

SAMA Working Paper:

**Saudi Arabia's Exchange Rate Policy:
Its Impact on Historical Economic Performance**

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Saudi Arabia's Exchange Rate Policy: Its Impact on Historical Economic Performance*

Abstract

There are three major objectives of this paper: *first*, to examine the various exchange rate regimes and arrangements that have emerged over the last 40 years since the collapse of the Bretton Woods Agreement, focusing on the advantages and disadvantages of each, particularly as they relate to inflation and real economic growth, *second*, to analyze the historical relationship between the Kingdom's various exchange rate regimes and the performance of its non-oil private sector, and *third*, to compare Saudi Arabia's economic performance since 1986 (when the riyal was firmly pegged to the US dollar) with a number of other developed and developing countries that have followed different exchange rate arrangements. The findings of this paper confirm that the dollar peg has served Saudi Arabia well, and is likely to do so until Saudi Arabia becomes a meaningfully diversified economy, with exports denominated in a mix of currencies.

Keywords: monetary policy, exchange rate regimes, inflation, and GDP.

JEL Classifications: E52, E58, O40, O47.

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1. Introduction

Since the beginning of the modern era in 1973, Saudi Arabia's monetary and exchange rate policy has been dominated, over most of the period, by a de-facto Saudi riyal peg to either the SDR or the US dollar. Prior to mid-1981, the riyal was loosely pegged (plus or minus 7.5 percent) with the IMF's SDR basket of currencies, but, since 1986 to the present time, it has been tightly pegged with the US dollar, at SAR 3.75/\$.

Coincidentally, the beginning of the modern era in Saudi Arabia coincided with a watershed event in world economic history – the collapse of the post-World War II Bretton Woods Agreement, which pegged the value of most of the world's currencies to the dollar at a fixed rate. After the collapse, the currencies of most of the major industrialized nations of Europe (e.g., the pound, deutsche mark, French and Swiss francs), along with the Japanese yen and Australian dollar, began floating independently, with most of them appreciating against the dollar, in order to correct the chronic undervaluation that had developed in the 1960s and early 1970s.

In contrast, the immediate response of the developing countries was more varied. Many countries chose to continue their dollar peg, particularly in Central and South America. Others chose to peg their currencies to those of their former colonial rulers – e.g., the former French colonies of Africa. Others, including Saudi Arabia, chose to peg their currencies to a basket of currencies – in the case of Saudi Arabia, to the IMF's SDR.¹ Some of these pegs were “firm”, in that their value was maintained within a very narrow band. Others were “soft”; for instance, the Saudi riyal's value was initially allowed to vary by plus or minus 7.5 percent from the SDR.

Over time, the various country exchange rate regimes and arrangements have shifted and changed – for instance, the Kingdom abandoned its SDR peg in mid-1981, floated lower against the dollar between 1982 and mid-1986, and then was pegged

¹ Al-Jasser and Banafe (2005).

tightly with the US dollar in mid-1986, at a value that has not changed for almost three decades.² Perhaps the most noteworthy development has been the plethora of different combinations of regimes and arrangements, ranging from freely floating currencies with a minimum of intervention to currency unions, where an individual country completely abandons its ability to print money and practice any semblance of an independent monetary policy, even the most minimal degree of liquidity control.

This paper is divided into three parts. It will first examine the various exchange rate regimes and arrangements that have emerged over the last 40 years since the collapse of the Bretton Woods Agreement, classify and categorize them, and analyze the advantages and disadvantages of each.³ The second part of the paper will analyze the historical relationship between the different exchange rate regimes that have been practiced by the Kingdom and the corresponding economic performance of its non-oil private sector, as measured by its real GDP growth and inflation. It will look at what the economic literature has to say about emerging and developing countries in general, in relation to the impact of their exchange rate regimes on their economic performance. Next, given the current situation of depressed oil prices and export revenues, it will look at the difficulties that might be encountered in maintaining the current dollar peg through an extended period of lower oil prices.

The third and final part of the paper will compare the Kingdom's economic performance during 1986-2014, the period over which the Saudi riyal was firmly pegged to the dollar, with a number of other developed and developing economies that have followed different exchange rate arrangements. This section is not intended to be a detailed econometric analysis of the empirical evidence; rather, it will draw some obvious conclusions from a simple comparison of compound annual growth rates for real GDP and inflation among the various countries in the analysis.⁴

² *Ibid.*, p. 270.

³ Most of the information in this first section of the paper has been gathered from publications of the International Monetary Fund and the World Bank, the two major institutions that were formed to administer and implement the Bretton Woods Agreement. It should be noted that, even though the Agreement itself has collapsed, these two institutions have remained indispensable in guiding the world's governments in their monetary and financial affairs.

⁴ Future research using more detailed econometric analysis could provide us with more insight into the cause and effect relationship between exchange rate regime and economic performance in the Kingdom's case. However,

Exchange Rate Regimes and Arrangements: Classification and Analysis of Advantages and Disadvantages

Firm Peg Exchange Rate Regimes and Arrangements

Dollarization

Perhaps the most inflexible exchange rate regime is that of “dollarization”.⁵ Actually, the US dollar does not have to be used; any “foreign” currency can serve. The other country’s currency is circulated, and all bank balances are in the other currency.

The advantages of this regime include: 1) takes on the credibility of the adopted currency, 2) facilitates disinflation and reduces currency crises, and 3) has lower transaction costs and more stable interest rates. Disadvantages are: 1) complete lack of monetary autonomy, 2) central bank is no longer lender of last resort, 3) no seigniorage, 4) no ability to absorb either real or nominal shocks, and 5) difficulty in exiting, since no local alternative exists.

Currency Union

A currency union is the next most inflexible exchange rate regime, in that no individual country in the union has control over its currency or monetary policy. However, the individual countries in the union do have a voice and representation in the currency union’s central bank. The European Monetary Union (EMU, or euro zone) is the most obvious example of a currency union, but the euro itself is classified as an independent float (WB), or a free floating (IMF) currency.

The advantages of a currency union are similar to dollarization, while the disadvantages are mitigated somewhat, as follows: 1) some autonomy is gained through representation in the board of the central bank, 2) the central bank can act as a lender of last resort, but is not as politically responsive, 3) seigniorage is shared with other

the relationship seems obvious, based on both intertemporal and cross-sectional comparisons using only the simple metrics of CAGR and its volatility. In such cases, a variant of Occam’s razor law may apply – the analytical scheme with the fewest assumptions (i.e., the simplest) should be selected. We would observe that none of the many empirical analyses which we studied took into account the special case of oil-rich less developed countries. Such research remains to be done.

⁵ *Ibid.*, (World Bank, p. 6). The IMF refers to this category as “No separate legal tender” (p. 6). The US dollar is the circulating currency for eight countries, while the euro is used in three countries, and the Australian dollar in two. The Currency Union and Currency Board explanations that follow are also taken from the World Bank article, p. 6.

members of the union, and 4) systemic union-wide shocks are absorbed, but local shocks are not.

