign exchange markets. Because this could reduce the current currency conundrum among trade partners within OIC economies. Figure 2 depicts exports of OIC member states in Sub-Saharan Africa are increasing overtime.

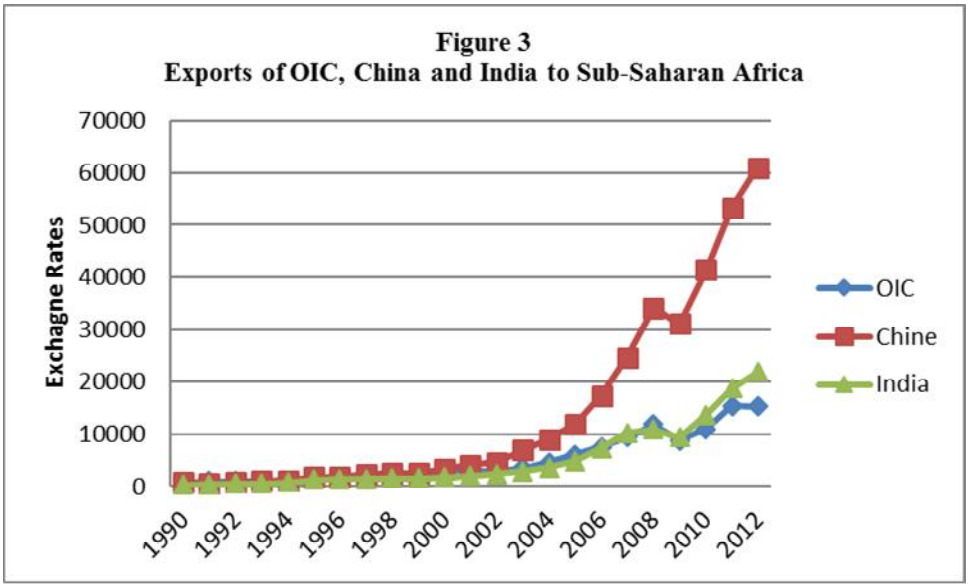
Figure 2
Exports of some OIC economies to Sub-Saharan Africa



Source: IMF - Direction of Trade Statistics

Despite the fact that exports of OIC member states to Sub-Saharan Africa are increasing but the volume of the exports is small compared to China and India. The volume of exports made by seven OIC exporting countries (Indonesia, Malaysia, Pakistan, Oman, UAE, Turkey, and Bangladesh) is less than the volume of exports made by China or India in the same period. See figure 3.

Figure 3
Exports of OIC, China and India to Sub-Saharan Africa



Source: IMF - Direction of Trade Statistics

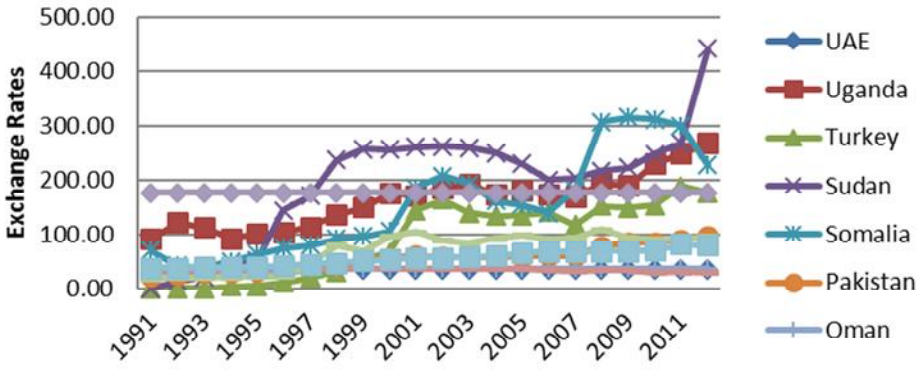
Due to the currency conundrum in OIC countries, the objectives of Islamic economic system that have been propagated by Islamic economists are coming under threat. Apart from other goals such as economic well-being and socio-economic justice, stability in the value of money is an indispensible goal in the Islamic economic system because of the unequivocal stress of Islam on honesty and fairness in all human dealings (Chapra, 1985). The increasing inflation in low-income OIC countries such as Somalia, Sudan, Uganda and Djibouti is not only contributing to the money erosion but also weakening the ability of OIC traders to compete in the global market. This will finally lead poor OIC member states not to achieve the other goals of Islamic economic system such as economic well-being and socio-economic justice.

Since money is a measure of value, any constant and significant erosion in its real value may be regarded as corrupting the world because of the adverse effect that this erosion will have on social justice and welfare (Chapra, 1985). One way to stabilize money is to ensure the stability of exchange rate markets because money is traded in this market. Having a sound monetary policy is fundamental for an exchange rate to be stable. According to Kaleem (2000), the ultimate goal of good monetary policy to achieve sustaining real economic growth, increase employment and minimize inflation. These targets can be accomplished under Islamic monetary system if suitable monetary instruments, which are in line with the teachings of Islam, are deployed (Kaleem, 2000).

As shown in figures 4, exchange rates of most of the OIC member states have fluctuates over time. Out of the seven Asian OIC countries, only two (UAE and Oman) have had a stable currency. However, the currency behavior of these two countries might not reflect the true value of the currency. On other hand, out of the four East African OIC member states, only Djibouti has had a stable currency. Nevertheless, this trend might not reflect the real value of Djibouti frank. The historical currency data indicate that currencies in OIC member states have been volatile over time. The volatility of exchange rates affects both the traders and consumers; thus, reducing the ability of traders to engage in business activities and limiting the capacity of consumers to purchase their needs.

Whilst an extensive body of theoretical and empirical literature has investigated the link between exchange rate uncertainty and international trade flows, neither the theoretical nor empirical studies provide an absolute answer (Baum & Caglayan, 2012). However, the general provision is that an increase in exchange rate volatility will have an adverse effect on trade flows and as a result the overall vitality of the global economy.

