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## EXCHANGE RATE VOLATILITY: AN EMPIRICAL STUDY FOR STATE OF KUWAIT

*As an oil exporting nation Kuwait suffers from the well-known issue called the Resource Curse given the high reliance on oil revenues for economic growth and development. Traditionally research on small open economies such as Kuwait focus on versions of the Solow /Harrod/Domar growth models which are predominantly closed models which focus on exogenous growth issues such as saving ratios and the Solow Residual. For an open economy without core problems on capital accumulation, such as Kuwait, it is interesting to disentangle exchange rate volatility issues from key open economy fundamentals such as GDP growth, trade openness, inward foreign investment and exchange rate issues.*

*The purpose of this study is to empirically examine the impact of gross domestic product, trade openness and foreign direct investment on the exchange rate volatility of Kuwait. We have used several advanced statistical tools to better estimate different kinds of relationships. Results show that all factors are significant in determining exchange rate volatility.*

**Key words:** exchange rate, volatility, GDP, trade openness.

**Introduction.** Exchange rate volatility is of particular importance to those countries which are small and conduct large amounts of trade [4]. This is particularly relevant to Kuwait. Exchange rate movements have important implications for a firm's profitability and stock market valuations. Prasad A. [26] sets out three main ways in which exchange rate movements can affect firm value: namely; translation, transaction and competitive effects. He concludes that together these effects can be substantial for small economies with specialized trade flows. The significance for Kuwait, in this way, is clear. Indeed, Dominguez [14] argues that the elimination of exchange rate risk for European firms was one of the central motivations behind the Euro. Evidence of significant exposure to exchange rate volatility is reinforced by Bodnar G. [6] who found significant exchange rate exposure for 28% of all industries in the UK, Canada and Japan. Other studies, such as Amihud Y. [2], found a lag in the relationship between a firm's value and the exchange rate change. Amihud (ibid) argues that the complex relationship between firms and the exchange rates means that it took time for all of the implications of exchange rate movements to be analysed. In particular, Bartov E. conjectured that the lagged market response to changes in exchange rates are normal so that large bubbles can be expected when trade is highly open in all trade data.

After the downfall of the Bretton Woods arrangement, several academic and empirical studies have analyzed the association between exchange rate volatility and other macroeconomic factors. The impact of exchange rate variations can impact the overall economic system in the country. Uncertainty in exchange rates can be a significant barrier to trade, investment and in total economic activity among countries as a devaluation of a local currency may affect the overall income – absorption of the economy.

The motivation behind this study is to empirically investigate the impact of trade openness, foreign direct investment and gross domestic product impact on exchange rate variation. Based on the reviewed theories this study stands unique in terms of its econometric model and the econometric tools that we used during this research. It is of utmost importance to check how the economy of Kuwait is responds to exchange rate fluctuation with its possible income impacts on the economy.

Many papers have conducted studies to investigate the factors affecting exchange rate volatility and have used different methodologies to reach an answer. Using panel techniques, Holland M. et al [17] have shown for Brazil a more (less) volatile exchange rate has significant negative (positive) impact on economic growth. For Sudan, Ebadalla

E. [16] used GARCH to show that the volatility of the exchange rate has a positive impact on current account balance. For Nigeria, a simple OLS indicated that interest rate and rate of inflation have negative impact on economic growth but not significant [1]. In the GCC, a VECM revealed that the exchange rate volatility significant positively effects investments and other macroeconomic factors in GCC. [13]. Finally, Kuznobu H. and Fukonari K. [19] have also used VECM to show that intra-East Asian trade is discouraged by exchange rate volatility more seriously than trade in other regions. This could be because intermediate goods trade in production networks, which is quite sensitive to exchange rate volatility compared with other types of trade, occupies a significant fraction of trade

The objective of this study is to review the impact of GDP, TO and FDI on exchange rate of Kuwait.

**Methodology.** The volume of trade and the Balance of Payments is a vital macroeconomic fundamental that is heavily influenced by the prevailing exchange rate [11]. The effect is larger for small, highly open economies which are affected proportionally more by changes in international trade flows [4]. Once again, the Kuwaiti trade pattern falls into this category and is evident in the times series.

McKenzie M. [21] conducted a thorough empirical and theoretical study of the relationship between trade and exchange rate volatility but with mixed results such that no solid conclusions on the relationship could be determined. Moreover Phillips P.C. [25] argues that not all previous studies deal with non-stationary integrated variables satisfactorily, leading to spurious regressions.