Currency Board

The country's legislature has to commit to this system, with the foreign numeraire currency guaranteed to be exchanged at a fixed rate to the local currency. Domestic currency is issued only against foreign exchange at the fixed rate.

The advantages of a currency board are similar to dollarization, as are the disadvantages, with the following exceptions: 1) some seigniorage is possible, and 2) exiting from a currency board is easier.

Fixed (Conventional) Peg

In this regime, the exchange rate is pegged to a major currency or basket of currencies (such as the SDR). However, the country's central bank is not statutorily committed to maintain the peg at that rate forever, and the peg can be adjusted either up or down when misalignment becomes a problem. The central bank can defend the peg, either through direct intervention in the spot and forward markets, or indirectly, through monetary policy and domestic interest rates. Most central bank functions are possible, but are limited, given free capital movements.

Advantages of a fixed peg regime include: 1) stability, given that the peg is credible, 2) lower interest rates, 3) provision of a clear and easy-to-understand nominal anchor, and 4) moderation of inflationary expectations for high inflation countries. Disadvantages are: 1) susceptibility to currency crises, if capital markets are open to international flows, 2) requirement of a high level of international reserves, and 3) low ability to absorb shocks, which are instead passed on to the real sector of the economy.

Both the IMF and the World Bank place a fixed peg regime in the "soft peg" category below, on the grounds that there is no de jure (legal) guarantee of the peg's permanence. In the authors' opinion, the proper standard is a de facto (empirical) peg that has remained very stable over a large number of years. In order to qualify as a fixed peg in the IMF/WB definition, a currency must not vary around its statutory pegged

value by more than plus or minus one percent for at least six months.⁶ Compare this to the Saudi riyal, which has not varied by more than 0.13 percent over the past 30 years. It seems obvious that such a stable relationship should qualify the riyal as having a “hard” peg. For this reason, we have placed the conventional fixed peg in the Hard Peg category.⁷

Soft Peg Exchange Rate Regimes and Arrangements⁸

Pegged Within Bands

In this regime, rather than being firmly fixed, the exchange rate is allowed to vary within a narrow band around the peg (which can be either a single currency or a basket such as the SDR). Saudi Arabia adopted this regime in the 1973-1981 period. Advantages of this regime include 1) somewhat more flexibility in monetary policy, and 2) a somewhat greater ability to absorb shocks. Disadvantages include the possibility that speculators can “game” the system by increasing their activity as the currency’s value approaches either of the limits, knowing that a change in the central value is increasingly likely.

Crawling Peg

In this arrangement, the exchange rate is periodically adjusted at a fixed preannounced rate to keep the effective (trade- adjusted average) exchange rate competitive. Since inflation differentials are often used, the net effect of this adjustment is to keep the real effective exchange rate from rising. The indicators used are usually forward-looking (e.g., inflationary expectations). The main disadvantage of this system is the increased likelihood that speculators can “game” the regime by estimating future inflation trends. It is also difficult to understand and explain to policy-makers.

⁶ *Ibid.*, IMF, p. 69.

⁷ A better approach would be for the IMF and World Bank to set up two conventional peg categories, based on de facto standards for both longevity and deviation from the pegged level. Countries like Saudi Arabia, with a long history of maintaining the pegged level with little or no deviations would fall into the hard conventional peg category, while countries with less success in maintaining the pegged level would be placed into the soft conventional peg.

⁸ *Ibid.*, (World Bank), p. 5.

Crawling Band

This hybrid regime combines the previous two arrangements (Pegged Within Bands and Crawling Peg), with the peg adjusted at a preannounced rate within a preannounced band. It has the same set of advantages and disadvantages, with the addition of a more complex operating procedure that is even more difficult to explain. It is somewhat reminiscent of the approach taken by the European Union in the years preceding the institution of the EMU in late 1999. The European Currency Unit, or ECU, was composed of the weighted average values of the individual member currencies. It became the central reference value for the peg, and each of the participating members' currencies were only allowed to deviate from this central value by a certain percentage. The strongest currencies would continually press against the upper limit of the band, while the weakest were always hovering at the lower limit.

Floating Regimes and Arrangements⁹

Managed Float

In this arrangement, the central bank actively intervenes in the foreign exchange market on a frequent basis. The intervention may be direct, in both spot and forward markets, or indirect, through policy interest rates and even long-term market rates. Rules, such as those used with crawling bands, can be used, but they are usually unannounced.

The major advantages of this regime are: 1) monetary policy is relatively free to be used in an effective manner to buffer external shocks and support fiscal policy, 2) it is harder for speculators to “game” the system, 3) there is a lower vulnerability to currency crises, and 4) stability and competitiveness can be maintained, if the regime is credible. The major disadvantages are: 1) the lack of transparency, since the criteria for intervention are not disclosed, and 2) relatively high international reserves are required.

⁹ *Ibid.*, (World Bank), p. 4.

Lightly Managed Float

The major difference from the Managed Float explained above is the frequency of intervention. In this regime, the exchange rate is mostly determined by market-based supply and demand fundamentals. On occasion, interventions of the same sort used in a managed float are performed, in order to moderate excessive exchange rate fluctuations. As a result, monetary policy is relatively unfettered and is mostly free to be used for domestic economic policy.

The major advantages of this regime are: 1) its ability to deflect or absorb adverse external shocks, 2) its resistance to currency crisis and speculative excesses, and 3) the fact that high international reserves are not needed. Its disadvantages include 1) increased short-term exchange rate volatility, although excessive fluctuations may be dampened by selective intervention, 2) a tendency for large medium-term swings that are only weakly related to economic fundamentals, resulting in periods of currency misalignment, and 3) the temptation for monetary policy excesses that may create an inflationary bias.

Independent (Free) Float

In this regime, exchange rates are determined by supply and demand operating freely in the foreign exchange market, without intervention by monetary authorities. Monetary policy is completely independent of the exchange rate regime and is free to be used as a tool in domestic economic management. The advantages of this regime are the same as a lightly managed float, as are the disadvantages, particularly in short-run volatility, due to a lack of intervention.

2. The Evolution of Exchange Rate Policy in Saudi Arabia: Historical Perspectives

Saudi Exchange Rate Policy and Economic Performance Prior to 1986

In US dollar terms, the 1973-1980 period saw an appreciation of the riyal, with the dollar dropping from SAR 3.56 at the end of 1973 down to SAR 3.33 at the end of 1980. This decline was due primarily to the weakness of the dollar against the SDR during that period of time.¹⁰ This period was also accompanied by a high inflation rate in the non-oil private sector, with the implicit price deflator for this sector growing at a compound annual rate of 21.1 percent. This inflation was primarily a demand-pull phenomenon, and the stronger riyal actually acted to attenuate it by helping to keep import prices low. However, the combination of the riyal appreciation and the high Saudi inflation rate meant that both the real bilateral exchange rate (against the US dollar) and the real effective exchange rate (trade-weighted) showed significant appreciation, creating a significantly over-valued currency during this period.