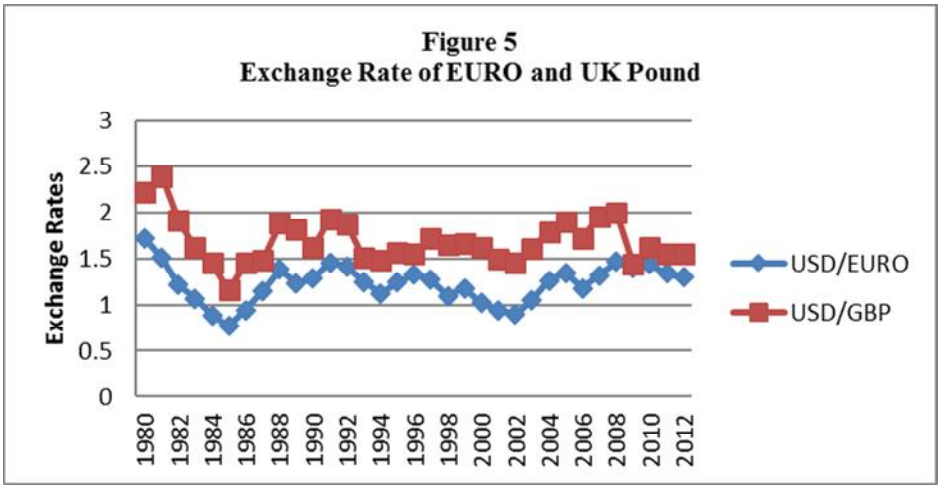
Figure 4
Exchagne Rates of Some OIC member States



Source: SESRIC

Due to immature currency markets in East African OIC countries, US dollar has been the most active foreign currency in these countries; thus, it has been used as a medium of trade exchange. Nonetheless, the US dollar itself is not free from fluctuation and it is also hit by the global economic events. As depicted in figure 5, the US dollar has been fluctuating against British Pound and EURO. Whilst US dollar is facing such fluctuations against other currencies, its adoption as a medium of trade exchange is yet to be challenged in East Africa OIC countries because the currencies of other OIC exporting countries such as Turkey, Pakistan, Malaysia, Indonesia, UAE, Oman and Bangladesh are not actively traded in East African markets.

Figure 5
Exchange Rate of EURO and UK Pound



Source: WM/Reuters

Though American currency (the dollar) has been using in East African OIC countries as a medium of trade exchange for decades, the use of US dollar to facilitate intra-OIC trade is threatening traders in East African OIC due to the volatility of the national and international currencies. Alternatively, traders in these countries (Djibouti, Somalia, Sudan, and Uganda) need to convert their national currencies into US dollar and then the US dollar into the national currency of their trading partner (Turkey, Bangladesh, Malaysia, Indonesia, Pakistan, Oman, and UAE). Consequently, East African traders are enforced to conceive several exchange rate fluctuations (inflations), which is not only disappointing these traders but also making OIC imported goods cannot compete in these markets. This paper examines the effect of such currency conundrum on the trade among Muslim world.

3. METHOD AND MATERIAL

The purpose of this study is to examine the effect of currency conundrum on intra-OIC trade. The study uses four East African OIC countries, namely, Djibouti, Somalia, Sudan and Uganda and seven of their OIC trading partners, namely, Bangladesh, Indonesia, Malaysia, Oman, Pakistan, Turkey and United Arab Emirates. The following are the basic assumptions of the study:

1. These seven countries are the trading partners of the four countries
2. Currencies of these seven countries are not actively traded in East Africa
3. Currencies of East African economies are not also traded in these seven countries
4. US dollar is used as a medium of trade exchange between these seven economies and East African OIC states
5. The availability of hedging service/facility is limited in East African OIC states

6. Cost of trade is constant (c)
7. Profit Rate is constant (p)
8. Risk reduction rate is also constant (e)

To comprehensively understand the effect of the currency conundrum an intra-OIC trade, the study simulates seven possible scenarios that can take place while importing goods from on OIC economy to East African OIC countries. East African traders, who are importing from an OIC member states must consider the following three factors:

1. Price of goods in the domestic markets of the OIC trading partner (OICTP)
2. The value of US dollar in the markets of the OIC trading partner
3. The value of US dollar in East African OIC markets.

If these three factors are taken into consideration, the basic pricing model for imported goods from OIC trading partners looks like the following:

$$\mathrm{Y}_{EAp} = \left[\frac{\mathrm{Y}_{OICp}}{S^{\$}_{OICc}} \times S^{\$}_{EAc} \right] + C + P + \varepsilon$$

where Y_{EAp} is the price of a good in the markets of East African OIC countries, Y_{OICp} is the price of a good in the markets of OIC trading partners, $S^{\$}_{OICc}$ is the exchange rate of a US dollar in the markets of OIC trading partners, $S^{\$}_{EAc}$ is the exchange rate of a US dollar in the markets of East African OIC member states, C is the cost of trade, P is the profit of trade and ε is the risk reduction amount.

Other things being equal, a change of a price of a good in East Africa ($\mathrm{Y}_{\mathrm{EAp}}$) is dependent on changes in the factors of the basic pricing model in equation 1. Changes in $\mathrm{Y}_{\mathrm{EAp}}$ can be expressed algebraically as follows:

$$\Delta\mathrm{Y}_{EAp} = \Delta\mathrm{Y}_{OICp} \div \Delta S^{\$}_{OICc} \times \Delta S^{\$}_{EAc} + C + P + \varepsilon$$

whereas Δ is the change that can happen in each factor. From our simulations, we have found the following seven changes that can occur while trading a good among OIC member states:

1. Change of the Prices of the goods in the markets of the trading partners

$$D^{OICc}_{lm} = \left[\frac{EP_{OICc} \div S^{\$}_{OICc}}{OP_{\$}} \right]$$

whereas D^{OICc}_{lm} is the changes of prices of the goods in the exporting economy, EP_{OICc} is the extra price that has to be paid by the local people, $S^{\$}_{OICc}$ is the Spot Rate of a US dollar in the market of OIC trading partner and $OP_{\$}$ is the Original price of the good in US dollar. While taking this change into consideration, there will be the following new pricing model:

$$\mathrm{Y}_{EAp} = \left[1 + \frac{EP_{OICc} \div S^{\$}_{OICc}}{OP_{\$}} \right] \times \left[\frac{\mathrm{Y}_{OICp} S^{\$}_{EAc}}{S^{\$}_{OICc}} \right] + C + P + \varepsilon$$

2. Change of the value of US dollar in the OIC trading partners' market (USD vs OIC currency)

$$D^{\$}_{OICc} = \left[\frac{S^{\$}_{-1} - S^{\$}_{0}}{S^{\$}_{0}} \right]$$

Whereas $D^{\$}_{OICc}$ is the devaluation of a US dollar in an OIC Currency, $S^{\$}_{-1}$ is the previous spot exchange rate of a US dollar in an OIC Currency and $S^{\$}_{0}$ is the current spot exchange rate of a US dollar in an OIC Currency. If this is considered, the new price will look like the following:

$$\mathrm{Y}_{EAp} = \left[1 + \frac{S^{\$}_{-1} - S^{\$}_{0}}{S^{\$}_{0}} \right] \times \left[\frac{\mathrm{Y}_{OICp} S^{\$}_{EAc}}{S^{\$}_{OICc}} \right] + C + P + \varepsilon$$