Despite no clear, consistent relationship between exchange rates and trade at the international level there has been some success in studies of bilateral trade: Doyle E. [15] analysed the effects of exchange rate volatility on Irish exports to the UK between 1979 and 1992, finding that it was a significant determinant for 35% of the Irish-UK trade. Similar conclusions have been drawn in a number of studies investigating bilateral trade between developing countries: Brada J. [7], Cabarello R. [9] and Arize A. et al. [3] found exchange rate volatility to be significant in explaining trade flows and Balance of Payments issues in developing countries, indicating the importance of exchange rate regimes for developing countries. A reason for the significance of exchange rate volatility on trade is the narrow range of export goods from developing economies.

In econometric data analysis, it is essential that non-stationary variables are treated differently from stationary ones. Brooks C. [8] defines a series to be strictly stationary if "the distribution of its values remains the same as time progresses, implying that the probability that falls within a

particular interval is the same now as at any time in the past or the future."

Early studies by Yule G. [27] discovered that the regression of a non-stationary time series on another may produce a spurious regression, meaning it is imperative to test the time series for stationarity before commencing econometric testing. The predominant test of stationarity is the unit root test, pioneered by Dickey D. and Fuller W. [12].

The methodology uses times series analyses based around unit root tests and co-integration techniques which seek establish long run relationships between key variables which directly link to economic theory. Essentially these techniques seek to avoid creating spurious regressions based on unrelated variables. Moreover, the analysis goes on to develop a short run VECM for short run elasticities which reveal consistently viable results. The approach here follows the literature and achieves similar findings for Kuwait as discussed above. The positive income/ price elasticity effects noticed for East Asia trade is revealed in this study too. The fundamental drivers of exchange volatility are linked to the core fundamentals in ways predicted by the pure theory of exchange rate determination. We have used several econometric tools to empirically investigate the impact of GDP, TO and FDI on

exchange rate volatility of Kuwait. Study has used annual data from 1980 to 2015 obtained from World Development Indicators of World Bank. Based on existing literature we have used descriptive analysis to check the normality of data, augmented ADF for unit roots, Johansen co-integration used for long run relationship and VECM for short run relationship.

$$ER = \beta_0 + \beta_1GDP + \beta_2TO + \beta_3FDI$$

where; ER = Exchange rate GDP = Gross domestic product TO = Trade openness FDI = Foreign direct investment.

**Results.** The present study has used several statistical tools to analyze all possible linkage between exchange rate volatility and the other explanatory variables. To get optimal outcome from the data we have used normality testing followed by the augmented Dickey-Fuller unit root test. To identify any long run relationships, we have used the Johansen co-integration technique and used the vector error correction model (VECM) to test for short run relationships and the significance of the data.

Table 1 shows the results of the standard unit root test (\*significant at 5%). It clearly illustrates that, with the exception of TO, the majority of the variables are stationary at level.

**Table 1. Results of the Unit root test**

Variables	Null Hypothesis	Level I(0)	First Difference I(1)
ER	Stationary	-2,877635 (0,0582)	-5,472231* (0,0001)
GDP	Stationary	-0,371763 (0,9033)	-5,318762* (0,0001)
TO	Stationary	-3,549038* (0,0123)	-7,556895* (0,0000)
FDI	Stationary	-2,194831 (0,2116)	-7,043599* (0,0000)

Looking at the long run, table 2 shows the results of the Johansen co-integration test. used for long run relationships and VECM for the short run relationship.

**Table 2. Results of the Johansen Cointegration test**

Johansen Cointegration Test			
Hypothesis No of CE (s)	Trace Statistics	Critical Value	P-Value
None	51,765*	47,856	0,02
At Most 1	25,345	29,797	0,149
At Most 2	8,779	15,497	0,386
At Most 3	0,061	3,841	0,803

There is one co-integration equation in the model and a long run relationship exists.

Looking at the short run, table 3 shows the results VECM and it can be seen that all variables are significant.

**Table 3. Results of the VECM**

Long Run Variables	Coefficients	t-values
GDP	-0,018	-2,04
TO	2,28E-01	5,292
FD	3,90E-12	5,196

**Conclusion.** The objective of this study is to empirically examine the impact of Gross domestic product, Trade openness and Foreign Direct Investment on the exchange rate of Kuwait.

