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Ateeqa Farooq and Bushra Yasmin

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EDITORIAL NOTE

Taking into account the recent major economic developments in the OIC member countries and the inter-linkages of these developments with those in both developing and developed countries as well as the world economy as a whole, this issue of the Journal of Economic Cooperation and Development – June 2017 analyses the trends in the major economic indicators of the OIC countries and the recent projections related to fiscal policy uncertainty and economic growth as well as the macroeconomic determinants of outward foreign direct investment. It highlights factors influencing youth's decision in entering formal and informal labour markets and investigates the benefits of a currency union to trade. This Issue also analyses the optimal choice of exchange rate regime and investigates whether there is a link between profit share rate of participation banks and interest rate. These economic indicators and issues have marked a challenge confronting the OIC member countries in the Middle East and Asia in their efforts to further their economic development and progress.

The first article examines the relationship between fiscal policy uncertainty and economic growth along with coherent input from financial sector development in Pakistan for the period of 1970-2011. The findings suggest that fiscal policy instability because of government expenditures; revenues generation and budget uncertainty have been abating the economic growth significantly in Pakistan. Particularly, the fiscal policy failure in generating revenues due to tax evasion and narrow tax base and its dependency on debt servicing to meet its expenditures induces the vulnerable budget.

The second article examines the home country macroeconomic determinants of Kuwait's outward foreign direct investment (OFDI) using country level time series data for Kuwait over the period (1976-2011). A comparison is also been conducted between the trends of the factors determining OFDI in Kuwait, Saudi Arabia, and Norway as counterparts of developing and developed oil producing countries. The study finds that the main macroeconomic determinants of Kuwait's OFDI are interest rate, inward foreign direct investment (IFDI), and public expenditure. The comparison shows that the trend of Kuwait's determinants of OFDI is partially consistent with the trend in Norway. This forms a critical phenomenon affecting Kuwait's overall economic performance. If the country's FDI outflows are controlling saving rate and hence domestic investment, the objective of FDI which is facilitating the country's investment and contributing to its economic growth is not achieved.

The third article attempts to uncover the factors influencing youth's choices into labour market in Egypt. Using the ILO's School-to-work transition survey

(Egypt, 2014) as the main source of data, this paper is trying to formulate a clear idea about the socio-economic and demographic background characteristics of both formal and informal sector workers. Informal sector workers are likely to be more male-dominant, younger, mostly reside in rural areas, poorly educated, have no-formal education or training experiences, have more children, comes from a financially poor families, and educationally less advantages parents. Education, place of residence, age at first marriage, parents' level of education, and principal work status made the greatest contribution in differentiating between the two groups and can be considered as the most predictor variables of the informal workers.

The fourth article assesses the benefits of a currency union by using the West African Monetary Zone (WAMZ) and the traditional gravity model approach. These model approaches are useful in checking the impact of a single currency on trade enhancement and the impact of the instability index on economic growth. The empirical findings supported the hypothesis that currency unions do have a significant positive impact on trade flows, which therefore leads to trade enhancement. Hence, Economic Community of West African States (ECOWAS), African Union (AU) and regional bodies need to have peace and stability as a top priority in their agenda. In doing so, peace will continue to prevail in the region which will create the conducive environment in enhancing trade among member countries.

The fifth article aims to evaluate the effect of using different pegging exchange rate regimes on the stability of the JD exchange rate adopted by Jordan in various foreign exchange rate systems. The study found that pegging to the IMF Special Drawing Rights was the best choice. This is so because this alternative would lead to more stability of the JD and local prices compared to other alternatives. This strategy achieves greater stability to the exchange rate of the JD and the domestic prices level, while it cuts down the cost of imports and the external debt.

The sixth and last article examines variables that affect profit share rate of participation banks and deposit interest rate of conventional banks over the period between January 2006 and May 2015 in Turkey. The profitability of conventional banks, government security, and foreign exchange rate are significantly effective on deposit interest rate settled by conventional banks. The interest rate is a benchmark for participation banks to determine the profit share rate. Therefore, this situation has increased the demand and orientation for Islamic finance as a substitute for the modern financial system. Both this case and the distance that is taken by Muslim countries in recent years have increased the share of Islamic banking/finance in the world.