The decline was reversed between 1981 and 1986, with the riyal depreciating against the US dollar, as the dollar rose from SAR 3.33 up to SAR 3.75 by mid-1986. Although other analysts have attributed this decline to the general strength of the dollar, another factor was surely the decline in Saudi oil export revenues due to a collapse in oil prices and cutbacks in oil production over the same period. Oil export revenues declined from SAR 375.3 billion in 1981 down to SAR 66.7 billion in 1986, a drop of 82.2 percent.¹¹

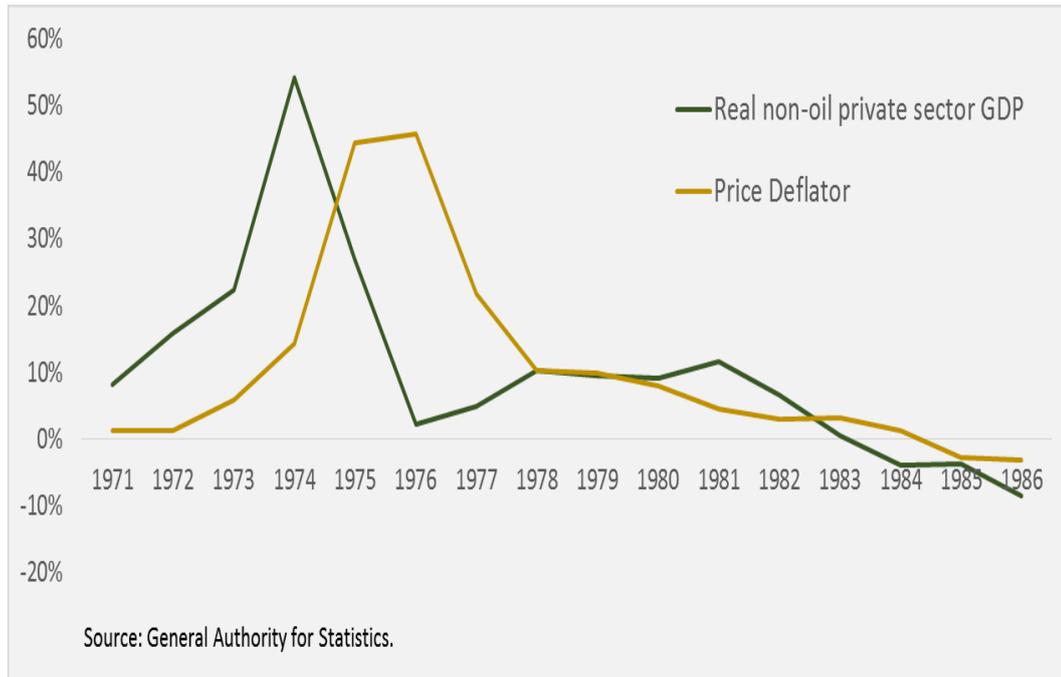
The lack of a firm dollar peg during the 1973-1986 period was accompanied by a volatile non-oil private sector inflation rate, which varied between an increase of 45.6 percent in 1976 to a 3.1 percent decline in 1986. Real private sector economic growth was also quite erratic over the same period, ranging from a positive 26.9 percent in 1976

¹⁰ Al-Jasser and Banafe (2005). It should be noted that, prior to 1973, the riyal had strengthened considerably.

¹¹ Source: SAMA Annual Report Database, Table 8-1a.

to a negative 8.5 percent in 1986. Certainly, flexible exchange rates do not appear to be a key to stability in either economic output or prices.

Figure 1: Inflation and Real Private Sector GDP Growth – 1971-1986



Exchange Rate Policy and Economic Performance after 1986

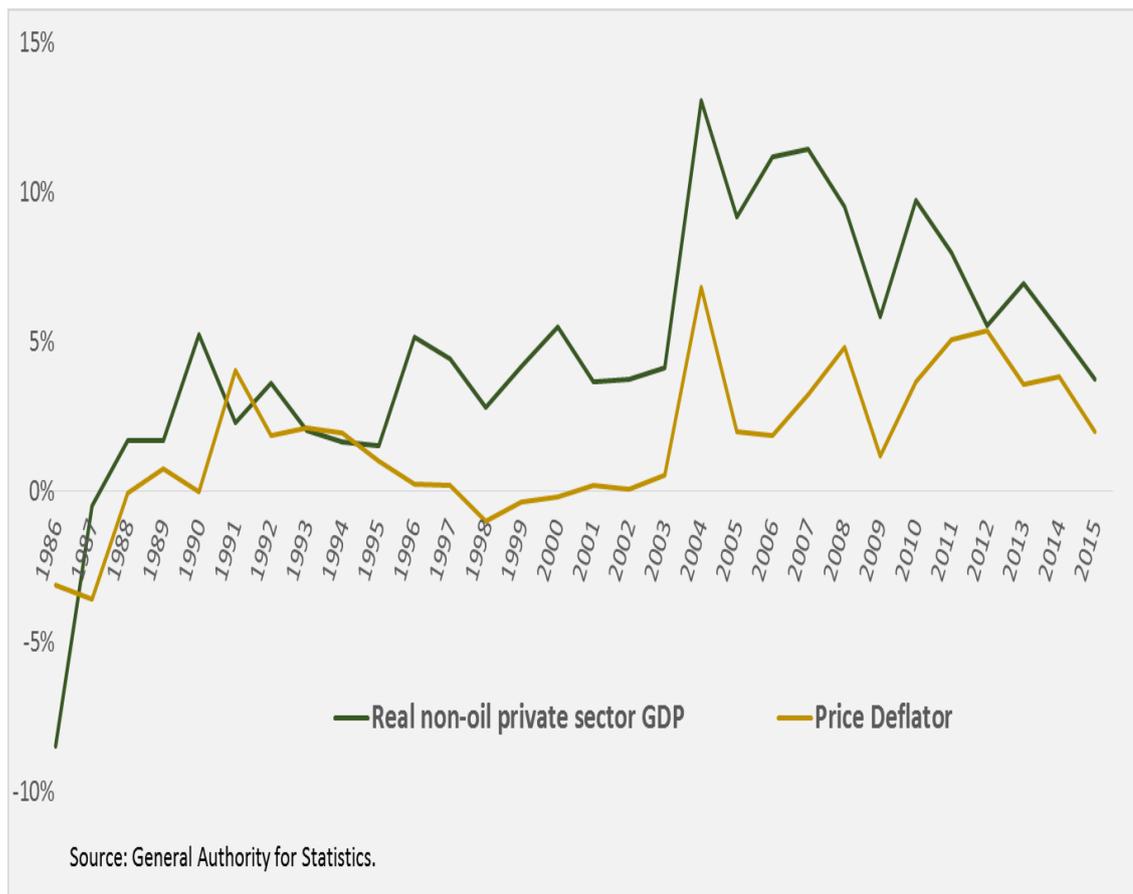
Since 1986, the riyal has been pegged tightly to the US dollar, through two major conflicts (the Gulf Wars of 1990-1991 and 2003-2004) and two major declines in oil prices (1993-2000, and 2013 to the present time) separated by a major oil price boom. Despite these enormous changes in national income, the Saudi riyal came under pressure only twice during this period – in late 1993-early 1994 and in late 1998-early 1999.¹² In each of these instances, the spot value of the riyal decreased by only 1/10th of one percent (i.e., the value of the dollar increased from 3.750 to 3.754) at its lowest. This lack of movement, despite the speculators’ efforts, was due to modest interventions by the Saudi Arabian Monetary Agency (SAMA) in the forward market, amounting to

¹² The timing of these periods of pressure was probably no accident, since the pressure originated from speculators who were waiting for the end-of-year budget statement, which included the results of the year just ending and the budget for the next fiscal year.