3. Change of the value of the US dollar in East African OIC states (USD vs East African Currency)

$$D^{\$}_{EAc} = \left[\frac{S^{\$}_{0} - S^{\$}_{-1}}{S^{\$}_{-1}} \right]$$

Whereas $D^{\$}_{EAc}$ is the devaluation of an East African currency against US dollar. After considering this, the new pricing model can be expressed as follows:

$$\mathrm{Y}_{EAp} = \left[1 + \frac{S^{\$}_{0} - S^{\$}_{-1}}{S^{\$}_{-1}} \right] \times \left[\frac{\mathrm{Y}_{OICp} S^{\$}_{EAc}}{S^{\$}_{OICc}} \right] + C + P + \varepsilon$$

4. Change of Prices of the goods and value of US dollar in the exporter's market simultaneously

$$D^{OICc}_{lm} + D^{\$}_{OICc} = \left[\frac{EP_{OICc} \div S^{\$}_{OICc}}{OP_{\$}} \right] + \left[\frac{S^{\$}_{-1} - S^{\$}_{0}}{S^{\$}_{0}} \right]$$

If this event happens, the new pricing model can be expressed as follows:

$$\mathrm{Y}_{EAp} = \left[\left(\frac{EP_{OICc} \div S^{\$}_{OICc}}{OP_{\$}} \right) \times \Delta S^{\$}_{OICc} + \left(\frac{S^{\$}_{-1} - S^{\$}_{0}}{S^{\$}_{0}} \right) \right] \times \left[\frac{\mathrm{Y}_{OICp} S^{\$}_{EAc}}{S^{\$}_{OICc}} \right] + C + P + \varepsilon$$

Whereas $\Delta S^{\$}_{OICc} = \frac{S_{-1}}{S_{0}}$.

5. Change of Prices in exporter's market and value of US dollar in East African markets concurrently

$$D^{OICc}_{lm} + D^{\$}_{EAc} = \left[\frac{EP_{OICc} \div S^{\$}_{OICc}}{OP_{\$}} \right] \times \left[\Delta S^{\$}_{EAc} \right] + \left[\frac{S^{\$}_{0} - S^{\$}_{-1}}{S^{\$}_{-1}} \right]$$

Whereas $\Delta S^{\$}_{EAc} = \frac{S_{0}}{S_{-1}}$.

If these changes are incorporated into the price, the pricing model will be as follows:

$$Y_{EAc} = \left[\left(\frac{EP_{OICc} \div S^{\$}_{OICc}}{OP_{\$}}\right) \times \left(\Delta S^{\$}_{EAc}\right) + \left(\frac{S^{\$}_{0} - S^{\$}_{-1}}{S^{\$}_{-1}}\right) + 1\right] \times \left[\frac{Y_{OICp} S^{\$}_{EAc}}{S^{\$}_{OICc}}\right] + C + P + \varepsilon$$

6. Change of the value of US dollar in exporter's market and East African markets simultaneously

$$D^{\$}_{OICc} + D^{\$}_{EAc} = \left[\frac{S^{\$}_{-1} - S^{\$}_{0}}{S^{\$}_{0}}\right] \times \left[\Delta S^{\$}_{EAc}\right] + \left[\frac{S^{\$}_{0} - S^{\$}_{-1}}{S^{\$}_{-1}}\right]$$

While considering these changes, the new price can be expressed as follows:

$$Y_{EAp} = \left[\left(\frac{S^{\$}_{-1} - S^{\$}_{0}}{S^{\$}_{0}}\right) \times \left(\Delta S^{\$}_{EAc}\right) + \left(\frac{S^{\$}_{0} - S^{S}_{-1}}{S^{\$}_{-1}}\right) + 1\right] \times \left[\frac{Y_{OICp} S^{\$}_{EAc}}{S^{\$}_{OICc}}\right] + C + P + \varepsilon$$

7. Change of all factors concurrently (prices, value of US dollar in both market)

$$D^{\$}_{OICc} + D^{OICc}_{lm} + D^{\$}_{EAc} = \left[\left(\frac{S^{\$}_{-1} - S^{\$}_{0}}{S^{\$}_{0}}\right) \times \left(\Delta S^{\$}_{EAc}\right)\right] + \left[\left(\frac{EP_{OICc} \div S^{\$}_{OICc}}{OP_{\$}}\right) \times \left(\Delta S^{\$}_{EAc} + \Delta S^{\$}_{OICc}\right)\right] + \left[\frac{S^{\$}_{0} - S^{\$}_{-1}}{S^{\$}_{-1}}\right]$$

After considering changes in the three factors, the new price can be modeled as follows:

$$Y_{EAp} = \left\{\left[\left(\frac{S^{\$}_{-1} - S^{0}_{0}}{S^{\$}_{0}}\right) \times \left(\Delta S^{\$}_{EAc}\right)\right] + \left[\left(\frac{EP_{OICc} \div S^{\$}_{OICc}}{OP_{\$}}\right) \times \left(\Delta S^{\$}_{EAc} + \Delta S^{\$}_{OICc}\right)\right] + \left[\frac{S^{\$}_{0} - S^{\$}_{-1}}{S^{\$}_{-1}}\right] + 1\right\} \times \left[\frac{Y_{OICp} S^{\$}_{EAc}}{S^{\$}_{OICc}}\right] + C + P + \varepsilon$$

4. RESULTS AND DISCUSSION

4.1 Results

Whiling using the pricing models developed in the methodology section, the results of all possible scenarios are reported here. In the hypothesized findings, a good is assumed to be imported from OIC exporting economies to East African OIC countries. If the seven potential scenarios are employed to incorporate the potential changes of the three factors, the following price change will take place. This is based on the assumption that goods are imported from an OIC exporting economies whose national currency is different from US dollar. While assuming hypothetical good, this paper assumes that one unit of good is traded between OICc1800 and OICc2000 depending on the exporter's domestic market. On the other hand, $1 is traded between OICc38 to OICc28 depending on the historical rates of exporter's foreign exchange market, while $1 is traded between AEc12,000 to EAc34,000 on the basis of East Africa's historical exchange rates. This scenario analysis is based on an assumption that traders from East Africa continue importing goods from their OIC trading partners regardless of changes in commodity and currency markets. For this analysis, the cost, profit and risk reduction rates are ignored.