Amb. Musa KULAKLIKAYA
Editor-in-chief

Fiscal Policy Uncertainty and Economic Growth in Pakistan: Role of Financial Development Indicators

Ateeqa Farooq¹ and Bushra Yasmin²

The macro-economic uncertainty has been considered crucial for economic growth in developing countries. Hypothetically, it threatens economic growth through its bearing on the investment pattern and future policy options. However, the financial sector development is expected to moderate the adverse effects of these uncertainties on the economic growth and can lead to fairly stable policy choices. This paper examines the relationship between fiscal policy uncertainty and economic growth along with coherent input from financial sector development in Pakistan for the period of 1970-2011, employing Auto-Regressive Distributed Lag (ARDL) approach to Co-integration. The findings suggest that fiscal policy instability on account of government expenditures, revenues generation and budget uncertainty have been abating the economic growth significantly in Pakistan. However, the relevance of financial development indicators as ratio of liquid liabilities and credit to private sector proved to be supportive in minimizing the said effect. Hence, the financial development should be promoted being pertinent in rendering high economic growth by offsetting the detrimental effects of fiscal policy uncertainties.

Keywords: Economic uncertainty, economic growth, fiscal policy instability, revenue generation, liquid liabilities, ARDL O4, H3, E4

1. Introduction

The importance of stable and predictable macroeconomic policies for a prosperous and sustainable economic growth has long been realized by the developing countries. Economic analysts accused economic

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uncertainty as one of the major cause of low economic growth of these economies. Pastor and Veronesi (2012) argued that the bad economic news creates uncertainty over the future government policies which results in immediate decline in investment and economic growth. Theoretically, the influence of economic uncertainty laid down its channel through marginal productivity theory where marginal productivity of capital is convex to particular uncertain variable and penetrates into the behavior of investment. Therefore, macro-economic uncertainty modifies the expected net value of marginal product of capital and ultimately contributes to changes in economic growth. Such investment behavior held responsible to generate economic uncertainty in foregoing and future predictability, as well. The support to the role of policy uncertainty in economic growth also comes from the line of literature by Lucas and Prescott (1971), Arrow (1968) and Caballero (1991). Hence, the economic uncertainty is an integral part of decision making which is precisely inclined to the investment decisions and renders strong implications for the economic growth.

The experience of developing countries in 1960s and 1970s highlighted the role of macroeconomic instability as fundamental in shattering economic growth. It also connotes the great recession that witnessed low economic recovery due to economic uncertainty (Baker et. al, 2012). The proclaimed instability has also become prevalent in Pakistan and its origin is reflected in different macro-economic policy indicators. This instability, inherited by macro-economic uncertainty, has its roots in the economic structure and development indicators. It is well argued that impact of monetary and fiscal policy is intensified in the presence of economic uncertainties and gets reflected in terms of lower economic growth mainly due to backward and unpredictable behavior of investment (Bernanke, 1983; Pindyck and Solimano, 1993 and Dixit and Pindyck, 1994).

The fiscal policy uncertainty is very critical in this regards. According to Chaudhry and Shabbir (2005), economic uncertainty is demonstrated in worsened fiscal policy in terms of budget uncertainty as the uncertain budget imposes restrictions and distributive risks for the subsequent fiscal years. Pakistan, Govt. of (2010) proclaimed that the economy of Pakistan has perennial budget uncertainty rolls from 2.3% to 1.9% in 1980s and fell from 3% in 1990s to 1.6% in 2000, due to rescheduling of debt services, a very upshot of uncertain budget.

Similarly, the uncertainty in revenue collection imparts irreversible investment and has long run consequences for economic growth (Atif, Shahab and Mehmood, 2012). The upheavals in political scene and IMF conditionality reinforce revenue generation uncertainty in Pakistan to 0.8% and 0.4% in 1980s and 1990s, respectively. Ultimately, the optimality of government expenditures is desirable for sustainable fiscal conditions. The conventional fiscal policy in Pakistan has subdued persistently by uncertain government expenditures as one of the failures of fiscal policy entailment. The uncertain government expenditures are expected to have negative shock on the economic growth and endeavors to the rising tax liabilities in near future. Precisely, such instabilities are more likely to prevail in the developing countries as reported by Kneller et.al. (1998).

Herewith, the role of financial sector pertains to the economic growth of the country. According to Aghion et al., (1999), since the financial sectors are less developed in developing countries these economies suffer more from volatility. The signaling behavior of financial development enriched with capital market perfections can issue equity under economic uncertainty and hence absorb the likely risks. The contribution of liquidity for financial development in Pakistan was ranged from 43.25% to 53.45% in 1973 and reached to 50.95% in 2007 inclined with promoting economic growth for policy makers.