\$655 million in 1993 and \$820 million in 1998; both of these interventions resulted in a net profit on the forward contracts when they were liquidated.¹³

This tight peg with the dollar coincided with a much-improved set of economic results. Between 1986 and 2015, the annual inflation rate in the non-oil private sector has varied between -3.6% and 6.8%, considerably less volatile than during the 1973-1986 period. The years with negative inflation rates were primarily due to declines in export prices of petrochemical, which tend to move in tandem with oil prices. Private sector economic growth has also been considerably smoother; for example, real GDP growth has been positive for 28 consecutive years through 2015.

Figure 2: Inflation and Real Private Sector GDP Growth – 1986-2015



¹³ *Op. cit.*, p. 267.

The Relationship between Exchange Rate Regimes and Economic Performance

Although it seems obvious that there is a positive association between the pegged exchange rate and economic performance in the case of Saudi Arabia, the economic literature on this relationship for emerging and developing countries in general has been mixed. There are theoretical arguments on both sides of the issue. Factors favoring flexible exchange rates include the possibility that they could cushion price distortions and the misallocation of resources (.e.g., high unemployment) in the event of real shocks. On the side of pegged exchange rates is the argument that they can reduce relative price volatility, resulting in higher trade and investment and leading to lower real interest rates and faster growth. A credible fixed exchange rate regime can contribute to a predictable and disciplined monetary policy and can reduce the possibility of exchange rate speculation, leading to stronger economic growth.¹⁴

The empirical evidence concerning this relationship in emerging and developing economies is mixed. One of the more comprehensive studies, by Levy-Yeyati and Sturzenegger (2004), showed a strong and positive relationship between exchange rate flexibility, economic growth, and lack of volatility – i.e., more flexible exchange rate regimes were associated with faster and smoother-growing economies. It is interesting to note that this relationship only applied to the emerging and developing nations – there was no strong relationship in either direction for developed economies.¹⁵ However, the study had a major weakness in that it did not consider a country's natural resource base, particularly one that was denominated in US dollars, as a factor in the analysis.

If we look at the arguments for a more flexible currency, it becomes apparent that most of them do not apply in the case of Saudi Arabia. The possibility of real shocks causing high real exchange rates is not particularly disturbing, since an overvalued riyal is not likely to harm the Kingdom's exports, which are denominated in dollars. In addition, the Saudi economy is not particularly sensitive to high real

¹⁴ Levy-Yeyati and Sturzenegger (2004).

¹⁵ *Ibid.*

interest rates that might accompany these shocks. Furthermore, a strong exchange rate would reduce the cost of imports, which would act to keep inflation low.

Maintenance of the Riyal Peg with the US Dollar

SAMA's policy credibility and the preservation of a substantial reserve of liquid foreign currency assets are the key to maintaining the riyal peg with the US dollar. This reserve not only provides liquidity for defending the riyal, but also sends a strong message to speculators. This, of course, requires strong financial reserves, primarily supplied by Saudi government deposits. As evidence of this importance, note that both of the speculative attacks on the riyal in the 1990s came when government deposits (which are kept offshore, either as deposits in foreign banks or as investments in foreign securities) dipped to extremely low levels – only SAR 42.5 billion at the end of 1993 and 49.2 billion at the end of 1998.¹⁶ In sharp contrast, total government deposits at the end of 2015 amounted to SAR 1162.5 billion, more than 23 times as much as in 1998.¹⁷ Moreover, the massive foreign reserves maintained at SAMA (SAR 2.3 trillion at the end of 2015) is indicative of the fundamental strength underlying the dollar peg, and the credibility of its monetary policy for the meanwhile.

Much has been made of the fact that these reserves are sufficient to last for several years at the current rate of depletion. Since some energy analysts are predicting that the depressed condition of oil prices could conceivably last for longer than this, there are concerns that these reserves could be exhausted, unless government spending is curbed and new sources of revenues are obtained. However, such an analysis ignores the tremendous borrowing capacity of the Saudi government, and its ability to borrow this money from both domestic and international sources.¹⁸ A combination of targeted cuts in government spending (particularly on imported goods), combined with the issuance of government bonds to domestic borrowers (including citizens) and the

¹⁶ Source: SAMA Annual Report Database, Table 8b – Monetary Survey - Liabilities.

¹⁷ Source: SAMA Monthly Bulletin Database, Table 7b – Monetary Survey - Liabilities

¹⁸ Foreign borrowing has been very limited in the past, but the Kingdom's economic fundamentals (stable inflation environment, low debt levels, ample reserves, demographic advantages, and credible/supportive monetary policies) make this alternative possible.

spending from reserve accounts (particularly from those funds earmarked for specific capital projects) should enable the government to maintain a sufficient level of deposits with SAMA, which would in turn allow for a comfortable level of foreign reserves to be maintained.

There has been much speculation about the desirability of a devaluation of the riyal against the dollar as a way to balance the budget “painlessly”, by boosting government oil revenues, which are denominated in riyals. However, such a move would be far from painless, as it would raise import costs to both the general public and the government. It would be much better to restrain government spending, raise non-oil revenues, and borrow the funds necessary to close the revenue-expenditure gap.

3. Has the Dollar Peg Served the Saudi Economy Well? A Cross-Country Comparison

The literature has offered many reasons to think that exchange rate policy may impact economic performance. Flexible exchange rates may lead to better performance because they provide better insulation and adjustment to external shocks. On the other hand, fixed exchange rates may offer less uncertainty about the future which has a positive impact on investment, and therefore growth. In both cases, exchange rate stability may lead to better outcomes. However, a stable exchange rate at the wrong level may pump up inflation beyond the desired level. With high inflation, exports become pricey (although this does not apply to oil exports, as their price is set in the world market) and the cost of investment increases, which affects growth negatively. Therefore, historical data about GDP growth and inflation levels, together with their volatilities, can be used to assess whether the exchange rate is set properly or not. Good exchange rate regimes should contribute positively to stability and hence growth.

In this section, a comparative analysis has been performed between Saudi Arabia and the GCC, as well as the G20 countries, using the compound annual growth rate (CAGR) of real GDP and CPI over the period (1986-2014).

