An Inquiry into Exchanges Rate Misalignments as a Cause of the Major Global Trade Imbalances

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Abstract

In the context of debate on the competitive devaluation and trade imbalances, this study investigates the role of exchange rate misalignments as a determinant of trade imbalances in selected major trade surplus (Germany, China, Japan, Russia & KSA) and major trade deficit countries (USA, UK, France, India & Turkey). It does so by investigating whether the exchange rate has been misaligned from its equilibrium values (competitive devaluation) and whether there is some nexus between the real exchange rate misalignments and trade imbalances in under analysis economies. Employing a Structural Vector Autoregressive (SVAR) Model on data from Q1 2000 to Q1 2016, findings suggest that exchange rate misalignment from equilibrium may have some implications for the current account balance for the surplus and deficit countries. However, the effects observed were very mild and transitory. There was a heterogeneity in the response of the current account position to exchange rate misalignments in each country, concomitantly; the exchange rate misalignments shall not be seen as the sole responsible factor in the debate on global trade imbalances.

Key Words: Exchange Rate Misalignments, Trade Imbalances, Competitive Devaluation, Competitiveness, Investment & Savings, J-Curve.

JEL Codes: F14, F31, O24

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1. Introduction & Background

Trade imbalances are not a new phenomenon in the history of international trade and finance, an imbalance occurs when a nation exports more than it imports (trade surplus) or vice versa (trade deficit). A surplus is often desirable and the deficit is not, nevertheless, in this balancing the value of currency or exchange rate is perceived to play an important part (Bahmani-Oskooee and Ratha, 2004). If the value of the currency is lower as compared to the competitors or trading partners, the products of such a country will be more attractive in the eyes of foreign consumers as they have to pay less in their own currency. Concomitantly, this aspect of currency devaluation or exchange rate can induce countries to keep the value of their currencies deliberately below what might be perceived as the equilibrium level in order to gain competitive advantage, a practice often referred as the "competitive devaluation". This misalignment of the exchange below equilibrium has also been stated as a cause of phenomenal growth by some of the developing economies in the recent past (see, for instance, Gala and Lucinda, 2006; Rodrik, 2008 and Wong; 2013). However, some empirical studies suggest that evidence does not support the notion that the devaluation is universally responsible for economic expansions (Bahmani-Oskooee and Gelan 2013).

The global trade outlook of past few years, particularly since the Global Financial Crises (GFC) suggests the build-up of huge global imbalances in international trade. A depiction of mountainous imbalances is prima facie in Figure 1. Countries like Germany, KSA and China been running trade surpluses as high as almost a quarter of their national income. Although due to the recent plunge in the oil prices flip the situation for KSA, however, the other countries have still been running large surpluses. On the other hand, countries, for instance, USA, UK and Turkey have been running huge deficits.

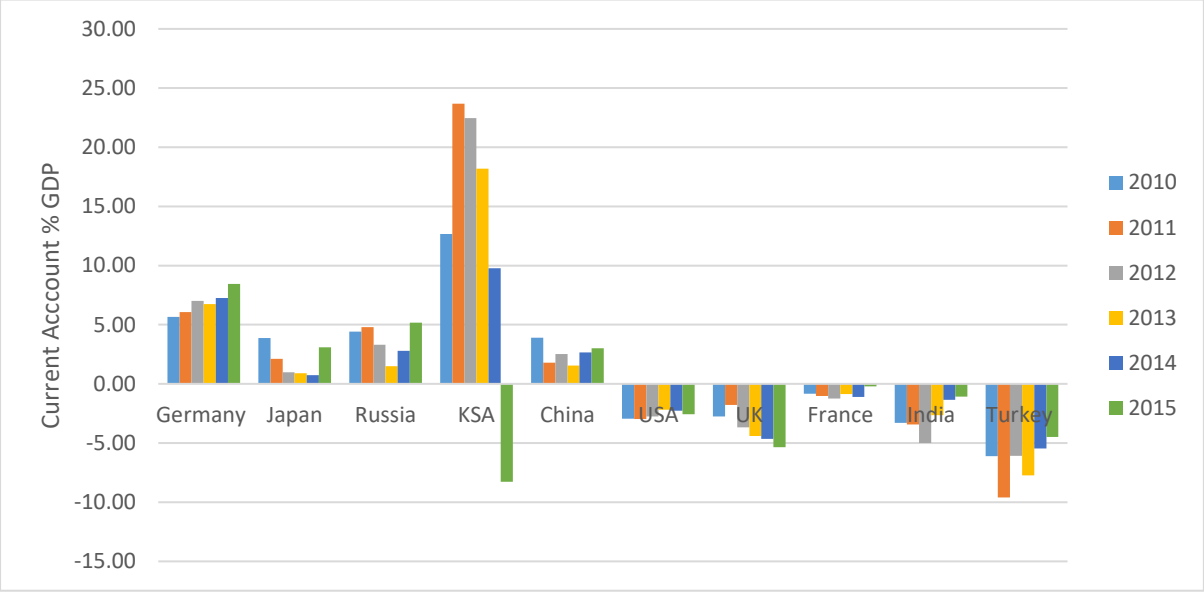


Figure1: Current Account Balance as % of GDP (2010 – 2015): Source: Authors calculations using data from the World Bank (2016)

The countries running large trade surpluses, particularly Japan, China and Germany have been accused of competitive devaluation, although there has been a long-term appreciation in the Renminbi in the last decade and a half. Perhaps, denial of such an accusation argues that China has been rather more focused on the provision of liquidity to the real economy which may have led to depreciation as a by-product of monetary policy actions (Briscoe, 2015). The recent act of putting China, Japan and Germany on the potential exchange rate manipulators observation list by the US and stance by the current

administrations reinvigorated the debate on the competitive devaluation[2]. While, criticising the notion of competitive devaluation, Reinhart (2017), Sachs (2017), Eichengreen (2017) and Fratzscher, (2017) declared it to be an imbalance in the investment and saving than the issue of competitive devaluations. In next section we will have a detailed discussion on this aspect, however, an interesting aspect to be noted here is that there is no consensus on how much devaluation or undervaluation (either competitive or structural) is there in a particular currency, for instance, study by Gan et al (2013) suggested that the Renminbi was overvalued in the range of 0.27 - 11.26 % from the 1st quarter of 1991 to 3rd quarter of 2003 and then it was undervalued in the range of 1.13% - 8.69% from the 4th quarter of 2003 to the end of 2007, whereas other studies on the same quest, for instance, Wang (2004), Funke and Rahn (2005) and MacDonald and Dias (2007), each of them suggested different levels of misalignments (under and overvaluations). In recent evidence, Yue et al (2016) reported that the equilibrium exchange rate in China has actually risen 45% between 1994 to 2012. Hence, the question of overvaluation or undervaluation might be exotic and interesting due to its political dimension, yet the answer varies, depending on the underlying methods used to establish the degree of misalignment as well as the under analysis economy and time horizon. On this aspect, empirical studies by Bahmani-Oskooee and Gelan (2013) on African countries also reported mixed results. Although Bonatti and Fracasso (2016) cautioned that by lifting the capital control and free float of Renminbi will restrict the Chinese authorities' ability of market intervention and resource allocation, one cannot dispute that the choice of the exchange rate regime is purely a sovereign nation's internal affair. In principle, the point of argument could be the issues around competitive devaluation due to the beggar thy neighbour consequences. On this aspect, Variar (2011) argued that in the post-Global Financial Crisis (2008) there has been the politicization of economic issues which included unfair trade distortions and devaluation of the currencies. Similarly, Čerović et al (2014) argued that the crisis has reignited and fuelled the debate between liberalism versus protectionism and the protectionist measures have been taken to protect national interests. Shelburne (2010) echoed these concerns and argued that these measures have a beggar-thy-neighbour component. The empirical evidence also suggests that the GFC has affected the income elasticities of trade in emerging economies[3], though the exchange rate elasticities were not much affected by the crises (Ketenci, 2014). However, we must not lose sight of the fact that there has been a *persistent disequilibria* in the international trade before the GFC. This had become explicit since the beginning of 2000s as the warning flag was also raised by the IMF (El-Erian, 2012). In fact, some scholars associate it with the financial liberalisation which began in 1980s (see e.g. Dooley et al., 2003; Caballero et al., 2008; Chakraborty and Dekle, 2009). According to Altuzarra et al (2010) the North American economies, emerging Asia, oil exporting countries and Japan were the main protagonists of the disequilibria. The US trade deficit was financed by the capital flows from emerging (surplus) economies (Ito, 2008). Some authors drew a parallel of this situation with the Bretton woods II where instead of Japan and Europe, emerging Asian economies, particularly China are accumulating foreign reserves and this may end with the increase in the labour cost and concomitant loss of competitiveness (see, for instance, Dooley et al., 2003 and 2005). On the contrary some scholars argued that the global disequilibria in international trade may trigger a global crisis after the sudden stop of capital flows. Comparing these arguments, Altuzarra et al (2010), argued that it was not the case. Although the trade imbalances might have a limited role in crisis, however, it was mainly the inefficient working of domestic and international financial markets which were unable to efficiently absorb and allocate the huge international capital flows generated by the capital account surpluses economies. Furthermore, that "*the correction of these imbalances is a necessary but not a sufficient condition to solve the current*

[2] Under the Trade Facilitation and Enforcement Act (2015) US put China, Germany, Japan, Korea and Taiwan on watch list for the potential currency manipulator countries.