Several different empirical methods have been adopted in previous studies investigating volatility in exchange rate models. Many, including Meese R. [22, 23, 24] and Mark N. [20], used co-integration tests which had some strengths, especially since the Johansen (1992) paper improved the econometric methodology. However, this investigation developed a vector autoregressive model and included key variables like trade openness, foreign direct investment and GDP. This has not been developed for Kuwait before.

An Augmented Dickey-Fuller [12] (ADF) unit root tests were run to examine stationarity in the time-series sample. The first differences of the variables were taken to ensure that the variables are stationary. This investigation also conducted sub- tests using the model specified to isolate certain events. which could cause biased results. By isolating key periods of time, the investigation hopes to gain greater insight into the performance of the exchange rate model and the determinants of movements in Kuwait dinar exchange rate.

The ADF was then used, and the results showed that all variables under study are integrated at order one except for Trade Openness. The Johansen co-integration technique was used to examine long run relationships and it

shows that such a relationship exists. We have used the Vector Error Correction Model that produced significant results for all variables. Keeping in view all the results obtained, we can conclude that all factors are crucial to explain exchange fluctuation. However, our results indicate that Trade Openness is the most important variable that effect exchange rate at any stage. This is evident in the co integration of the vector which gives the pseudo elasticity for Gross domestic product, Trade openness and Foreign Direct Investment. The results show that if Kuwait increased. trade openness and attracted more foreign direct investment, exchange rate volatility would increase. The pure theory of exchange rate determination is in evidence in these results and could inform future policy initiatives. Policy makers are recommended to review FDI and TO as separate impact factors on the exchange rate and revisit the Kuwait policy stance. Future researchers could also consider other relevant factors like the current account balance in empirical studies.

As a small open economy Kuwait is subject to sudden changes in world prices of its exports. Long term this can cause serious terms of trade effects where the real exchange rate is dramatically affected. So paradoxically although exchange rate volatility is explained with the traditional pure theory paradigm, slight changes in the TO and FDI variables can cause asymmetrical effects with potentially large swings in the exchange rate. The VECM indicates this potential paradox and underlines that exchange rate issues in small open economies can have a huge impact on Balance of Payments positions even among oil exporters.

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### НЕСТАБІЛЬНІСТЬ ОБМІННОГО КУРСУ: ЕМПІРИЧНЕ ДОСЛІДЖЕННЯ ДЕРЖАВИ КУВЕЙТУ

*Як країна, що експортує нафту, Кувейт страждає від відомої проблеми, яка має назву "прокляття ресурсів", з огляду на високу залежність від надходжень від нафти для економічного зростання та розвитку. Традиційне дослідження невеликих відкритих економік, таких як Кувейт, зосереджено на версії моделей росту Solow /Harrod/ Domar, які є переважно закритими моделями, зосередженими на питаннях екзогенного зростання, таких як коефіцієнт економії та залишки Солоу. Для відкритої економіки без серйозних проблем накопичення капіталу, таких як Кувейт, цікаво розв'язати проблеми волатильності обмінного курсу з ключових основ відкритої економіки, таких як зростання ВВП, відкритість торгівлі, внутрішні іноземні інвестиції та проблеми обмінного курсу.*

*Метою цього дослідження є емпіричне вивчення впливу валового внутрішнього продукту, відкритості торгівлі та прямих іноземних інвестицій на нестабільність валютного курсу Кувейту. Для кращої оцінки різних видів відносин використано кілька передових статистичних інструментів. Результати показують, що всі чинники є значними при визначенні волатильності обмінного курсу.*

*Ключові слова: курс обміну, волатильність, ВВП, відкритість торгівлі.*

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### НЕСТАБИЛЬНОСТЬ ОБМЕННОГО КУРСА: ЭМПИРИЧЕСКОЕ ИССЛЕДОВАНИЕ ГОСУДАРСТВА КУВЕЙТ

*Как страна, которая экспортирует нефть, Кувейт страдает от известной проблемы, которая называется "проклятие ресурсов", учитывая высокую зависимость от поступлений от нефти для экономического роста и развития. Традиционно исследования небольших открытых экономик, таких как Кувейт, сосредоточены на версии модели роста Solow /Harrod/ Domar, которые являются преимущественно закрытыми моделями, сосредоточенными на вопросах экзогенного роста, таких как коэффициент экономии и остатки Солоу. Для открытой экономики без серьезных проблем накопления капитала, таких как Кувейт, интересно решить проблемы волатильности обменного курса из ключевых основ открытой экономики, таких как рост ВВП, открытость торговли, внутренние иностранные инвестиции и проблемы обменного курса.*

*Целью этого исследования является эмпирическое изучение влияния валового внутреннего продукта, открытости торговли и прямых иностранных инвестиций на нестабильность валютного курса Кувейта. Для лучшей оценки различных видов отношений использовано несколько передовых статистических инструментов. Результаты показывают, что все факторы являются значительными при определении волатильности обменного курса.*

*Ключевые слова:* курс обмена, волатильность, ВВП, открытость торговли.