The general formula for the CAGR can be written as:

$$CAGR(t_0, t_n) = \left[\frac{V(t_n)}{V(t_0)} \right]^{1/(t_n - t_0)} - 1$$

Where:

$V(t_0)$ = the starting value,

$V(t_n)$ = the final value, and

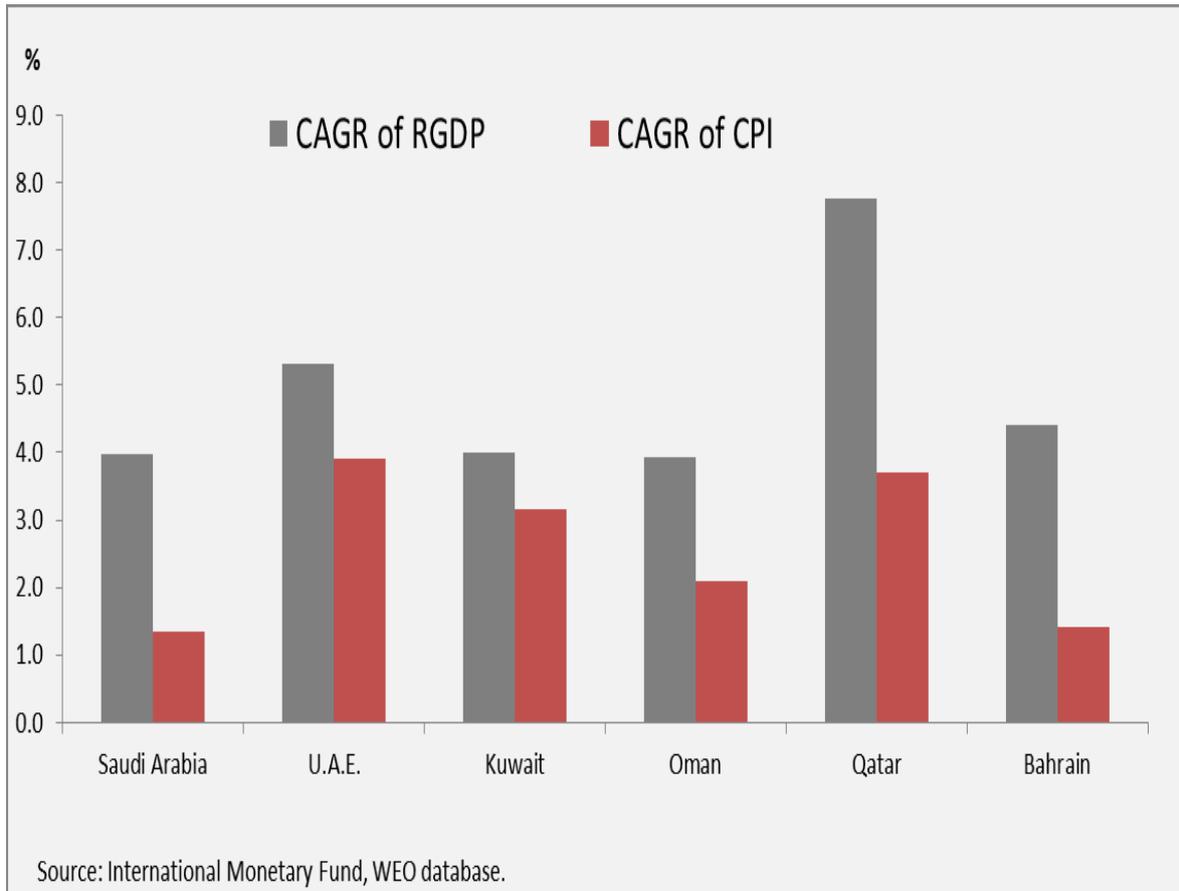
$(t_n - t_0)$ = the number of years.

The higher the CAGR of GDP, the better the growth rate over the entire period expressed in percentages. On the other hand, the relatively smaller CAGR of CPI means less inflation over the selected period.

Figure 3 displays the outcomes from computing the CAGR of real GDP and the CPI for the GCC countries over the period 1986-2014. The CAGR of Saudi Arabia's real GDP stood at 4.0 percent, while the CAGR of its CPI (i.e., inflation) stood at 1.4 percent. As can be seen, Saudi growth was slower than Qatar or the UAE, but inflation was considerably lower. However, we would argue that actual Saudi growth may be understated, due to inclusion of oil production growth in the Saudi growth figures. Over the past 28 years, the oil sector, which accounts for over 40 percent of real GDP, has been the slowest-growing part of the Saudi economy in real terms, while the non-oil private sector has been the fastest.¹⁹ Data from the Saudi General Authority for Statistics show that the CAGR for the Saudi oil sector has been 2.6 percent over that period, while the non-oil private sector's CAGR was 5.3 percent, the same rate as the UAE's growth.

¹⁹ As an illustration of this point, Saudi production of crude oil set an all-time record back in 1980, at 9.9 million barrels/day (mbd). This level of production was not surpassed until 2015, when 10.2 mbd were produced. This means that over 30% of the Saudi real GDP (which is stated in 2010 prices) showed almost no growth over the period. See Alkhareif and Alsadoun (2016) for more details.