[3] These includes BRIICS (Brazil, Russia, India, Indonesia, China and South Africa) countries and Turkey.

economic situation. An efficient regulation of financial markets is absolutely necessary. However, both measures are long-term measures and difficult to implement. In the case of global imbalances, the reason is that these imbalances are not explained by short-run elements, like a misalignment of exchange rates, but by structural changes in the international productive chain that lead to huge trade imbalances in some emerging economies. The correction of these trade imbalances involve structural changes in the current national and international supply and demand patterns, changes difficult to implement in the short-run" (Altuzarra et al, 2010, p 26). Similarly, El-Erian (2012) argued that the persistence of the imbalances threatens the economic global wellbeing and financial stability. Therefore, it requires a high degree of international coordination and an effective and credible coordinating role by the IMF. Looking at the facts on the grounds and long-term trajectories, one could also witness that there has been an appreciation of currencies, particularly of China and Germany. In specific to the European case, although the French, Italian and Spanish currencies have seen real depreciations since GFC as suggested by the Harmonised Competitiveness Index compiled by the European Commission. However, the depreciation has not brought them on a par with Germany in terms of competitiveness, concomitantly, one shall also see the competitiveness in a broader context[4] (Tilford, 2014). A point we must acknowledge here is that Italy, France, Germany and Spain are members of the European Monetary Union (EMU) and have the same currency i.e. Euro. Concomitantly, real depreciation may occur only through domestic price and wage deflation (internal devaluation)[5]. However, beyond the comparison of the EMU members, exchange rates play a vital role in a country's level of trade, which is critical to almost every free market economy in the world (See Bahmani-Oskooee and Ratha, 2004 and Bahmani-Oskooee and Saha, 2017, Bahmani-Oskooee et al 2018). For this reason, exchange rates are among the most watched, analysed and governmentally manipulated economic measures. Perhaps, keeping this focus Reinhart and Rogoff (2009) associated a sharp depreciation with financial instability[6]. In international trade, its importance stems from the fact that it reflects the trade competitiveness. Nevertheless, the equilibrium exchange rate itself can be influenced by a number of factors, for instance, structural changes (trade and financial openness and regional specialization) trade policy technological progress and/or monetary and fiscal policies (see Saadaoui et al, 2013; Loeffler, 2015; Yue et al, 2016).Since country-specific characteristics differ, analysts are not expected to come up with conclusive sets of explanatory variables. Besides this, factors such as methodologies, sample-selection, analytical tools all influence in explaining the diverse empirical evidence. Of these, trade balance and exchange rate is one such relationship which depends, among others. Despite the growing volume of studies examining the relationships among exchange rates and macroeconomic factors, the ambiguity and inconclusiveness persist as ever before. Specifically, in this study, the analysis of the association among these variables of interest which include trade balance and exchange rate misalignment will give us an empirical insight into the nexus between them and also verify the notion that whether the trade imbalances have been influenced by exchange rate misalignments. In case we find that it is not so, it would imply that there has not been competitive devaluation, at least not in an absolute sense. One might then argue for a partial deviation of the exchange rate from its trend or other reasons of trade imbalances including saving imbalances, productivity and liberalisation of non-tradeable sectors for which further lines of inquiries may be opened. To analyse the impact of exchange rate misalignments we used a Structural Vector Auto-Regressive (SVAR) model. Our key findings suggest that although exchange rate misalignment from equilibrium may have some implications for the current account balance for the major surplus and major deficit countries, the effects observed were

[4] e.g. labour productivity or total factor productivity.

[5] In fact as Eichengreen (2017) argued that being the member of the Eurozone, Germany has no exchange rate of its own to manipulate, it is relatively open to the US exports and is also subject to the EU anti-subsidy regulations.

[6] Reinhart and Rogoff (2009) while defining the state of financial instability associated 15% depreciation with currency crises, (see Reinhart and Rogoff 2009 or Nasir et al (2014) for further details.

rather very mild and transitory. There was a heterogeneity in the response of the current account position to exchange rate misalignments in each country; hence, the nexus between exchange rate misalignment and trade deficit/surplus is rather more influenced by other factors such as saving/investment imbalances or weak productivity than solely the exchange rate misalignments.

The paper proceeds as follows, section 2 provides a discussion on the existing evidence on the nexus between exchange rate dynamics and trade imbalances, Section 3 sets out a Structural Vector Autoregression (SVAR) Model as a means to analyse the association between the real exchange rate misalignment and trade imbalances. Section 4 presents and discuss the findings and section 5 draws a conclusion and discusses the implications.

2. Nexus Exchange Rate Misalignment & Trade Imbalance

The major trade imbalances have political implications and are often exploited for political gains. Reinhart (2017) argued that since the 1980s, US has accused first Japan, then China and lately Germany for its own current account deficits. In facts it is US tax policy which favoured debt accumulation by household sacrificing saving and productivity slowdown which has affected its competitiveness. Unfortunately, the politics of trade imbalances has been more pronounced in recent years. Under the Trade Facilitation and Enforcement Act (2015) US put China, Germany, Japan, Korea and Taiwan on the watch list for the potential currency manipulator countries[7]. Criticising current US administration stance on the Germany and China, Sachs (2017) declared it to be the lack of US savings rather than the unfair trade policy by Germany and China. Eichengreen (2017) argued that the idea that the country's economic strength is its current account balance is the worst kind of economic nonsense, underpinned by the discredited mercantilism. Furthermore that ….

"*In 2016, Germany ran a current-account surplus of roughly €270 billion ($297 billion), or 8.6% of GDP, making it an obvious target of Trump's ire. And its bilateral trade surplus of $65 billion with the United States presumably makes it an even more irresistible target. Never mind that, as a member of the eurozone, Germany has no exchange rate to manipulate. Forget that Germany is relatively open to US exports, or that its policymakers are subject to the European Union's anti-subsidy regulations. Ignore the fact that bilateral balances are irrelevant for welfare when countries run surpluses with some trade partners and deficits with others. All that matters for Trump is that he has his scapegoat*". (Eichengreen, 2017, page 1)

The real explanation of the German, Japanese and Chinese surplus is neither the manipulation of their currencies or discrimination against imports, but the excess of saving over the investment and production over spending (see Fratzscher, 2017 and Sachs 2017). Whereas in the US it is the lack of savings (Sachs, 2017). The reason for excessive savings by Germany and Japan is the high old-age dependency ratios implying that the exchange rate depreciation may not have any effects on the saving rate[8]. In fact the appreciation could discourage the investment in the capital-intensive traded goods sector and encourage in the non-traded services sector which is not equally capital intensive. In fact the solution is to increase public spending to meet Germany's unmet needs in the health care, education, communication and transportation sectors. A policy which could also be fruitful for the world economy

[7] The five are on a monitoring list in a Treasury report to Congress and are described as meeting two out of three criteria that would lead to a process involving enhanced analysis, enhanced bilateral engagement and remedial action if engagement does not lead to policies that address currency undervaluation and trade surpluses. The criteria include a bilateral trade surplus of more than $20bn against the US, a current account deficit larger than 3 per cent of gross domestic product and foreign exchange intervention amounting to more than 2 per cent of GDP over a year (Plender, 2016).

[8] According to Heise (2017), by the year 2035 Germany will have more than 21 million inhabitants over the age of 67; half of them will be over 80 by 2050. Whereas in Japan, over 25% of the population is over the age of 65 (Statistics Bureau, 2017).

and periphery as well as domestic gains for Germany in terms of increasing productivity, living standards and reducing inequality. Furthermore, Fratzscher (2017) urged Germany to liberalise its mainly non-tradable services sector which obviously had less do to with the highly competitive exports sector and concomitantly with the currency manipulation (See Fratzscher,2017 and Eichengreen,2017)[9].