4.1.1 Normal Situation: Original Price

Other things being equal, the price of the hypothesized good will be in OIC East African countries about **568,421** in East African currency. In terms of US dollar, this price is equivalent to **$47.37**.

$$Y_{EAp} = \left[\frac{1800}{38} \times 1200\right] = EAc568{,}421$$

4.1.2 Scenario I: Change of the Price of the OICTP Goods (from 1800 to 2000)

While assuming the basic prices have changed in exporter's local market, East African traders will be affected by this change and it will be incorporated in East African local markets. This change is captured in the following pricing model:

$$Y_{EAp} = \left[1 + \frac{200 \div 38}{47.37}\right] \times \left[\frac{1800}{38} \times 12000\right] = EAc631{,}579$$

As shown in the above model, the price will be **631,579** of OIC currency, which is equal to **$52.63.** Analytically, OICTP local consumers will pay OICc2000 (11%) whereas the price of the same product in East Africa will also go up by the same percentage (11%) due to the price changes in the original/source market. Assuming a constant exchange rate, it can be inferred from the analysis that the 11% price increase affects all economies that import from these countries, thus, everyone will pay the additional price rise. This concludes that the price rise in an exporting country will be imported to all of its trading partners.

4.1.3 Scenario II: Change of the value of US dollar in the Exporter's market

In the second scenario, the value of US dollar changes in the market of the OIC exporters. This change will affect the pricing model in East Africa as the change is incorporated. As shown in the model below, the new price will be **771,429** and **$64.29** East African and US currencies respectively.

$$Y_{EAp} = \left[1 + \frac{38 - 28}{28}\right] \times \left[\frac{1800}{38} \times 12000\right] = EAc771{,}429$$

Mathematically, East Africans will pay 36% additional to the price paid by the people in OIC exporters. This happens when the value of dollar devaluates against OIC exporters' currency. Furthermore, while the value of a US dollar in East Africa remains the same, East African consumers pay more due to the usage of US dollar as a medium of trade exchange. This implies the inflation of the US dollar is imported into East African OIC states even if the price of goods and currencies in OIC states are stable.

4.1.4 Scenario III: Change of East African Currency

This scenario assumes the value of US dollar is changed in East African OIC states from 12000 to 34000. If such scenario takes place, the new price will be **EAc1,610,526** with an equivalent to **$47.37**.

$$Y_{EAp} = \left[1 + \frac{34000 - 12000}{12000}\right] \times \left[\frac{1800}{38} \times 12000\right] = EAc1{,}610{,}526$$

As shown in model 4, the price of the imported goods will change due to devaluation of East African currency against US dollar. The price of the imported goods will go up in East Africa by 183%, while its price remains the same in the exporter's Market. East African consumers are facing this challenge due to the devaluation of their domestic currency.

4.1.5 Scenario IV: Change of Prices and value of USD in Exporter's market simultaneously

In this scenario, two factors are assumed to be changing simultaneously. The price of the hypothesized good changed from 1800 to 2000 and the value of US dollar changed from 38 to 28. If prices of the goods

and value of US dollar happen to change concurrently in the exporter's market, the price of the imported goods in East Africa is anticipated to be about 857,143 East African currency, which is similar to $71.43.

$$Y_{EAp} = \left[\left(\frac{200 \div 38}{47.37}\right) \times \frac{38}{28} + \left(\frac{38-28}{28}\right) + 1\right] \times \left[\frac{1800}{38} \times 12000\right] = EAc857{,}143$$

Both the value of US dollar and price of goods have changed in exporter's market but the value of US dollar in East Africa remains the same. In this case, East Africans have to pay 51% extra price due to two effects: domestic price and exchange rate changes. Despite the fact that the price increase in exporter's domestic market is only limited to 11%, the price increased in East Africa by 51% due to the usage of US dollar as a medium of trade exchange.

4.1.6 Scenario V: Change of Prices in the Exporter's Market and value of USD in East African

If the price of the hypothesized good changes in the exporter's market from 1800 to 2000 and the value of US dollar changes in the East African markets, the new price will be **EAc1,789,474** with an equivalent USD of $**52.63**.

$$Y_{EAc} = \left[\left(\frac{200 \div 38}{47.37}\right) \times \left(\frac{34000}{12000}\right) + \left(\frac{34000-12000}{12000}\right) + 1\right] \times \left[\frac{1800}{38} \times 12000\right] = EAc1{,}789{,}474$$

After having assumed that East African traders will observe these changes, the price of the imported goods will go up in Africa by 215% while there is only 17% price increase in the exporter's market. This drastic change is driven by the drastic change in the value of USD in East Africa.

4.1.7 Scenario VI: Change of the value of USD in Exporter's Market and East Africa

Assuming the value of the US dollar changes in exporter's market from 38 to 28 and in East African market from 12000 to 34000, the new price is expected to be **EAc2,185,714**, which is similar to **$64.29**.

$$Y_{EAp} = \left[\left(\frac{38-28}{28}\right) \times \left(\frac{34000}{12000}\right) + \left(\frac{34000-12000}{12000}\right) + 1\right] \times \left[\frac{1800}{38} \times 12000\right] = EAc2{,}185{,}714$$

If the value of the dollar changes in the two markets, the pricing model will change and the new price for the same product will change. Due to this change, consumers in East African will pay 285% additional money. More interestingly, African people pay 285% additional money on the same product, while its price remains unchanged in exporter's markets. Thus, the use of US dollar as a medium of exchange is causing such drastic changes to the intra-OIC trade.

4.1.8 Scenario VII: Change of all factors (price, value of USD in OICTP and East Africa)

This scenario simulates a case in which the three factors change. Price of the goods change from 1800 to 2000, value of US dollar changes in the exporter's market from 38 to 28, and the value of US dollar change in East Africa from 12000 to 34000. If such changes takes place, the new price will be **EAc2,428,571**, which is equal to **$71.43**.

$$Y_{EAp} = \left\{\left[\left(\frac{38-28}{28}\right) \times \left(\frac{34000}{12000}\right)\right] + \left[\left(\frac{200 \div 38}{47.37}\right) \times \left(\frac{34000}{12000} + \frac{28}{38}\right)\right] + \left[\frac{34000-12000}{12000}\right] + 1\right\} \times \left[\frac{1800}{38} \times 12000\right] \pm 3\% = EAc2{,}428{,}571$$