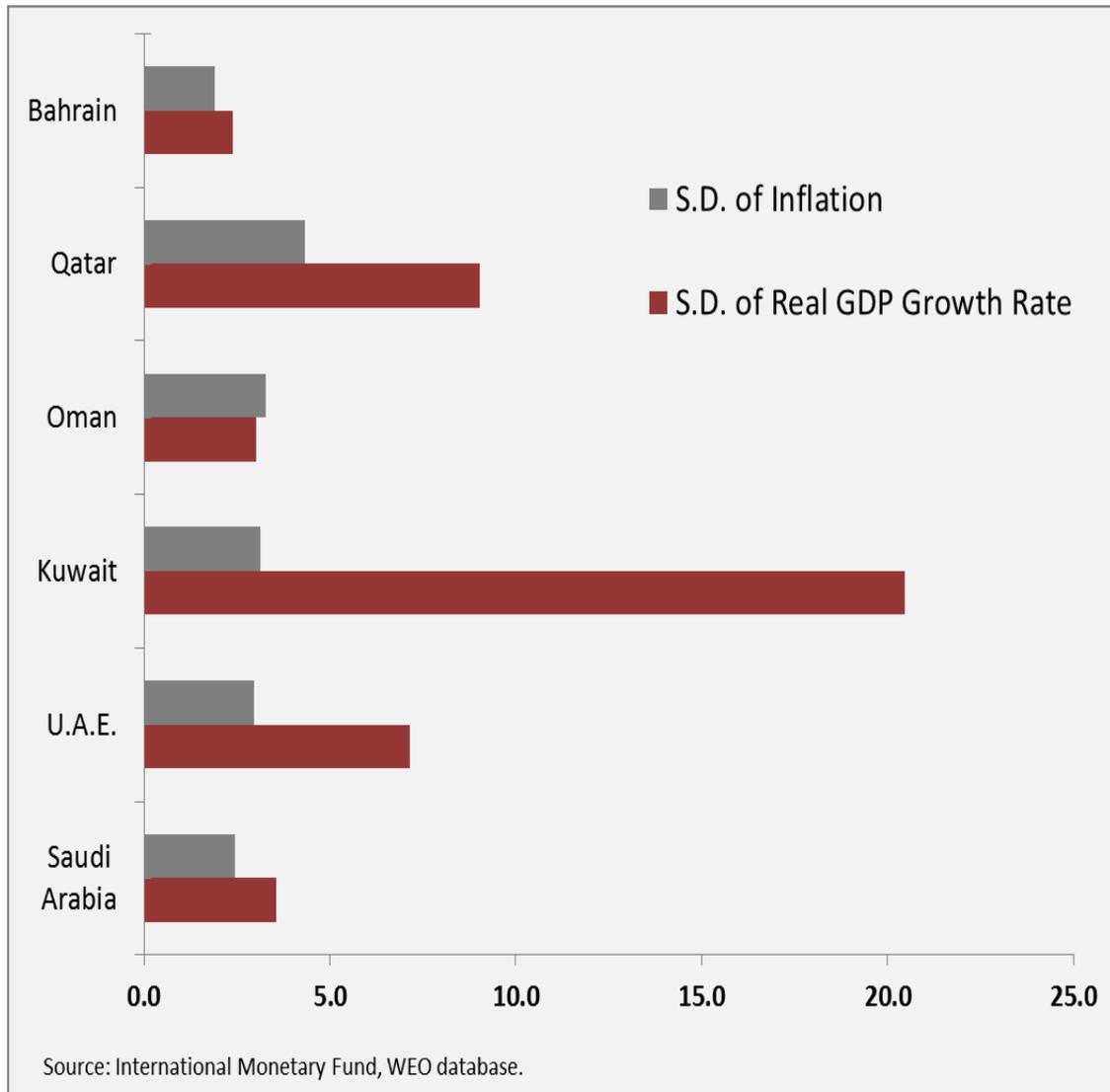
Figure 3: Compound Annual Growth Rate (CAGR) of Real GDP and CPI For the GCC Countries – 1986-2014



Saudi Arabia and Bahrain both have the lowest inflation rate over the 28 year period, while the UAE has the highest. To illustrate the impact of the difference between the Saudi and UAE inflation, the CAGR of 1.4 percent for Saudi Arabia vs. 3.9 percent for the UAE, compounded over a 28 year period, will result in a cumulative price increase of 47.6 percent for Saudi Arabia, versus an increase of 191.9 percent for Qatar. In other words, the same basket of goods and services would have been almost twice as expensive in Qatar after 28 years.

Although the CAGR is considered a useful measure of growth over multiple time periods, it neglects the volatility part of the story. To overcome this problem, standard deviations of both inflation and real GDP for the sample countries have been calculated over the same period (1986-2014). Figure 4 shows the results of these calculations for the GCC countries.

Figure 4: Standard Deviations of CAGRs for Real GDP and Inflation for the GCC Countries – 1986-2014



Saudi Arabia happens to be one of the few countries with low standard deviation of both underlying variables. Specifically, standard deviation of inflation and real GDP in Saudi Arabia was 2.5 percent and 3.6 percent, respectively. The standard deviation of inflation in Saudi Arabia was the second lowest in the GCC area, after Bahrain. The extremely high standard deviation in Kuwait’s GDP growth was undoubtedly due to the disruption cause by the invasion of the country in 1990-1991.

Table 1 summarizes the compound annual growth rates and standard deviations for the GCC countries.

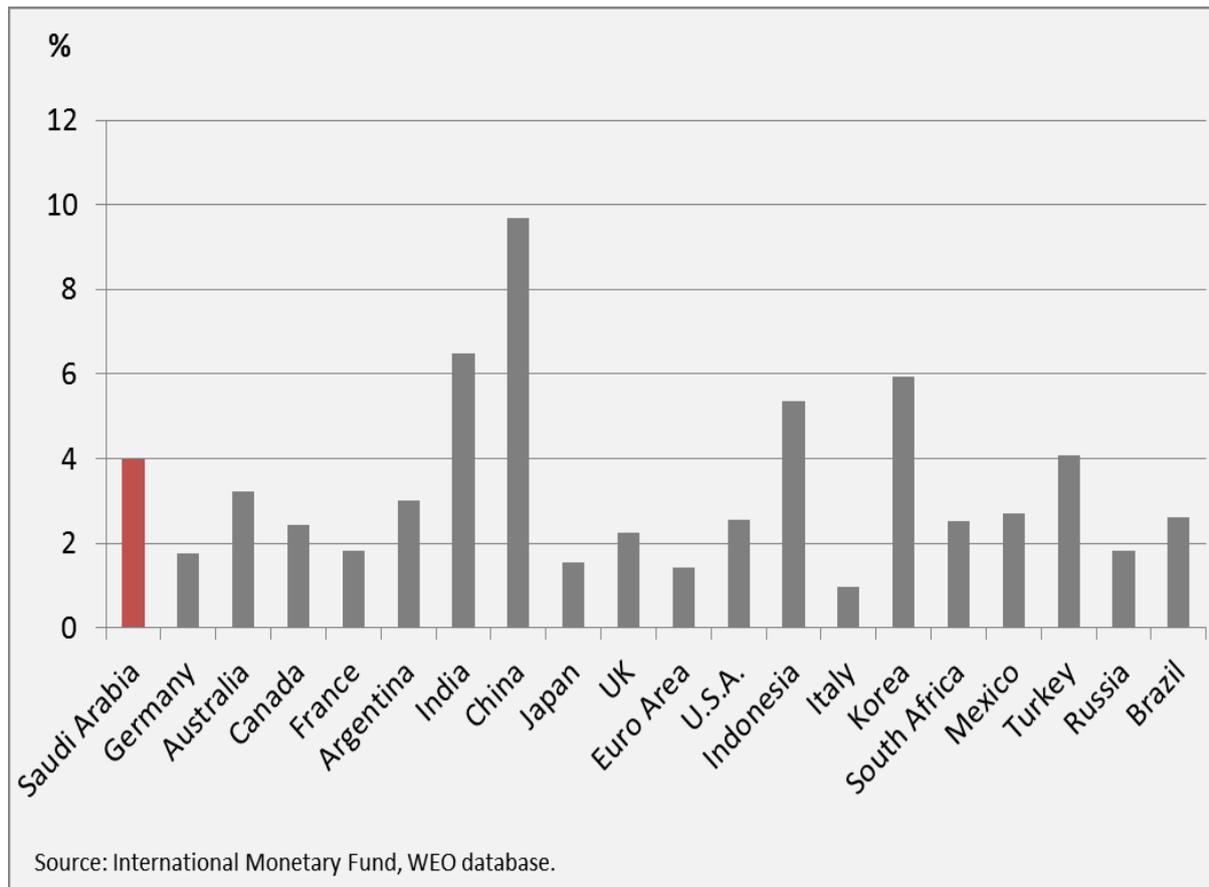
Table 1: Compound Annual Growth Rate (CAGR) of Real GDP and CPI for the GCC Countries: 1986-2014

Country	CAGR		Standard Deviation (S.D.)	
	GDP	CPI	S.D. of Real GDP Growth Rate	S.D. of Inflation
Saudi Arabia	4.0	1.4	3.6	2.5
U.A.E.	5.3	3.9	7.2	3.0
Kuwait	4.0	3.2	20.5	3.1
Oman	3.9	2.1	3.0	3.3
Qatar	7.8	3.7	9.0	4.3
Bahrain	4.4	1.4	2.4	1.9

Source: Authorities; International Monetary Fund, World Economic Outlook Database.