In terms of dealing with trade imbalances, Sinn (2017) suggested that in order to deal with the large deficits the US and the Southern Eurozone countries should have fiscal discipline. In fact on the aspect of the Q.E in the Eurozone which may leads one to argue for the depreciation and potential gains by Germany, the fact of the matter is that the German Bundesbank has been a strong opposition of Q.E. in a different account Sinn (2017), argued that the appreciation in the UK and US can be associated with their attractive and developed financial sector which attract investments from foreigners and weigh on their export sector. Similarly, Fuest (2017) argued that the issue of German surplus and resolving it is rather more political than economic. In terms of settlement of surplus it was suggested that "*It would probably be easier to boost corporate investment, such as by introducing accelerated depreciation, tax credits to promote research and development, and more generous loss-offset provisions. Indeed, boosting domestic private investment through corporate tax reform seems the best option (Fuest* 2017, *page 2*). However, on the aspect of settling these macroeconomic imbalances, it was argued that "*the Germany's critics will be disappointed by such measures. Germany represents 4.4% of global GDP. So a reduction in its external surplus, even by as much as 2.5 percentage points from the current level of 8.5% of GDP, would have a minimal impact on the global economy. An increase in demand equal to 2.5% of German GDP would boost global demand by just 0.1%. The world would lose a scapegoat for its economic difficulties. Little else would change*" (*Fuest 2017, Page 3*). In the case of Japan, in fact, the Prime Minister Abe urged countries to avoid competitive devaluation (Jackson and Landers, 2016). Nonetheless, Japan expansionary monetary stance and policy defying the zero lower bound on interest rates, in fact, led to an appreciation of the Yen rather than depreciation (Plender, 2016). Concomitantly, the argument that the expansionary monetary stance by Japan has led to competitive devaluation does not hold water. Although by the same token, one can also argue that the policy stance has also been expansionary in the US, UK and other major deficit countries in the last few years.

The notion of competitive devaluation is not an end but a means to the end, putting it simply, even if we take the competitive devaluation and its claimed benefits as given, the aim of such a strategy shall be the economic growth, not the devaluation per see. Nevertheless, the trade surpluses will be a vehicle to achieve the destined level of growth. On the potential role of the exchange rate devaluation in economic growth, Razin and Collins (1997) and later Gala and Lucinda (2006) examined real exchange rate misalignment and economic growth in both developing and developed countries. They argued that the only very high overvaluation appears to be associated with slower economic growth whilst moderate to high or not very high undervaluation appears to be associated with more rapid economic growth. Similarly, Elbadawi et al (2012) while analysing the impact of misalignment on growth in Sub-Saharan Africa argued that the overvaluation could lead to slowing the growth in these countries, while Zakaria (2010) reported positive effects of undervalued exchange rates have positively contributed to growth in Pakistan. Similarly, Wong (2013) analysing the Malaysian data argued that the increase in the exchange rate misalignment (overvalued) can decrease the economic growth, moreover, the devaluation can promote growth, they argued that the misalignment shall be avoided to enable the resource allocation according to fundamentals. In a seminal work on the role of misalignment in economic growth, Rodrik (2008) took a comprehensive and comparative approach by examining the real exchange rate misalignments and economic growth in 184 countries using panel data for the period 1950-2004. The main findings suggested that although overvaluation hurts economic growth whilst undervaluation facilitates economic growth, interestingly, results varied between developed and developing countries

[9] Eichengreen (2017) pointed out that there is no Germany University in the top 50 global ranking.

and misalignment played rather a little role in the growth of the former. Later, a study on differences between developed and developing countries by Dubas (2009) and Berg and Miao (2010) supported Rodrick's (2008) findings. Although, in the absence of consensus on the equilibrium level of exchange rate the misalignment remains a rather controversial issue (Wong; 2013) attracting the attention of economic and political circles. The point we would like to make here is that in the nexus between the competitive devaluation and growth the international competitiveness of the favourable trade positions (surpluses) are the stepping-stones. Hence, if there is not strong evidence of a relationship between exchange rate misalignment and trade surpluses, one cannot be in a position to establish that the growth has been achieved through exchange rates misalignments. Considering the impact on the balance of trade will give us insight into the issue of whether it has beggar-thy-neighbour implications.

In the seminal work on the exchange rate as a mechanism for the correctness of trade imbalances, Friedman (1953) and Mundell (1961) argued that the flexible exchange would adjust to address the imbalances fairly quickly through relative price adjustments. Perhaps, similar to the Hume's (1742) argument. However, the net benefit of depreciation can only be positive if the elasticities of export and import sum up to a value greater than unity i.e. Marshall- Learner condition (See Bahmani-Oskooee Ratha, 2004 or most recently Bahmani-Oskooee and Shah 2017 and Bahmani-Oskooee et al 2018 for interesting insight). Hence, on the depreciation, there is mixed evidence supporting the role of depreciation in improvements in trade balances (See Bahmani-Oskooee, 1991; Bahmani-Oskooee and Ratha, 2004; Bahmani-Oskooee and Hegerty, 2010; Bahmani-Oskooee et al., 2013b; Bahmani-Oskooee,2016; Yildirim and Ivrendi, 2016, Bahmani-Oskooee and Shah 2017; Bahmani-Oskooee et al 2018) and also indicating a lack of evidence on such a nexus, for instance, seminal work by Rose and Yellen (1989) and Rose (1991). In specific to China, Bahmani-Oskooee and Wang (2004) while analysing the impact of real depreciation on China reported that with a few of its trading partners there was favourable impact including the US. However, there wasn't much support for the J-Curve[10]. Whereas, Felmingham (1988) could not find the J-curve behaviour in Australia suggesting that the issues of imbalances faced by Australia were not just to be solved by a quick fix of depreciation. Nevertheless, in rather later evidence on the Austrian economy Darne and Hoarau (2007) could not find the tendency of PPP to hold in Australia. In the recent evidence from on bilateral trade balances of Bangladesh, Bahmani-Oskooee et al (2017) also reported mixed results on the presence of the J-Curve, though there was strong support for the presence of J-curve in the trade balance with the US. Similarly, in the most recent evidence, focusing on US-Mexico bilateral trade, Bahmani-Oskooee et al (2018) reported significant evidence of short and long run asymmetric effects of exchange rate changes.

A critical question that confronts analysts is to explain the relationship between exchange rate dynamics and trade balances. The evidence on this relationship is mixed; ranging from positive to negative or the absence of strong and statistically significant association. Hence, studies on causal relationships between exchange rate, its determinants and trade balance also reveal a lack of consensus. For instance, Gnimassoun and Mignon (2015), focusing on the 22 industrial countries[11] analysed the association between exchange misalignment and current account balance. They found that the persistence of current-account imbalances strongly depends on the deviation of the real exchange rate from its long-term equilibrium; however, they also reported that there was no persistence in cases of currency

[10] Initial deterioration and then long term improvement of trade balance due to exchange rate depreciation forming a J-curve response (Please see Bahmani-Oskooee and Ratha (2004), Bahmani-Oskooee and Hegerty (2010) and Bahmani-Oskooee et al., (2013b) or most recently Bahmani-Oskooee and Saha (2017) and Bahmani-Oskooee et al (2017). ,

[11] 11 euro-zone countries including Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, the Netherlands, Portugal and Spain and 11 non-Eurozone countries including Australia, Canada, Denmark, Iceland, Japan, New Zealand, Norway, Sweden, Switzerland, UK and the USA.

undervaluation or weak overvaluation; in fact, the persistence tends to augment for overvaluations which were higher than 11%. A point to note here is that the absence of persistence in undervaluation as they reported implies that either there have been no attempts to achieve the competitive devaluation, and even if there had been they would not have been really a success. Gnimassoun and Mignon (2015) also reported differences in the persistence of disequilibria in European and non-European countries. Similarly, while analysing the degree of exchange rate misalignment in Euro Area, El-Shagi et al (2016) constructed a counterfactual economics of the euro-area using synthetic matching. They argued that the peripheral countries were overvalued before the euro sovereign debt crises, whereas, in the seminal work on exchange rate misalignment in the context of Asian Financial Crisis, Chinn (1998) did not find a significant degree of misalignment preceding the crisis.

A number of studies which endeavoured to empirical establish the adjustment of current account imbalances by corrections in the real exchange rate for instance, Freund (2005), Debelle and Galati (2007) Obstfeld and Rogoff (2005), yet, there has not been much done on the nexus between exchange rate misalignments and the persistence of current account imbalance (See Gnimassoun and Mignon (2013) for discussion). To the best of our knowledge, this is the first study which is analysing the major trade surplus and deficit countries and the role of exchange rate misalignment in explaining underlying imbalances. The existing evidence and the role of exchange rate misalignment in current account imbalances is debatable, as pointed out by Gnimassoun and Mignon (2013), there is a strand of literature which assumes that the exchange rate misalignments are in fact the cause of imbalances. (See Mussa, 2005; Freund and Warnock, 2007; Edwards 2007; Méjean et al. 2011), whereas Blanchard and Giavazzi (2002) and later Stevens (2011) argued that the imbalances are actually in the saving and investment rather than exchange rate misalignment. Similarly, Al-Jasser (2011) argued that global imbalances (particularly in Saudi Arabia) are due to cyclical issues in oil supply, whereas Carney (2011) and Meirelles (2011) associated the global imbalances with the instabilities and vulnerabilities in the global financial system. Nevertheless, Shirakawa (2011) associated the Japanese trade imbalance in specific and global trade imbalances in general with the global financial imbalances[12]. Contrarily, we have some studies, for instance, Arghyrou and Chortareas (2008) on EMU and Gnimassoun and Mignon (2015) on developed economies which indicated the role of exchange rates in making current account imbalances. Concomitantly, in the absence of consensus on the role of exchange rate misalignments in explaining the imbalances and in the context of much political blame-game and accusations of competitive devaluation, this treatise is an endeavour to provide an answer with empirical support. The next section will elaborate further on it.