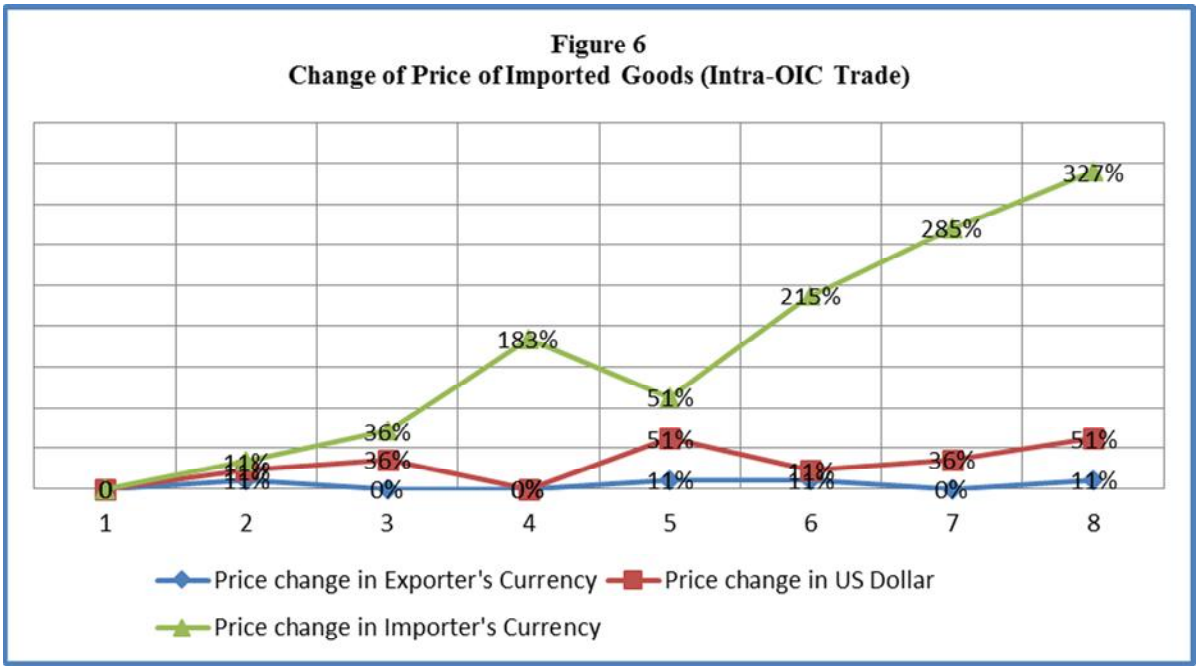
If the changes of all factors are considered, the price of the product will change in East African markets. Due to changes in both East African markets as well as the exporter's market, the price increases from

568,421 to **2,428,571**(327%). Apart from 11% that is caused by the exporter's domestic inflation, the remaining 316% is caused by the fluctuation of the US dollar. It can be argued that East African consumers are victimized because they are using US dollar as a medium of trade exchange.

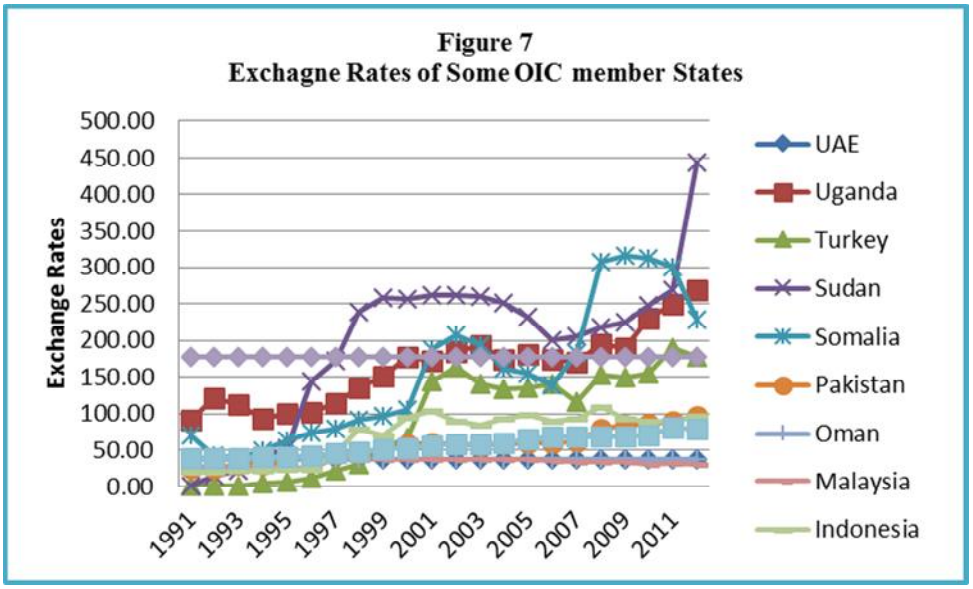
4.2 Discussion

As shown in the hypothesized results of the pricing model developed in this study, it is obvious that prices of goods imported from OIC trading partners to East Africa might go up without any price increase that takes place in the source market. After having analyzed the seven scenarios, the study found the following imperative results: firstly, due to exchange rate fluctuation, prices of goods imported from OIC trading partners rise in East African markets while the prices of the same goods are stable in the exporter's market. Secondly, prices of goods imported from OIC trading partners will go up in East Africa if the prices of the same goods increase in the exporter's domestic market. The price rise observed in exporter's market and imported to East Africa can come from a local economic shock or an external shock that is transmitted to the exporter's market by international markets. Thirdly, the study identified that prices of goods traded within OIC member states may change due to a change in the value of US dollar in the exporter's market. Again, this change can take place due to an economic strength recorded in the exporter's domestic economy or a general depreciation facing the US dollar worldwide. Fourthly, this study argues that prices of goods traded within Muslim world may increase due to changes that are taking place in importer's market. For example, the value of US dollar may change in Somalia or Uganda due to either domestic factors or externally transmitted factors.

Figure 6 shows that prices of goods imported from OIC trading partners can extremely go up in East African OIC states indicating that prices in these markets do not follow all times the prices of its trading partners. This is due to the use of US dollar as a medium of trade exchange. In the seventh scenario, the price of good increases in East Africa by 285%, while it is price is unchanged in the exporter's market. If the three factors happen to change, the price will go up in the importer's market by 327% and in the exporter's market by only 11% because US dollar do not determine the domestic prices of the exporter's market. Due to exchange rate mismatches, prices do not go down in East Africa when it's going down in the exporter's market.