Turning now to the G-20 group of nations, Figure 5 shows the CAGR growth rates of real GDP for the 19 countries that belong, plus the aggregate Euro Area growth. Note that the Saudi growth of 4.0 percent places the Kingdom as the fifth fastest-growing member, growing about as fast as Turkey over the last 28 years.

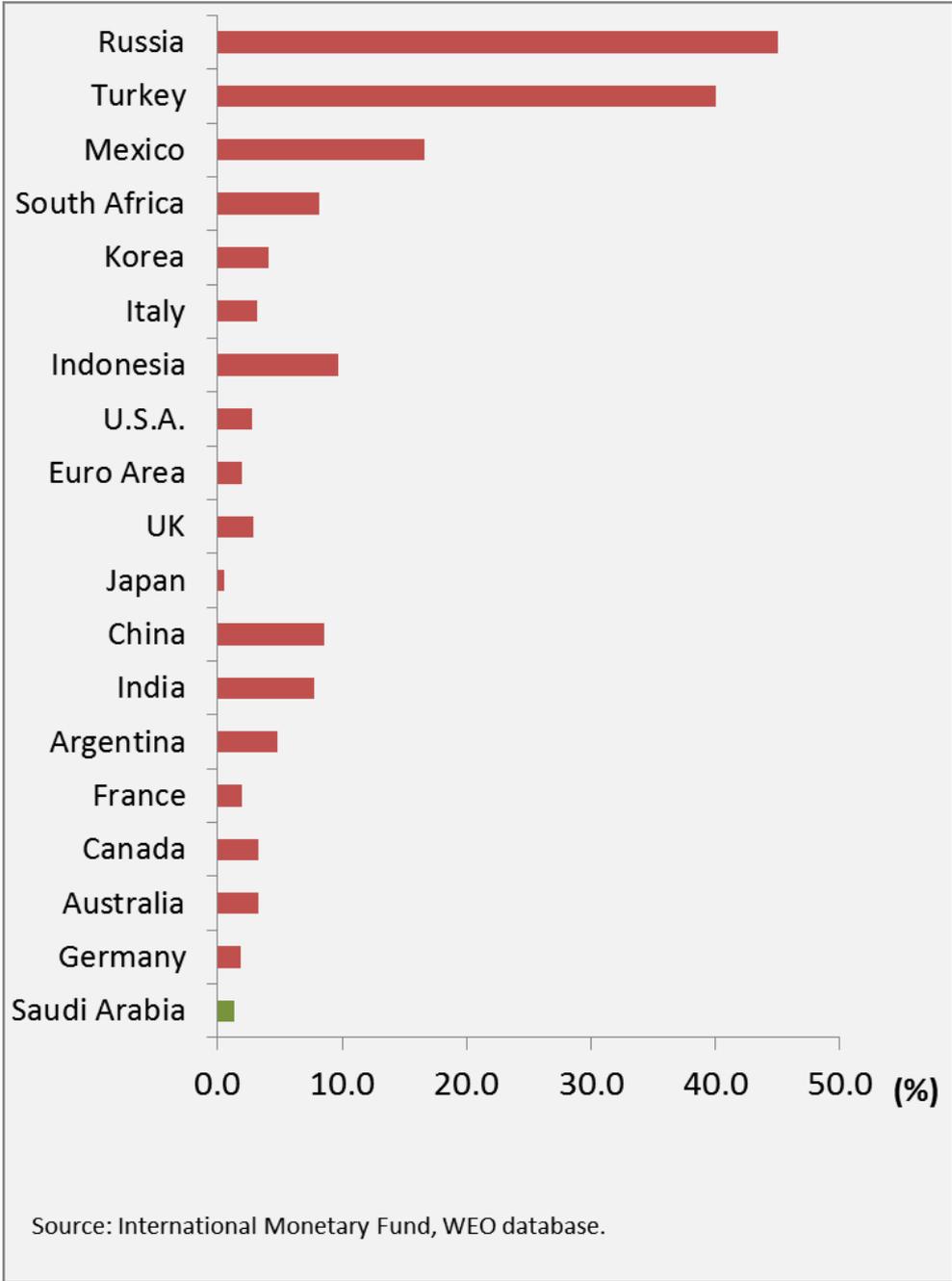
**Figure 5: Compound Annual Growth Rate (CAGR) of Real GDP
For the G-20 Nations – 1986-2014**



Due to the lack of data, the growth rates for the Euro Area and Russia start from 1991 and 1992, respectively.

Figure 6 shows the inflation rates for the G20 countries over the 1987-2015 period. Note that the rate for Brazil is missing, due to scaling problems caused by the extremely high CAGR of over 113 percent.

Figure 6: Inflation – Compound Annual Growth Rate (CAGR) of CPI for the G-20 Nations – 1986-2014