3. Methodology

A Structural Vector Auto-Regressive (SVAR) framework is employed to analyse the impact of exchange rate misalignments on the trade balances. Prior to the application of the model, we are required to measure the degree of misalignment in the real equilibrium exchange rates of under analysis economies.

2.1 Misalignment of exchange rate

To measure the exchange rate misalignments, we followed the footsteps of Edwards (1994) and Elbadawi (1994) and used a reduced-form ERER model, as a forward-looking Equilibrium Real Exchange Rate (ERER) model (i.e., a reduced-form equation). The ERER model is used to estimate

[12] The Financial Stability Review in her issue 15 has complied the views of prominent central bankers on the global imbalances. The list of publications is available in the Banque de France archives, https://publications.banque-france.fr/sites/default/files/medias/documents/financial-stability-review-15_2011-02.pdf

the equilibrium exchange rate of the surplus nations (China, Germany, Japan, Saudi Arabia (KSA) and Russia) and deficit nations (USA, UK, India, France and Turkey). A number of studies have supported this method of estimation for equilibrium real exchange rate (Gan et al, 2013)[13]. With the theoretical underpinning, an estimated reduced-form ERER model explains the behaviour of the real effective exchange rate associated with economic fundamentals, for instance, terms of trade, the speed of innovation, productivity and composition of the Government consumption. The Real Effective Exchange Rate provides a measure of the trade-weighted exchange value of domestic currency against multiple currencies. In seminal work, Edwards (1994) argued that the only real or as put in the original study "fundamental" variable influences the ERER in the long-run. The long linear relationship between real effective exchange rate and its fundamentals take the following form.

$$\log \tilde{e}_t = \beta F_t + \varepsilon_t \qquad (1)$$

Where $\tilde{e}_t$ is the equilibrium real exchange rate, F is a vector denoting the fundamentals(including external terms of trade, ratio of government consumption on non-tradable to GDP, level of import tariffs, technological progress, capital flows and investment/GOP ratio), and ε is random disturbance/white noise (*I.I.D*)[14]. However, the gaol of this study is not to determine the determinants of exchange rate but to analyse the implications of exchange rate misalignments for the external balances/imbalances of respective countries. The degree to which the Real Effective Exchange Rate (REER) is misaligned from the Equilibrium Real Exchange Rate (ERER) is measured in two steps. First, the misalignment is obtained by subtracting the estimated equilibrium (calculated using the decomposition techniques i.e., the HP filter) from the observed real effective exchange rate. The HP method is widely used to obtain a smooth estimate of the long term components of a series. For example, the Bank of England applies a HP filter to measure deviations from long run trends in output (Carney, 2017). In this application, the components are inferred to be representative of the long run underlying constituents (though these need not be time-invariant in the sense of forever fixed). Technically, the HP method is a two-sided linear filter, which computes the smoothed series μ of Y by minimizing the variance of Y around μ. Secondly, we compute the misalignment as the REER deviations from the trend. As presented by the Elbadawi (1994) and later Gan et al (2013) the expressions of the Real Effective Exchange Rate (REER) misalignment are given as follow:-

$$Misalignment = \frac{REER - ERER}{ERER} \; x \; 100\% \qquad (2)$$

2.2 SVAR Model:

[13] For further discussion see Gan, et al (2013), Bussière et al (2010); Chinn, (1998); Clark et al (1994); Goh and Kim, 2006; Hinkle and Montiel, 1999; Lin, 2002).

[14] Following the Gan et al (2013) approach, a time series for the equilibrium real exchange rate can be constructed using data on actual real effective exchange rate and its fundamentals to estimate the cointegration vector β of long-run parameters and choose a set of permanent values for the fundamentals appropriate to period t. An equivalent dynamic error correction model can be given as:

$$\Delta \log \tilde{e}_t = \lambda(\log \tilde{e}_{t-1} - \beta F_{t-1}) + \gamma_1 \Delta F_t + \gamma_2 \Delta log E_t + v_t$$

Where F_t is the vector of fundamentals and the disturbance v_t is a stationary random disturbance. The error correction term($\log \tilde{e}_{t-1} - \beta F_{t-1}$) incorporates the forward-looking sources of real exchange rate dynamics. The coefficient λ governs the speed of adjustment back towards the long-run equilibrium; we require its sign to be negative – in particular, for $1 < l < 0$, the corresponding long-run equilibrium is stable.

After estimation of the degree of misalignment of the real effective exchange rate, we will analyse the impact of the misalignments on the trade balances of the under analysis countries using Structural VAR model which could be depicted in the following form:-

$$TradeBalance_{tij} = \beta_{10} + \beta_{11} Misaligment_{tij} + \beta_{t-ij} TradeBalance_{t-ij} + u_t \quad (3)$$

$$Misaligment_{tij} = \beta_{20} + \beta_{11} TradeBalance_{tij} + \beta_{t-ij} Misaligment_{t-ij} + v_t \quad (4)$$

Where β_{10} *and* β_{20} are the vectors of constants, i is the observation subscript, j denotes the country under analysis, u_t and v_t are error terms.

$$u_t \sim N\,(0, \sigma^2)\ \&\ v_t \sim N\,(0, \sigma^2)$$

The model above can be re-written on the following form:-

$$\begin{pmatrix} Tradebalance_t \\ Misaligment_t \end{pmatrix} = \begin{pmatrix} \beta_{10} \\ \beta_{20} \end{pmatrix} + \begin{pmatrix} 0 & \beta_{11} \\ \beta_{21} & 0 \end{pmatrix} \begin{pmatrix} Tradebalance_t \\ Misaligment_t \end{pmatrix} + \begin{pmatrix} 0 & \beta_{11} \\ \beta_{21} & 0 \end{pmatrix} \begin{pmatrix} Tradebalance_{t-i} \\ Misaligment_{t-i} \end{pmatrix} + \begin{pmatrix} u_t \\ v_t \end{pmatrix} \quad (5)$$

We can rearrange the equation 5 to get the following form:-

$$\begin{pmatrix} 1 & \beta_{11} \\ \beta_{21} & 1 \end{pmatrix} \begin{pmatrix} Tradebalance_t \\ Misaligment_t \end{pmatrix} = \begin{pmatrix} \beta_{10} \\ \beta_{20} \end{pmatrix} + \begin{pmatrix} 0 & \beta_{11} \\ \beta_{21} & 0 \end{pmatrix} \begin{pmatrix} Tradebalance_{t-i} \\ Misaligment_{t-i} \end{pmatrix} + \begin{pmatrix} u_t \\ v_t \end{pmatrix} \quad (6)$$

The squared matrix at the left-hand side of equation contain the coefficients of the contemporary relationship. We call it Matrix A for simplicity[15]. Hence, it could also be written as follow:-

$$A \cdot X_t = a + \sum_{i=1}^{p} B_i\ X_{t-i} + E_t \quad (7)$$

Where the structural innovations are orthogonal, hence, COV (u_t x v_t) = 0 ==> E_t= (u_t x v_t) = 0

For the identification, we will have to apply restrictions in our SVAR model, in order to do so; we will use the standard or non-structural Wold-ordering en Choleski decomposition also referred to as recursive identification. The number of restrictions would be determined by the rule of thumb i.e. k (k-1)/2, as in our model we have two variables hence it will be 2(2-1)/2= 1 restrictions. The ordering of the variables will determine the way the affect each other. To impose the restrictions and their theoretical underpinnings, we consider the exchange rate misalignments shocks. It is based on the notion that the exchange rate fluctuation in the short has implication for the trade balance, however, any resulting imbalances can be brought to balance only in the long run. On this notion, one can go back as far as Hume's (`1742) price–specie flow mechanism argument[16]. Hence, in this setting, in the short-run, the exchange rate misalignments would be exogenous and shocks from the exchange rate misalignment will affect the trade balance but not the other way round. It will take the following form:-

$$\begin{pmatrix} 1 & \beta_{11} \\ 0 & 1 \end{pmatrix} \begin{pmatrix} u_t \\ v_t \end{pmatrix} = \begin{pmatrix} u_t \\ v_t \end{pmatrix} \quad (8)$$

[15] A reduced form VAR model can be reached by taking the inverse of our Matrix A and multiplying it on both sides.

[16] Hume (1742) while arguing in favour of free trade made the case against mercantilist idea of having policy to run a favourable or positive trade Balance. The price-specie flow mechanism states that, countries with positive trade balances are effectively importing gold (money) in exchange for their exports while those with negative trade balances are exporting gold in exchange for imports. The increase in gold in countries with positive trade balances causes inflation, which makes prices rise and in turn makes imports more competitive. Conversely, the decrease in gold in countries with negative trade balances causes deflation, which makes price fall and exports more competitive internationally. This cause the balance of trade to shift in both countries. Thus, Hume argued that a trade balance is relatively unimportant because it tends to balance itself out in the long term.