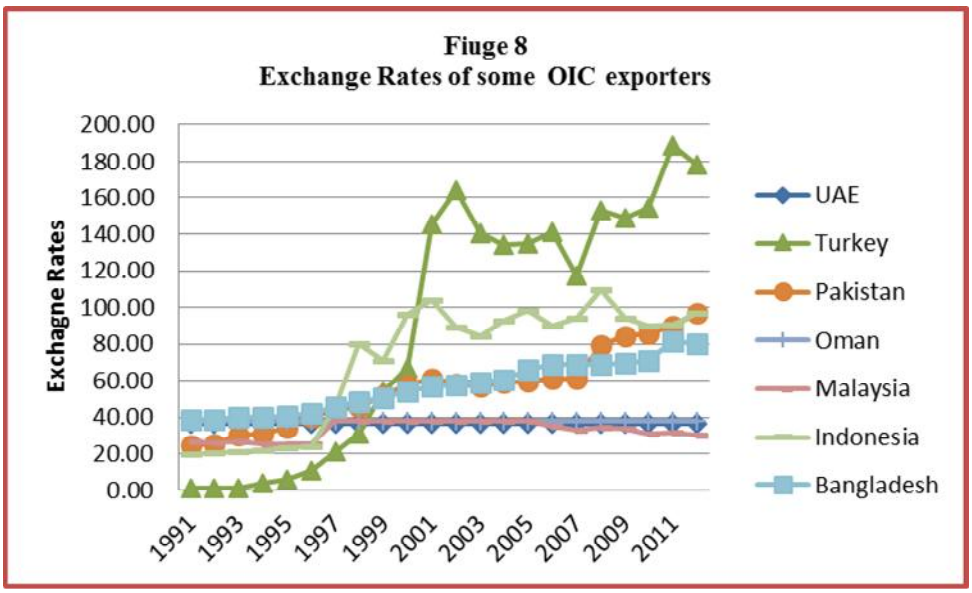
As figure 7 shows there is an exchange rate mismatch among OIC member states, which indicates there is no comovement between exchange rates of OIC states and its trading partners. This is another important phenomenon as this exacerbates the case of using US dollar as a medium of trade exchange. It is observed that sometimes East African currencies (such as Somali shilling) are losing against USD while the currencies of its trading partners are gaining against USD leading into more price increase in the local market. Alternatively, such events are making OIC goods less competitive in East African markets.



Source: SESRIC

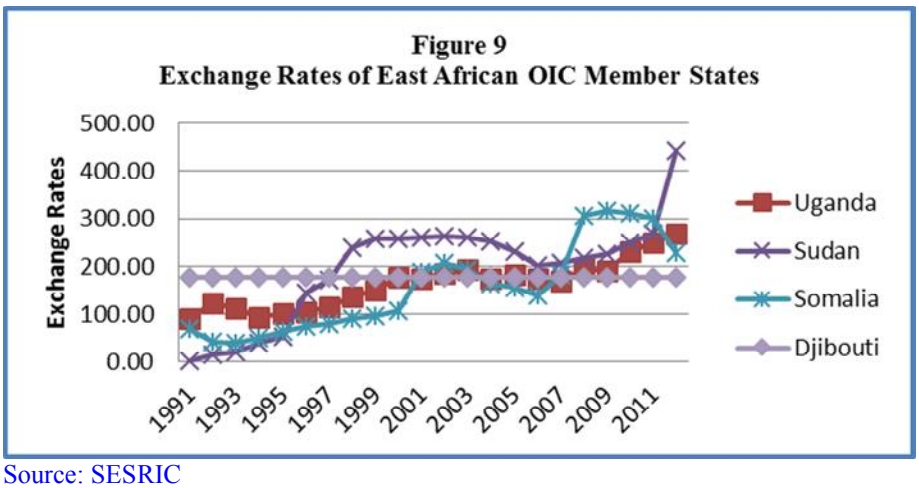
On the other hand, figure 8 indicates that currencies in OIC exporting economies are not commoving and each currency behaves on its own pattern. This also shows that goods imported from these countries will have different prices in East Africa if such trend persists. The trend of the currencies of these countries

points out that trade within these economies will also suffer from the same currency conundrum as long as US dollar is used as a medium of trade exchange. Nevertheless, the trend of currencies in OIC exporting economies illustrate that using US dollar as a medium of exchange in intra-OIC is not contributing to the strategies of OIC and to the objectives of an Islamic economic system.



Source: SESRIC

Equally, currencies in East Africa OIC states are valued in US dollar differently. As shown in figure 9, except for Djibouti, East African OIC currencies do not commove; thus, goods imported from an OIC trading partner is priced different in every country depending on the volatility of domestic currency against US dollar. This implies that trade within East African OIC economies is also suffering from currency conundrum because the value of US different differs among these countries.

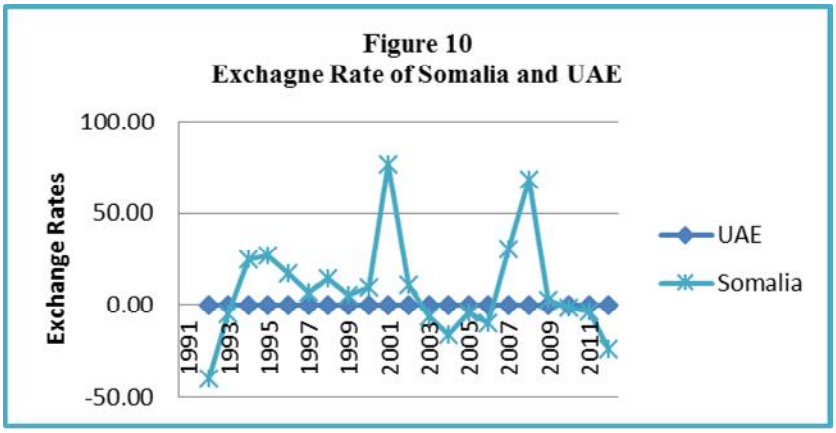


Source: SESRIC

Someone may argue that the assumptions of this paper are not realistic as it is assuming something that is oddly happen. Nevertheless, the available historical data shows that the assumptions of this paper are not unrealistic. The real data shows that value of US dollar is changing in the exporting economy, whereas the same change is not followed by importing economy and the opposite is true. Figure 10 shows that the value of US dollar in Somali behaves different from the value of US dollar in United Arab Emirates (one

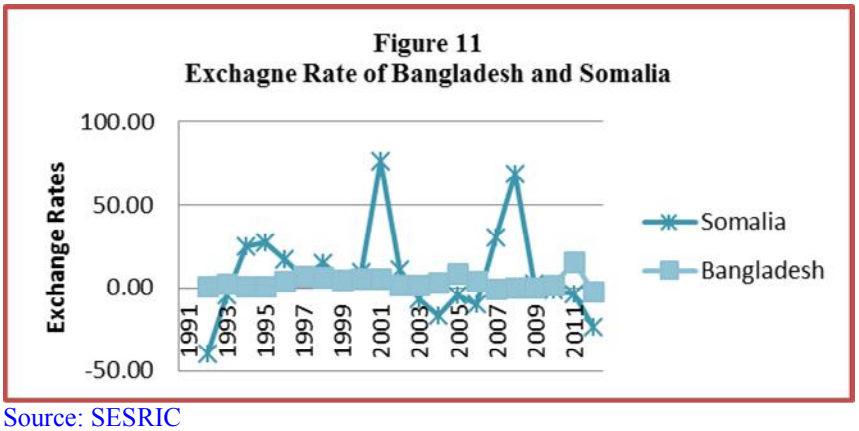
of Somalia's trading partners). As shown in figure 11, similarly, the value of US dollar behaves differently in Bangladesh and Somalia. This shows the existence of a significant currency mismatch between Somalia and its trading partners.