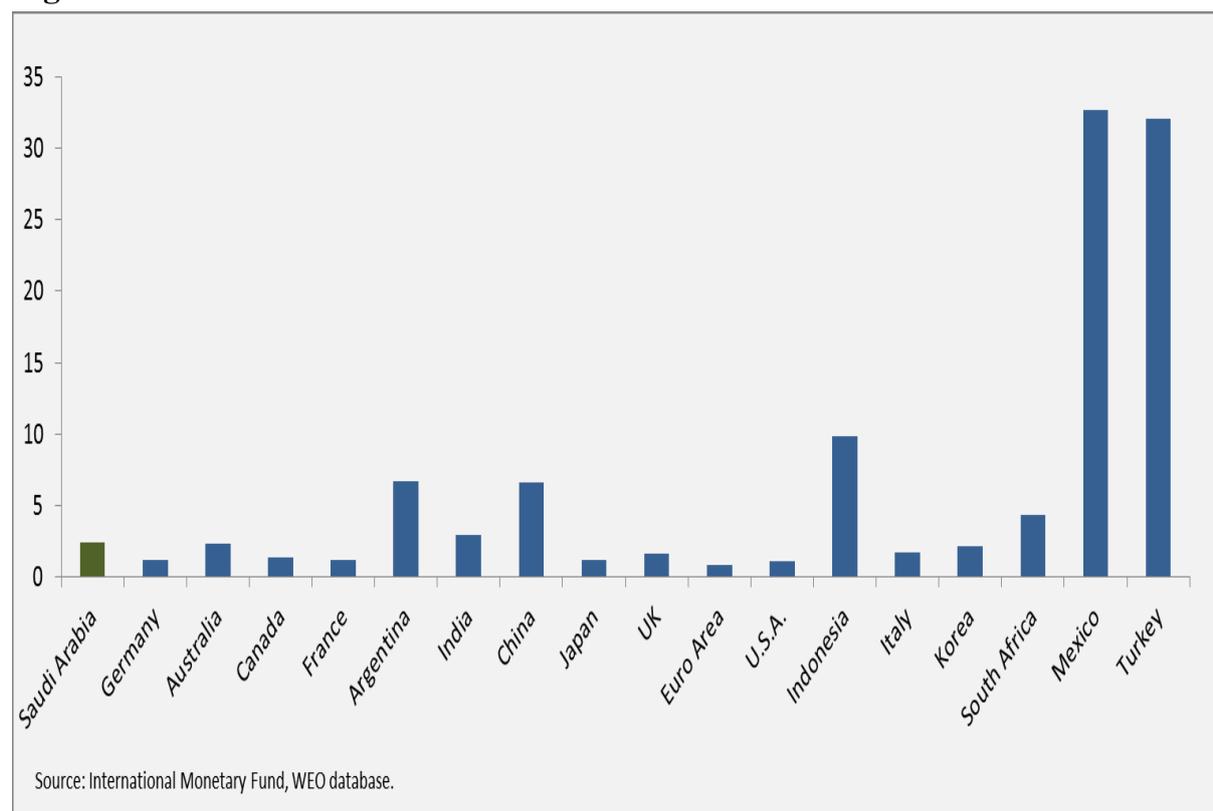
Due to the lack of data, the inflation rates for the Euro Area, Russia, and Argentina start from 1991, 1992, and 1997 respectively. Brazil's inflation rate of 113.1 percent has been omitted due to scaling problems.

Also note that Saudi Arabia had the second lowest inflation rate (as measured by the CAGR of the CPI) in the G-20, with Japan being the only country with a lower rate. Japan's low rate reflects the country's lingering issue with chronic deflation that has accompanied its multiple periods of very slow growth and multiple "mini-recessions."

In sharp contrast to the low inflation rates of Saudi Arabia and the major developed nations, the inflation rates for Mexico, Turkey, and Russia were in the double digit range. Brazil’s average inflation over the 28 year period was 113.1 percent, a reflection of the hyperinflation in the late 1980s and 1990s, with inflation peaking at 2948 percent in 1990. Obviously, this has skewed the analysis somewhat. In fact, it should be noted that the current inflation rates for all of the high inflation countries in this analysis are considerably lower than the average CAGRs over the 28 year period. For example, Brazil’s 2014 inflation was 6.3 percent, Russia’s was 7.8 percent, Turkey’s was 8.9 percent, and Mexico’s was 4.0 percent.

As can be seen from Figure 7, the standard deviation measurement of the variance in the inflation rate shows much the same pattern.

Figure 7: Standard Deviation of CPI Inflation for the G-20 Nations – 1986-2014



Due to the lack of data, the standard deviation calculations for the Euro Area, and Argentina use data beginning in 1991, 1992, and 1997 respectively. Brazil's and Russia's standard deviation measurements have been omitted due to scaling problems. Brazil's standard deviation was 760 percentage points and Russia's was 192 over the 28 year period, as indicated in Table 2 below.

Table 2: Compound Annual Growth Rate (CAGR) of Real GDP and CPI for the G-20 Nations: 1986-2014

Country	CAGR		Standard Deviation (S.D.)	
	GDP	CPI	S.D. of Real GDP Growth Rate	S.D. of Inflation
Saudi Arabia	4.0	1.4	3.6	2.5
Germany	1.8	1.9	2.2	1.2
Australia	3.2	3.3	1.3	2.3
Canada	2.4	3.2	1.8	1.4
France	1.8	2.0	1.6	1.2
Argentina	3.0	4.8	5.7	6.7
India	6.5	7.7	2.2	2.9
China	9.7	7.5	2.6	6.6
Japan	1.6	0.5	2.5	1.2
UK	2.2	2.8	2.0	1.7
Euro Area	1.4	2.0	1.8	0.8
U.S.A.	2.6	2.8	1.7	1.1
Indonesia	5.4	9.7	4.0	9.8
Italy	1.0	3.2	2.0	1.7
Korea	5.9	4.1	3.9	2.2
South Africa	2.5	8.2	2.0	4.3
Mexico	2.7	16.6	3.0	32.7
Turkey	4.1	40.0	4.6	32.0
Russia	1.8	45.0	6.3	192.2
Brazil	2.6	113.1	2.6	760.2

Source: Authorities; International Monetary Fund, International Financial Statistics.
Due to the lack of data, the GDP and CPI data for the Euro Area and Russia start from 1991 and 1992 respectively. The CPI data for Argentina starts from 1997.

One interesting analytical statistic is the difference between real GDP growth and inflation. A positive difference is an indication of better economic performance. For Saudi Arabia, the CAGR of real GDP was 2.6 percentage points greater than the CAGR of CPI (Table 2). In other words, its economic growth was considerably higher than its inflation rate. This is an indication that the pegged exchange rate regime has prevented strong growth from leading to higher inflation. Three other countries in the G-20 – China, Japan, and Korea – also showed positive differences; however, the Saudi differential was the largest.

4. Concluding Remarks

To assess whether the dollar pegged regime has served the Saudi economy well, this study uses cross-sectional analysis over homogenous countries (e.g., GCC) as well as the heterogeneous ones in the G-20 over the period from 1986 to 2014. The compound annual growth rate (CAGR) of real GDP and CPI across countries has shown that Saudi Arabia was among a select group of countries with good and stable output growth and moderate inflation.

Going forward, there are good arguments in favor of retaining the current fixed exchange rate regime especially in the near future, as the economy becomes more diversified. It has successfully dampened inflation and allowed for acceptable growth. Saudi Arabia's growth at a CAGR of 4.0 percent over a 28 year period is in the top quartile of G-20 members, so the dollar peg does not appear to have damaged growth. This view would be weaker if one expected a continuation of the depreciation of the dollar, an unacceptably high US inflation rate (which was the case in the late 1970s), or a diverging economic cycle relative to the United States. What is sure is that in a changing environment, a forward looking monitoring framework will be essential for pursuing the appropriate exchange regime. The decision for one or the other exchange rate regime depends ultimately on the structure of the economy as well as the policy objectives.

The overall findings based on the standard deviation of inflation and real GDP growth across countries have confirmed that Saudi Arabia has more stable economic

growth and inflation rates than those countries with similar economic structures with other exchange rate regimes. The bottom line is that the dollar peg has served Saudi Arabia well, and is likely to do so until Saudi Arabia becomes a meaningfully diversified economy, with exports denominated in a mix of currencies. The conclusions drawn in this paper will be of interest to policy makers, particularly those interested in examining the impact of different exchange rate policies on inflation and economic activities.

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