It appears from the (21) that this restriction imposes a recursive order on the reduced form disturbances; the contemporaneous causality is restricted to run from the exchange rate misalignments disturbances v_t to the Trade balance disturbance u_t but no the other way round. It implies that the an exchange rate misalignment shock which correspond to the innovation in v_t leads with in the period to a forecast error in the Trade balance, but not in the exchange rate misalignments because it will take time that the advantage (disadvantage) from the trade balance will lead to increase (decrease) in the demand of exports (imports) and resulting increase (decrease) in pressure on exchange rate and its misalignment. The equation 6 will take the following form:-

$$\begin{pmatrix} 1 & \beta_{11} \\ 0 & 1 \end{pmatrix} \begin{pmatrix} Tradebalance_t \\ Misaligment_t \end{pmatrix} = \begin{pmatrix} \beta_{10} \\ \beta_{20} \end{pmatrix} + \begin{pmatrix} 0 & \beta_{11} \\ \beta_{21} & 0 \end{pmatrix} \begin{pmatrix} Tradebalance_{t-i} \\ Misaligment_{t-i} \end{pmatrix} + \begin{pmatrix} u_t \\ v_t \end{pmatrix} \quad (9)$$

In our bivariate model, an exclusion restriction on Matrix A imposes a recursive order on the system i.e. Choleski decomposition. It is popular and have the benefits of easy handling in applied econometrics (Enders, 1995). Moreover, as the Choleski decomposition represents only one possible strategy for the identification of SVAR model, therefore Gottschalk (2001) argued that it should only be employed when the recursive ordering implied by this identification scheme has strong theoretical support which in our case is prima facie. Hence, the alternative for instance non-recursive restrictions introduced by Bernanke (1986) or Blanchard (1989) are not required in this case.

2.3 Stationarity

An important condition to hold before the SVAR model is applied is the stationarity of the data. A stationary data series is the one that does not possess a Unit root. The violation of the principle of stationarity which occurs in the form of unit root could lead to a spurious empirical model and concomitantly spurious results[17]. Hence, for the under analysis series (Exchange Rate Misalignments or Balance of Trade) if we consider following AR (1) process:-

$$Y_t = \emptyset Y_{t-1} + e_t \quad (10)$$

Where e_t is a random noise process, most importantly the stationarity condition for the above process is that $|\emptyset| < 1$[18]. A common practise, which we will follow in required, for converting the undesirable non-stationary series to desirable stationarity series is by the process of differencing, so if we subtract the Y_{t-1} from the both sides of equation (1) we end up with the follow:-

$$Y_t - Y_{t-1} = Y_{t-1} - Y_{t-1} + e_t \quad (11)$$

$$\Delta Y_t = e_t$$

Now as the e_t is white-noise process, hence in this case, the series Y_t is integrated of order one i.e. $Y_t \sim I(1)$ and contains a unit-root yet ΔY_t is stationary[19]. Therefore, we will perform a unit root test using the Augmented Dickey and Fuller (ADF) test. The selections of lags in the VAR model will be based on lag selection test using AIC criteria (Bahmani-Oskooee and Tanku, 2008). We will also perform the diagnostic test to see whether our results are robust, for this we will do the Wald test coefficient restriction test. We will also perform the White test to test of hetroskedacity and LM test for

[17] Granger and Newbold (1974) introduced the term "spurious" in their seminal work.

[18] In general, there are three possible cases, $|\emptyset|<1$ implying series is stationary, $|\emptyset|>1$where the series explodes and $|\emptyset|=1$ where the series contains a unit root and is non-stationary.

[19] Similarly, a series Y_t will be integrated of order *d (*denoted by $Y_t \sim I(d)$) if Y_t is non-stationary but is $\Delta^d Y_t$ *is stationary (See Asteriou & Hall, 2016).*

auto-correlation. The Impulse Response Function Analysis will also be performed to get an overall picture of association among under analysis variables.

2.4 Data: We used the quarterly data from 2000: Q1 to 2016: Q1 for Real Effective Exchange Rate and the Balance of Trade.

Real Effective Exchange Rate (REER): The Bank for International Settlement (BIS's) effective exchange rate Real (CPI-based), Broad Indices Monthly averages indexed at 2010=100, was used as the proxy for REER. The BIS effective exchange rate (EER) indices cover 61 economies, including individual euro area countries and, separately, the euro area as an entity. The most recent weights are based on trade in the 2011-13 period, with 2010 as the indices' base year. At first the nominal effective exchange rates are calculated as geometric weighted averages of bilateral exchange rates. Then the real effective exchange rates are the same weighted averages of bilateral exchange rates adjusted by relative consumer prices. The weighting pattern is time-varying and indices are available as monthly averages, however, we converted into quarterly to match with the quarterly observations of the Balance of Trade. An increase in the index value indicates an appreciation and vice versa (BIS 2016).

Balance of Trade (% GDP): On the Trade balance it was a bit more effort to find the data. The data for Saudi Arabia and Russia was particularly difficult to obtain due to the availability issues. We used the Thomas Reuters Database DataStream to access the data on balance of payment as a percentage of GDP for each country. The quarter data was available for all the countries except for Saudi Arabia where only the annual observations were available. The annual observations of Saudi current account as a percentage of GDP were converted into quarterly by linear interpolation. For Russia, we have the estimates of quarterly GDP available only since Q1 2003. We transformed data on current account balance of Russia by taking the ratio of balance with respect to GDP. Hence, for the Russia, our time span of analysis would be from 2003 Q1 and the remaining countries we would have from 2000 Q1.

4. Analysis and findings

In order to proceed with our data analysis as a first step we are to ensure that the data we have is stationary. The unit root test using Augmented Dickey and Fuller (ADF) method is performed[20]. It showed that all the series of the exchange rate misalignments were stationary at level (0) which was quite interesting with the implication that the exchange rate misalignments from equilibrium are rather transitory and there is mean reversion. Hence, the claims of consistently keeping the exchange rates below equilibrium seems rather overstated, at least in the longer term. Figure 2 below gives the graphical depiction of exchange rate misalignments in the under analysis economies during the period of study: -

[20] The results for ADF test are not presented here to conserve the space, however, are available at request.

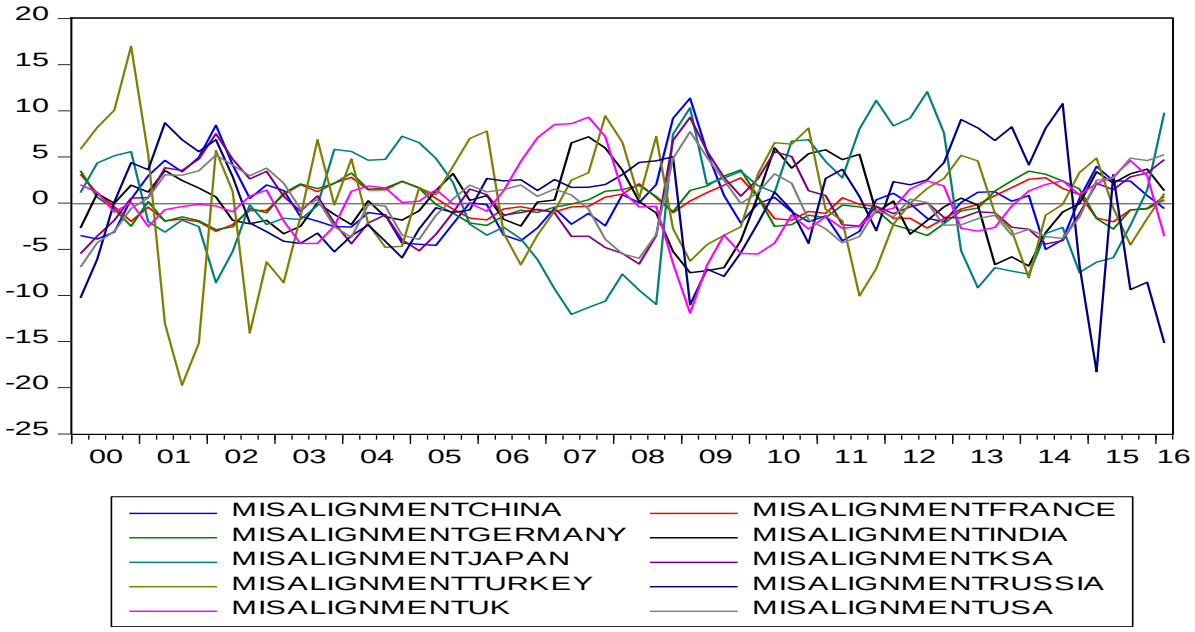


Figure 2: Exchange Rate Misalignments (Q1 2000 – Q2 2016)

Source: Authors calculations using data from BIS effective exchange rate Real (CPI-based), Broad Indices Monthly averages; 2010=100.