Figure 10
Exchagne Rate of Somalia and UAE



Source: SESRIC

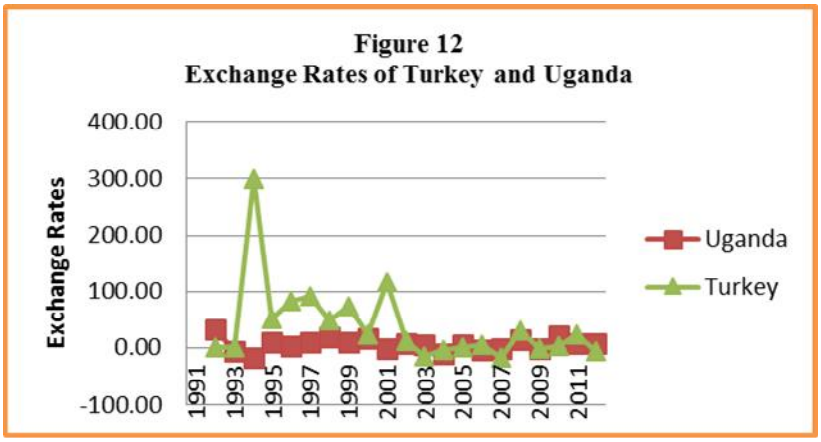
Figure 11
Exchagne Rate of Bangladesh and Somalia



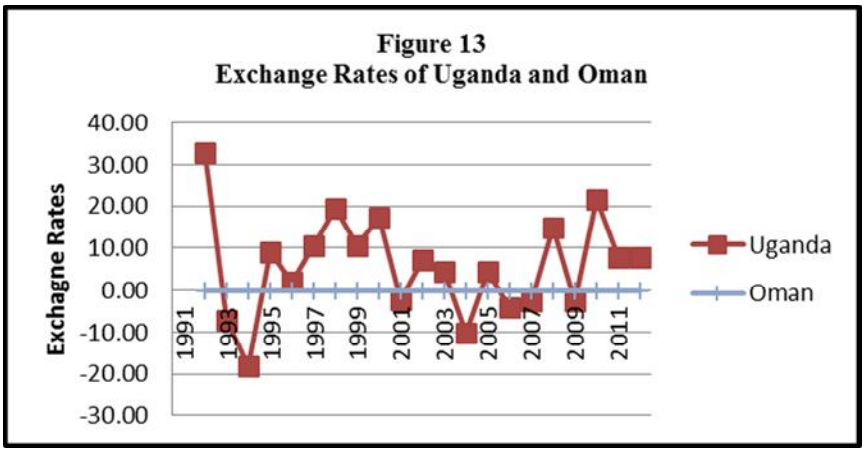
Source: SESRIC

Similar to the currency mismatches between Somalia and its trading partners, there is also a significant currency mismatches between Uganda and its OIC trading partners (Turkey and Oman) as shown in figure 12 and 13. This provides an evidence of how OIC economies in East Africa are suffering due to the use of US dollar as a medium of trade exchange.

Figure 12
Exchange Rates of Turkey and Uganda

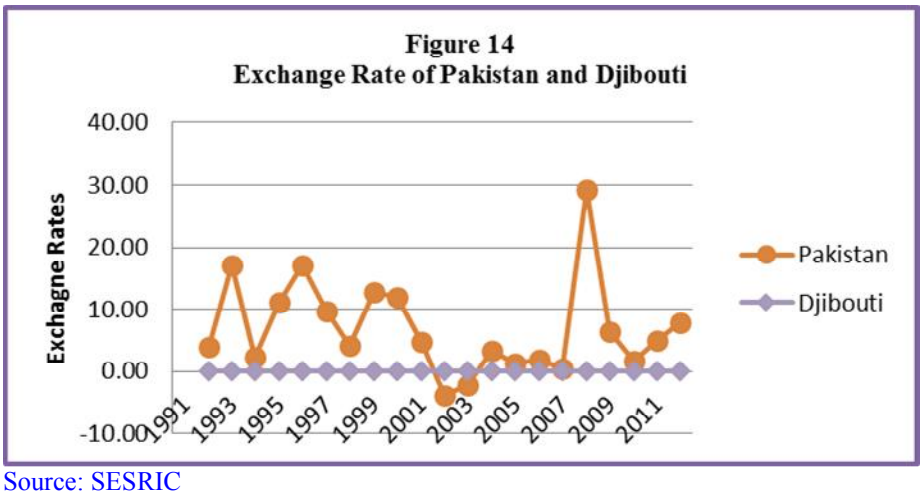


Source: SESRIC

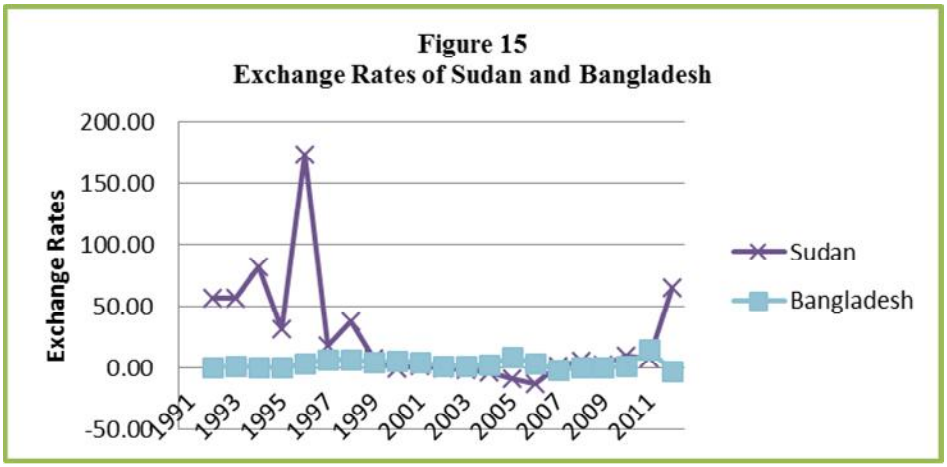


Source: SESRIC

The same currency conundrum is suffered by the trade between Pakistan and Djibouti in one side and Sudan and Bangladesh on the other side. As illustrated in figure 14 and 15, the value of US dollar in the exporting country does not match the one in the importing country, which contributes the existence of big price gaps between the exporting and importing markets.