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### THE INFLUENCE OF ORDOLIBERALISM IN EUROPE

*From the "sick man" of Europe, as it was called after the Second World War, Germany managed to become the greatest power on the continent. This was due to hard austerity policies that perfectly suited a hard working and rigorous population. In this article I want to analyze if ordoliberalism, the German form of social liberalism that led to the country's economic miracle in the 1950s, can be the saving solution for a continent in crisis. For a more complete analysis, I studied the subject from an economical, historical, political and social perspective. Following an extensive review of existing literature I have highlighted the doctrinal confrontation between ordoliberalism and keynesianism, brought back in the spotlight by the European sovereign debt crisis.*

*The German economic elite embrace ordoliberal values, characterized by responsibility and strict monetary rules. In response to the Eurozone crisis, they tried to spread the ordoliberal ideology across Europe. Focused on the supply side of the economy, the followers of ordoliberalism strongly opposed the expansionary fiscal and monetary policy. The power held in Europe allowed Germany to impose its own vision, centered on austerity and price stability. If ordoliberalism worked very well in Germany after the Second World War, not the same happened in the case of the Eurozone's economy. The rigor and lack of flexibility of German ordoliberalism have only further deepened the crisis and the economic problems of vulnerable countries.*

*Keywords:* ordoliberalism; keynesianism; Eurozone; crisis.

**Introduction. The history of ordoliberalism.** The theoretical foundations of ordoliberalism were set in the 1930s and 1940s by the Freiburg School and other thinkers whose intellectual influence went beyond German space. The most representative founders are Walter Eucken, Franz Böhm, Alfred Müller-Armack, Wilhelm Röpke and Ludwig Erhard. They outlined a conservative-liberal program as a response to the political and economic turmoil generated by the Weimar Republic and the Great Recession. In order to ensure the good functioning of the liberal market economy, the ordoliberals promoted a strong role for the state with respect to the market. As markets are not a "natural" phenomenon that works by itself, they need to be sustained and supported by the state. Markets work efficiently only if there is competition, but because competition is not spontaneous, the state must ensure it through norms and regulation. The two directions that ordoliberals focused on, were: dissolving economic power groups and regulating the economy without influencing the economic process.

Ordoliberalism opposed pure laissez-faire but not liberal values. The aim of their efforts was to achieve an economic and social reform program designed to "reconcile the immense advantages of the free market economy with the claims of social justice, stability, dispersal of power, fairness and the conditions of life and work which are proper to Man" [1, p. 45]. In other words, the freedom of individuals is carried out in a stricter legislative framework, but more concerned about social issues. Laws must be clear, non-interchangeable, impartial, and the state must ensure their compliance.

Ordoliberalism also opposed total interventionism characterized by economic planning, nationalization, and property erosion. The challenge was to find a middle path, that is, the state's optimal level of intervention, without the risk of too much intervention opening the way to collectivism or too little intervention to prove ineffective. Wilhelm Röpke divides state interventions into "compatible and incompatible... those that are in harmony with an economic structure based on the market, and those which are not". [2, p. 160] In his opinion, market-compatible interventions are those that do not intervene in the price formation mechanism, all the others will entail the need for new regulations and, in the end, the market will be taken over by the state.

Focused on the supply side of the economy, ordoliberals believed that output and employment are determined mainly by supply factors. They strongly opposed the expansionary fiscal and monetary policy in case of crisis, believing that the state's role is to maintain price stability. The fear of Germans over rising prices is justified by the hyperinflation experienced in 1929–1933. In 1914 the dollar was worth 4.20 marks but it reached 4.2 trillion marks in 1923 [3]. This hyperinflation almost destroyed Germany's economy and some say it created the right conditions for the rise of Adolf Hitler

For ordoliberals a good state is a strong state. The primary role of the state is to correct the imperfections of the economy from a social and moral perspective through a set of laws designed to ensure the order of the free market. Its responsibility is to create a framework of rules which provide the order that markets need to function freely and efficiently.