As it is shown in Figure 2, the exchange rate of each country fluctuated around equilibrium around the period of study and there is a repetitive reversion to the equilibrium in the long-run. The second variable of interest in our analysis is the current account balance as a percentage of GDP in the under-analysis economies. The results of the unit root test using ADF method showed that all the series were stationary at level (0) except of the Kingdom of Saudi Arabia (KSA). The results were not surprising because the KSA showed a consistent huge balance of trade surplus till the beginning of 2015 which then turned into deficit. However, after taking the first difference the series became stationary at 5% level of significance, concomitantly we will use the data series at level for all other variables and corresponding SVAR model except for KSA for which we will use the first differenced series of balance of trade as well as exchange rate misalignments.

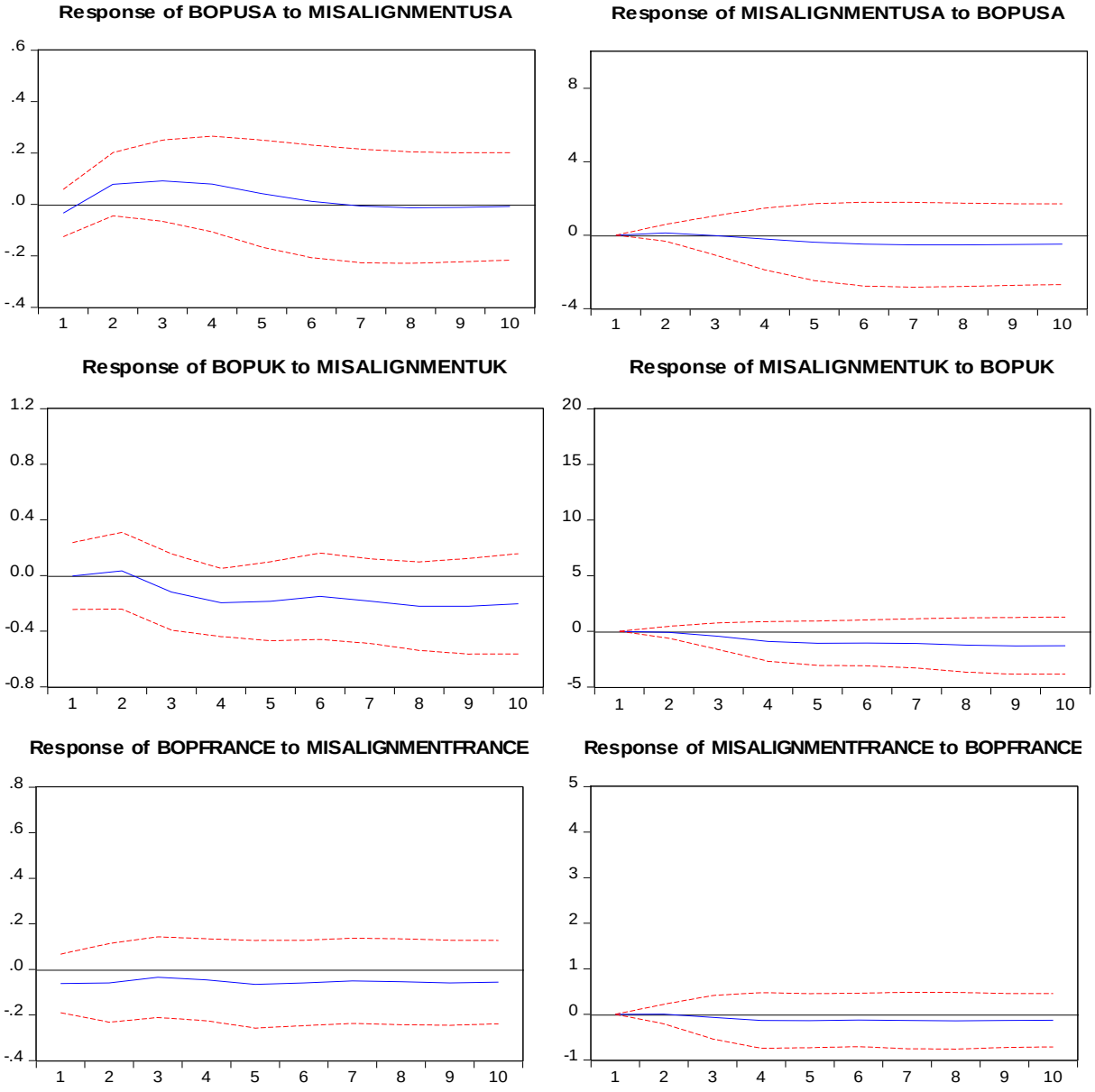
4.2 SVAR Model

After testing for the stationarity, we performed an optimal lag length selection test for the SVAR model estimation using a number of information criteria's including Akaike information criterion (AIC), Schwarz information criterion (SIC), Hannan-Quinn information criterion (HQ). For the first estimation of our model (equation 9) using data of exchange rate misalignment and balance of trade as percentage of GDP in deficit countries (USA, UK, France, India & Turkey) we found 2 lags as optimal for all the countries except Turkey (for which we used 4 lags) by all the information criteria. Considering this suggestion, we estimated the SVAR model with the short-run restriction as discussed earlier (section 2.2)[21].

4.3 Exchange Rate Misalignment & Balance of Payment in deficit nations

[21] e1 = C(1)*u1
e2 = C(2)*e1 + C(3)*u2
Where e1 represents MISALIGNMENT residuals, e2 represents BOP residuals

We estimated the SVAR and the results suggested that the SVAR is just identified[22]. The coefficient of Misalignment residuals have mostly negative values, although statistically not showing very significant impact on the balance of trade. It implies that the appreciation of currencies above the equilibrium exchange rates (upward misalignments) in the nations with large balance of payment deficits does deteriorate their balance of payment position, however, the impact is rather not very huge and not highly significant, an indication of broader issues than the exchange rates. To get an overall picture and dynamics of the balance of trade in response to the exchange rate misalignments, we also performed the Impulse Response Function Analysis and the results are presented in the Figure 3 below: -



[22] The SVAR is just identified when If No of Restrictions = k (k - 1)/2 the SVAR is just identified, where K are the number of variables. In case No. of Restrictions < k (k - 1)/2 the SVAR is under-identified and if No. of Restrictions > k (k - 1)/2, the SVAR would be over-identified. We allowed maximum of 500 iterations to reach convergence. We used the Estimation Method of scoring (Analytic Derivatives), Convergence achieved after 4 iterations (USA, France, Turkey) & 3 iterations (UK & India). The results of estimation are not presented here to conserve the space, however are available at request.

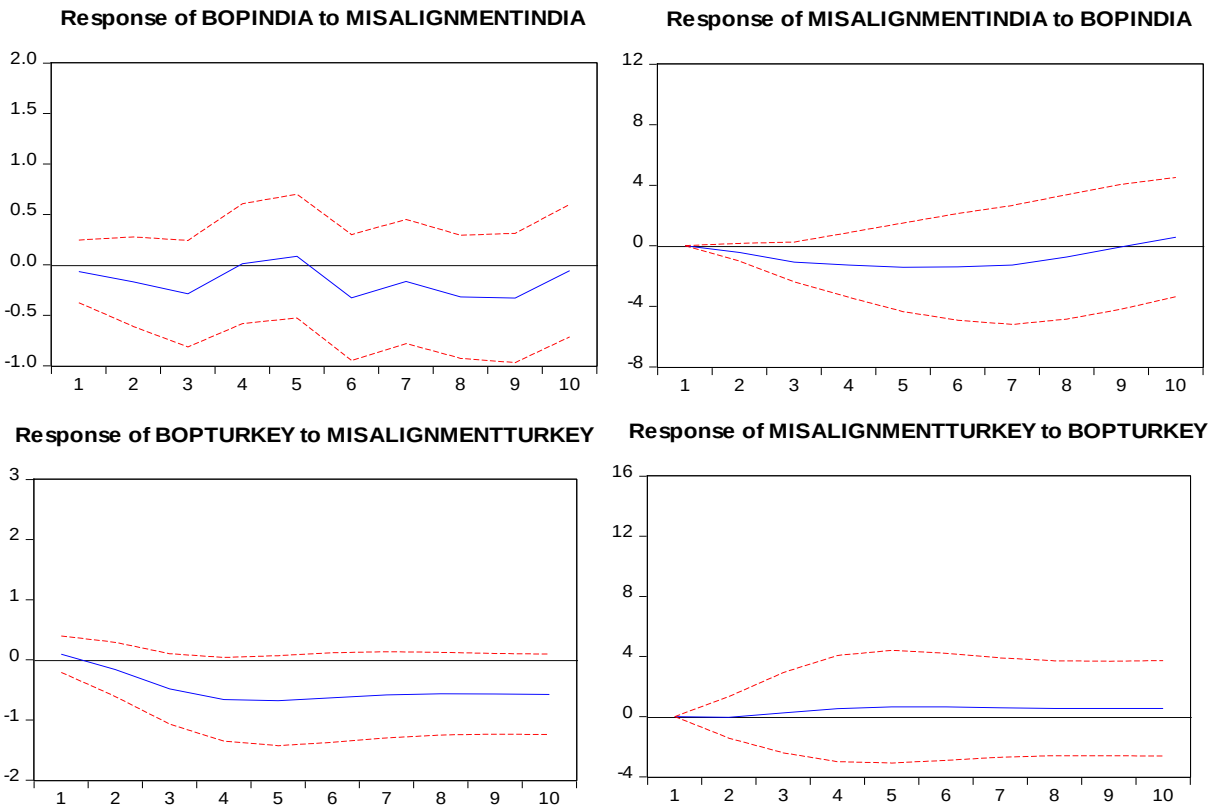


Figure 3: Accumulated Response to Cholesky one S.D. innovations ± 2 S.E.