Source: SESRIC



Source: SESRIC

The data shown in these figures illustrates that volatility of exchange rates differ between East African OIC economies and its OIC trading partners. While the value of US dollar appreciates in East African, it value is going down in OIC exporting economies or there is no changes in the value of US dollar while it is changing in East Africa. This partially explains the reason behind the huge price gabs between East African markets and their trading partners. All these mismatches are directly affecting the prices of imported goods as the dollar is used as a medium of trade exchange. This makes US dollar a vital determinant of prices of goods traded among OIC member states

4.3 Policy Implications

This study has imperative policy implications to OIC economies because the existence of huge price gaps among OIC member states exacerbates the trade relations among these countries. This is also a big challenge to the accomplishment of OIC targets. OIC has established several frameworks to strengthen intra Islamic economic and trade cooperation, which is expected to facilitate the establishment of as Islamic common market (Kusuma, 2010). Nevertheless, if such currency conundrum persists among OIC member states, the achievement of trade and economic cooperation will be impossible. On the other hand, it has been observed that the victims of such drastic price changes are the consumers rather than traders because in most case traders adjust the prices and they let the public feel the pain. Since exporting and importing economies of OIC do not know the monetary policies guided by the US dollar, they cannot have any contribution to its stability.

To achieve its goal of strengthening economic and trade cooperation in the Muslim world, OIC should come out with strategies to overcome such currency conundrum among OIC member states and develop a medium of exchange that is suitable to intra-OIC trade. Likewise, countries in the Muslim world should find a solution for this matter to achieve the central goals of an Islamic economic system. Finding a suitable solution for this matter is beneficial to both exporting and importing OIC economies. Importing OIC economies can achieve stable prices, while goods of the exporting OIC economies will become more competitive in the importing economies such as East Africa.

5. CONCLUDING REMARKS

The purpose of this paper was to examine the impact of using US dollar as a medium of trade exchange among economies in the Muslim world (OIC member states). The findings suggest adoption of US dollar as a medium of trade exchange among OIC member states has an adverse effect on the prices of goods exported to East African OIC economies. The use of US dollar as a medium of trade exchange among OIC countries does not promote the intra-OIC trade and consequently OIC member states cannot achieve a greater economic and trade cooperation. OIC member state should find a suitable solution for this matter. Achieving such kind of solution is important for both exporting and importing economies. Importing economies will achieve relative price stability, while exporting countries will gain competitive advantage in the importer's market.

6. LIMITATIONS AND FUTURE STUDIES

There are some limitations that should be addressed by future studies. Firstly, as this study employed only 11 OIC member states (seven exporting and four importing), future studies should increase the sample of both exporting and importing countries. Secondly, this study has only modeled for the exports to East African OIC states but future studies should also model exports from East African OIC states to other OIC countries. Thirdly, future studies should also examine goods imported from an OIC country and then exported to a third country, which might increase the number of currencies involved. Lastly, future

studies should examine the real prices of the goods traded within OIC member states and how they are fitted in these models.

REFERENCES

Ahamat, H. (2009). The Justifications and Legal Framework for Liberalising Intra-OIC Trade. *Journal of Economic Cooperation and Development, 30*(4), 1-28.

Arize, A. C., Osang, T., & Slottje, D. J. (2000). Exchange-Rate Volatility and Foreign Trade: Evidence from Thirteen LDC's. *Journal of Business & Economic Statistics, 18*(1), 10-17.

Baum, C. F., & Caglayan, M. (2012). On the sensitivity of the volume and volatility of bilateral trade flows to exchange rate uncertainty. *Journal of International Money and Finance 29*, 79–93.

Burdekin, R. C. K., & Weidenmier, M. D. (2000). Inflation Is Always and Everywhere a Monetary Phenomenon: Richmond vs. Houston in 1864.

Chapra, M. U. (1985). *Towards a just monetary system*: Islamic Foundation.

Chhibber, A., & Shafik, N. (1990). Exchange Reform, Parallel Markets and Inflation in Africa: The Case of Ghana.

Chwialkowska, L. (July 25, 1998). "The global economist at home: From his Tuscan castle, Canadian Robert Mundell is changing world economies," *The Ottawa Citizen*.

Friedman, M. (1977). Inflation and Unemployment. *Journal of Political Economy, 85*(3), 451-472.

Glick, R., & Rose, A. K. (2002). Does a currency union afect trade? The time-series evidence. *European Economic Review 46*, 1125 – 1151.

Jeong, J.-G., Philip Fanara, J., & Charlier E. Mahone, J. (2002). Intra- and inter-continental transmission of infation in Africa. *Applied Financial Economics, 12*(731-741).

Kaleem, A. (2000). Modelling monetary stability under dual banking system: the case of Malaysia. *International Journal of Islamic Financial Services, 2*(1), 21-42.

Kaplinsky, R., McCormick, D., & Morris, M. (2007). The Impact of China on Sub-Saharan Africa

King, M. (2001). No Money, No Inflation-The Role of Money in the Economy. *Economie Internationale 88*, 111-132.

Kusuma, D. B. W. (2010). *Analysis the Impacts of Exchange Rate Fluctuation toward the of Exports and Imports Performance in the OIC Member Countries*. Paper presented at the 2nd International Conference in "Economic and Trade Integration Among OIC Member Countries: Opportunities and Challenges" On November, 21-22, 2010 Tehran – IRAN.

Masron, T. A., & Yusop, Z. (2009). Reserve Pooling and Its Implication on Optimum Currency Area in ASEAN. *The Singapore Economic Review, 54*(02), 299-312.

Ozkan, M. (2008). Turkey Discovers Africa: Implications and Prospects. *SETA PolicyBrief*. Retrieved from

Sahib, A. S. A., & Kari, F. (2012). Analysis of Intensity of Intra-Regional Trade in GCC Countries, 1998-2008. *International Journal of Trade, Economics and Finance, 3*(3).

Singh, S. K. (2007). India and West Africa: A Burgeoning Relationship. *AFRICA PROGRAMME/ASIA PROGRAMME BRIEFING* Retrieved from