Exchange Rate Misalignment & Balance of Trade in deficit nations

The impulses generated from the SVAR model show the loss of significance over longer lags and that the system is restoring to the mean. The main drawback of attempting to fully capture the dynamics of the system being modelled is that the longer the lags, the greater the number of parameters that must be estimated and the fewer the degrees of freedom. Moreover, the presence of several lags of the same variable leads to parameter estimates not being statistically significant (See Pindyck and Rubinfeld, 1997 and Pecican, 2010). Concurrently, although the impact of the explanatory variable does not meet the statistical level of significance, it is still important as we are looking at this phenomenon in a broader context and making our best judgment based on the view of central tendency. The seemingly minute isolation of the Balance of Trade as the percentage of national income still has vital implications for the economy; the shocks transmitted into the real economy in subsequent periods and persisted for several quarters before being completely neutralised. Hence, the balance of trade response to exchange rate misalignments is of a nontrivial importance.

The results showed that for the USA, the exchange rate misalignment did not lead to a much of a negative response from the balance of trade. In fact, a positive shock or positive misalignment (appreciation above equilibrium) can actually lead to a mildly positive response from the Balance of trade. It could be associated with the modest improvement in the current account due to the exchange rate appreciation beyond its equilibrium level. Although the results were statistically not highly significant, however, in terms of central tendency, there was clear evidence of a positive response as depicted in Figure 3. It implied that for the USA the exchange rate's downwards misalignment (depreciation) may not lead to many gains through the balance of payment, perhaps it could be associated with the elasticity of substitution between import and exports. However, overall the results were mostly showing a negative response from the balance of payment in the face of real exchange rate misalignments in all the other deficit countries. For instance, the UK and France showed a persistent

negative response of the balance of trade to the shock from the real exchange rate misalignments. Implying that the appreciated exchange rated beyond the equilibrium could have some consequences for the British and French balance of payment, however, the impact was comparatively more pronounced in the UK than in France. On the other hands, for India and Turkey, it showed that the upward exchange rate misalignments have a rather more pronounced negative impact on the balance of payment. For India, it lasted over 4 quarters whereas in Turkey the Balance of Payment could not return to equilibrium during the under analysis period. This difference and heterogeneity in the response as well as statistical significance of the response of trade balance in each deficit country implies that there are country level differences and structural aspects of each economy which need to be taken into account.

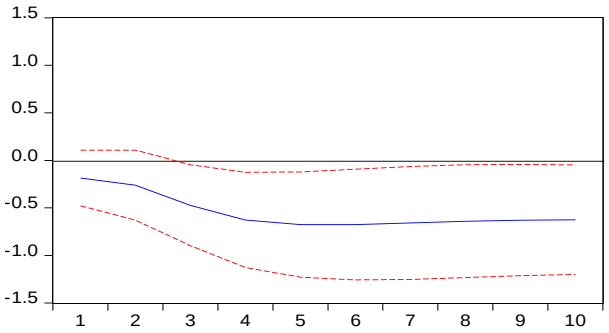
Coming to the shock to the Balance of trade and response of real exchange rate misalignment, it showed that the improvements in the balance of trade did not show much response to the exchange rate misalignments in the short-run, it is also intuitive and in line with the restrictions imposed in the SVAR model. On the whole, it implied that there were lesser negative consequences for the upward/positive exchange rate misalignments/disequilibrium of the exchange rate for the developed countries balance of payments, particularly for the USA rather than the developing countries (India & Turkey) which are running large deficits. These findings provide some further insight and logical basis to the claims of the greater impact of exchange rate misalignments on growth in developing countries than the developed countries reported by Gala and Lucinda (2006), Rodrick's (2008), Dubas (2009) and Berg and Miao (2010). The findings are reflecting on the notion that the exchange rate channel is rather more important for the developing countries.

4.4 Exchange Rate Misalignment & Balance of Payment in Surplus Nations

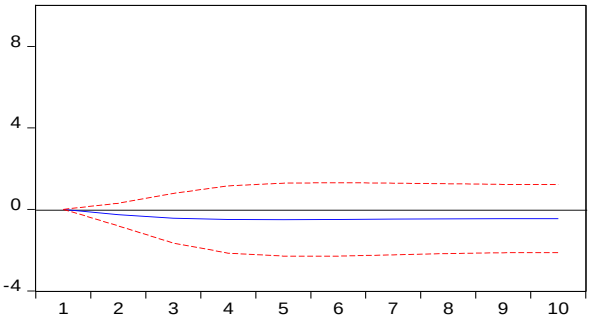
We performed an optimal lag length selection test for the SVAR model estimation, a number of information criteria's including Akaike information criterion (AIC), Schwarz information criterion (SIC), Hannan-Quinn information criterion (HQ) are used to decide on the optimal number of lags. For the second round of estimation of our model (equation 9) data on the exchange rate misalignment and balance of trade in the surplus countries (China, Germany, Japan, Russia & KSA) is employed. The earlier discussed short-run restrictions were imposed. Estimation results suggest that our SVAR is just identified [23] and the coefficient of Misalignment residuals have mostly negative (China, Japan & KSA) but insignificant impact on the balance of trade. The results for the Germany and Russia were although with positive sign yet the coefficient size was very minute and statistically not very significant. It implies that the appreciation of currencies above the equilibrium exchange rates (upward misalignments) in the nations with large balance of payment surpluses does deteriorate their balance of trade position, particularly for China, Japan & KSA, however the impact is rather minute and insignificant, an indication of broader issues than the short run misalignments of exchange rates which are causing the large surpluses in these countries. To get an overall picture, the Impulse Response Function analysis is performed and the results are presented Figure 4 below: -

[23] *Estimation Method of scoring (Analytic Depravities), Convergence achieve after 4 iterations (China, KSA, Japan), 3 iterations (Russia) and 2 iterations (Germany). The results of estimation are not presented here to conserve the space, however are available at request.

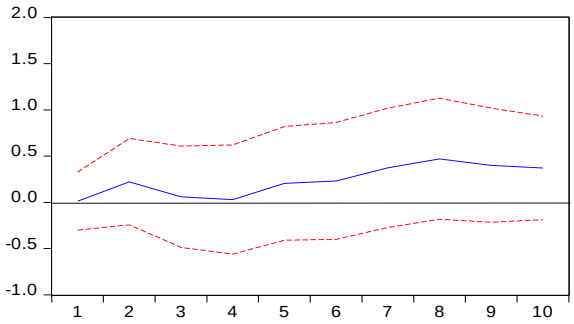
Response of BOPCHINA to MISALIGNMENTCHINA



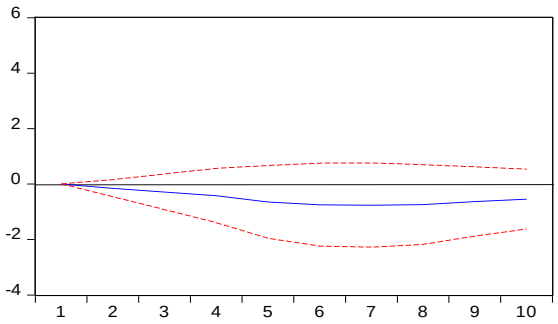
Response of MISALIGNMENTCHINA to BOPCHINA



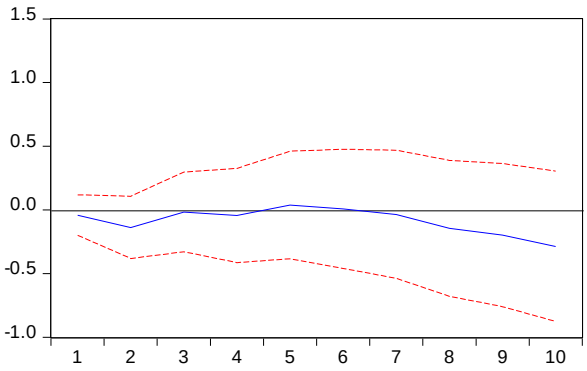
Response of BOPGERMANY to MISALIGNMENTGERMANY



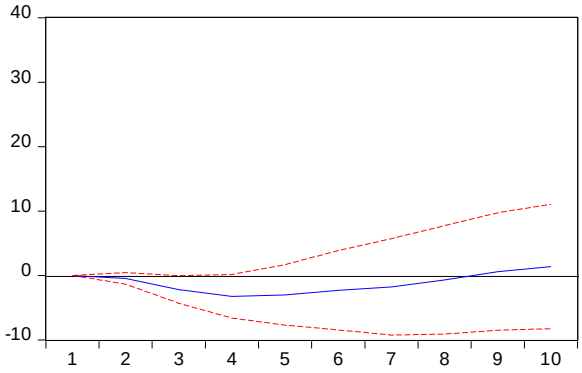
Response of MISALIGNMENTGERMANY to BOPGERMANY



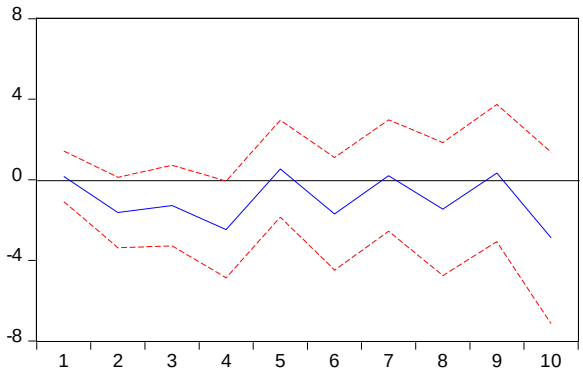
Response of BOPJAPAN to MISALIGNMENTJAPAN



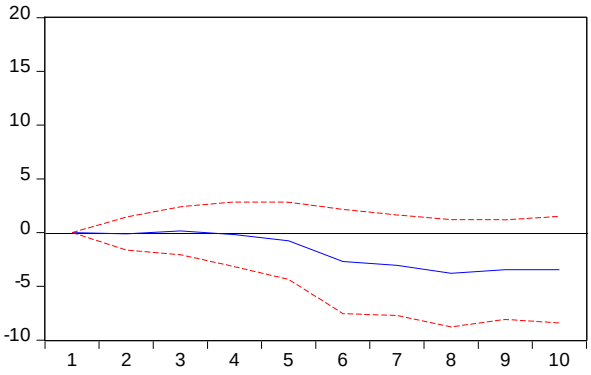
Response of MISALIGNMENTJAPAN to BOPJAPAN



Response of BOPRUSSIA to MISALIGNMENTRUSSIA



Response of MISALIGNMENTRUSSIA to BOPRUSSIA



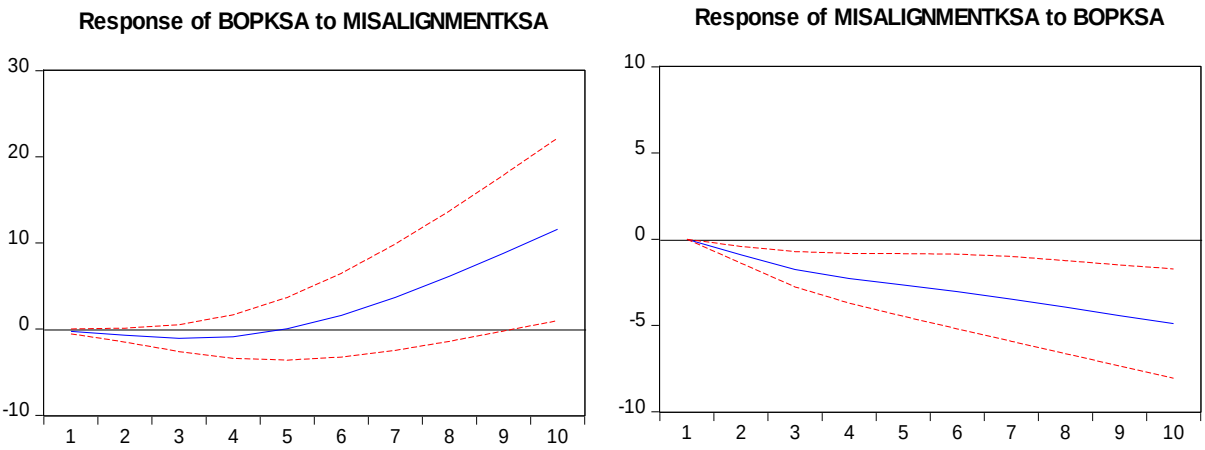


Figure 4: Response to Cholesky one S.D. innovations ± 2 S.E.

Exchange Rate Misalignment & Balance of Payment in Surplus Nations

The results showed that for China, the exchange rate misalignment did lead to a fairly well pronounced, statistically significant and persistent negative response from the balance of trade. A positive shock (appreciation above equilibrium) can actually lead to a negative response in the Chinese balance of trade which could be associated with the deterioration in the current account with the exchange rate appreciation beyond equilibrium. Although, at this juncture, we shall also take into account the fact that exchange rate has not always misalignment below the equilibrium, rather there have been episodes of positive and above the equilibrium misalignments (please refer to Figure 2). On the other hand, for Germany, the results were rather opposite, as the upward exchange rate misalignment leads to improvement in the current account balance which is an indication towards the competitiveness of the country in international trade. It implied that the German economy can actually gain from some degree of currency appreciation. Though the results were not statistically significant at 95% level of confidence, however, on the central tendency, there was a clear indication of positive response from the trade balance. For Japan, a same shock to the exchange rate misalignment led to fairly mixed results which were not very significant, yet on the whole, the exchange rate misalignments lead to a deterioration of current account balance. However, the impact is not very gigantic implying a modest loss even if the exchange rate appreciates beyond equilibrium level. The same was true for Russia, although the degree of deterioration of the balance of payment in response to the exchange rate misalignment was greater than Japan. The shock to the exchange rate misalignment in the KSA showed a modest depreciation in the country's Balance of trade, which persisted for almost 5 periods (quarters). However, in the long-run, we found that for KSA the exchange rate upward misalignment could, in fact, improve the current account position. Nonetheless, the results were also statistically significant after some lags. It implied that the appreciated value of KSA currency (Saudi Riyal) would put less pressure on the import bill in the long term.

The shock to the Balance of trade showed comparatively less pronounced response from the exchange rate misalignments. Particularly, in China, Germany and Russia, which implied that the improvement in the balance of trade does not lead to much of fluctuation in the real exchange rate misalignments, at least not in the short-run. It was in line with the theory and restriction imposed in the model. However, the exchange rate misalignment in Japan and KSA showed rather a more prominent response and it showed that in the face of a balance of trade appreciation the real exchange rate deteriorated below equilibrium. This deterioration of exchange rates was greater and more significant in KSA than Japan. On the whole, our results support the notion of country-level heterogeneity in the response to the

exchange rate misalignments (competitive devaluation) and this regard adds to the work on devaluation by Bahmani-Oskooee and Gelan (2013) on African countries. It leads us to conclude in the next section.

5. Conclusion

In the context of heated debate and rhetoric on the competitive devaluation, exchange rate misalignments and global trade imbalances, this study has investigated the role of exchange rate misalignments as a determinant of trade imbalances in selected major trade surplus (Germany, China, Japan, Russia & KSA) and major trade deficit countries (USA, UK, France, India & Turkey). Specifically, our inquiry was navigated by the motivation to find whether the exchange rate has been misaligned from its equilibrium values (competitive devaluation) and whether there is some nexus between the real exchange rate misalignments and trade imbalances in under analysis economies. Our analysis based on the SVAR model lead to conclude that although exchange rate misalignment from equilibrium may have some implications for the current account balance for the surplus and deficit countries, the effects observed varied country to country, mostly, they were very mild and transitory. There was a heterogeneity in the response of the current account position to exchange rate misalignments in each country which also lead us to conclude that the nexus between the two variables of interest is heavily influenced by the country-specific factors which may include the saving and investment imbalances, productivity, non-price competitiveness of its tradable, market access and trade network and partnerships. In specific to two of the largest surpluses countries i.e. China and Germany, only the former can have significant negative effects on the balance of trade. This finding has profound implications in terms of rebalancing of the Chinese economy from an investment to a more consumption based economy. The exchange rate misalignments in Russia, Japan and KSA were not found to be associated with the trade imbalances, in fact, the upward misalignments were associated with a positive imbalance in KSA which implied that for KSA and Russia these could be the other factors, for instance, oil price shocks than the exchange rate misalignments. On the whole, the empirical findings lead us to conclude that the case of competitive devaluation does not universally hold and there are factors beyond this phenomenon which require to be explored and addressed to solve the global trade imbalances issues, particularly in the deficit nations. The political rhetoric will not be of much help!

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