The relationship between financial development and economic growth is primarily emphasized from development perspective of the economy. In that context, the focus of this study is to put an effort to provide empirical evidence on the influence of financial development as a conducive factor to scale down the effect of macro-economic uncertainty on economic growth in Pakistan. The study covers time period from 1970-2011 and is expected to deliver important policy recommendations.

The rest of the study is organized as follows; Section 2 deals with the review of existing literature; Section 3 provides brief overview of fiscal policy indicators along with financial sector development in Pakistan; Section 4 provides the methodology and data description; Section 5 deals with the empirical results and discussions and section 6

concludes the study with policy recommendations on the basis of findings.

2. Literature review

The available literature stresses on the economic uncertainty as an integral part of decision making being logical to the investment and have strong implications for significance of economic growth. The relationship between uncertainty and dynamics of investment laid down its foundation by contemporary work by Pindyck et al. (1993). The consensus exists on the threatening behavior of irreversible investment in relation to the marginal productivity theory reflects in the rise in uncertainty.³ The period apprehended by irreversible investment featured to entail sunk cost along with foregoing uncertainty and induces unpredictable macro-economic policies. Hence, the macroeconomic uncertainty affect economic growth by the backward and unpredictable behavior of investment (either public or private) as appraised by Bernanke (1983), Pindyck and Solimano (1993), Arrow (1968), Abel & Eberly (1994) and Caballero (1991).

Regarding the uncertainty issue, a number of studies examined the effect of uncertainty on investment at firm level, while Aizenman and Marion (1993) was first to integrate its effects from macro-economic perspective. For Pakistan, Fatima and Waheed (2011) examined the effect of macro-economic uncertainty on total investment and economic growth for the years 1975-2008 by using the accelerator model of investment and endogenous growth model. The finding indicates that macro-economic uncertainty has significantly negative effect on investment and per capita income. Economic uncertainty as a part of budget deficit create loop holes in deficit financing behind immature coerce of government to meet its expenditures and left adverse consequences in the form of high inflation, current account deficit and crowding out of private investment (Chaudhry and Abe, 1999). Hence, the deficit resultantly is not sustainable (Chaudhry and Ahmed, 1995). The optimality of government expenditures is desirable for the sustainable fiscal conditions. Moreover, Henrekson (1993)

³ Where irreversible investment comes into existence after the threshold cross of marginal rate of productivity of capital.

claimed that the dilemma of uncertain government expenditures reduces total factor productivity and impedes economic growth.

The linkage between financial development and macroeconomic volatility is supported in the empirical evidence both for the developing and developed countries. Financial development is able to reduce liquidity risk and increases investment efficiency. The ascertained research indicates that countries with more developed financial sector can diversify risks of economic uncertainty than countries with less developed financial sector. The studies by Lensink et al. (2001) and Aizenman and Marion (1993) suggested that the unstable government policy hurt economic growth more in the countries with poor developed financial sector.⁴ The standardized bank-based financial sector by extending loan facilities fosters economic growth through rapid accumulation of monetary services.

Conclusively, the studies so far carried out distinctly for the relationship between uncertainties, financial development and economic growth but a dearth in the studies is observed which incorporates major fiscal policy uncertainties in undermining the economic growth keeping into account the role of financial development indicators. Therefore, this paper can be a significant contributor to the existing literature, particularly for Pakistan.

3. Fiscal Measures Uncertainty and Financial Sector Development Briefs in Pakistan

The concurrence of macroeconomic uncertainty in Pakistan, although persistent, but mostly overlooked by the policy makers. The volatile macro-economic performance from fiscal front is due to low tax collection as proportion of national income and irrational expenditure behavior. The volatility was observed at 1.4 % in revenue generation for the year 1970-71 but later declined and fluctuated around 0.8 % and 0.4 % in 1980s and 1990s, respectively. According to Pakistan, Govt. of (2010), since inception perennial and persistent fiscal deficits

⁴ This proposes an avenue to aspicate the effect of financial sector development for significance of economic growth.

have been observed varying from as low as 2.9 percent to as high as 12.2 percent of GDP.

Similarly, budget uncertainty was at 2.3% in 1970 and the major shortfall recorded in the year 1976 due to the interruption after civil war and nationalization policies. The deficit revolved around 5 percent of GDP since 1980-81 (Ishfaq and Chaudhry, 1999). It again fell to 1.9 % in 1980s due to rising interest burden and high defense spending and again rolls on 2.6% in 2011. Likewise, the optimal government expenditures are much lower than the current size of government expenditures and persist at 2.2% in 1970s and 5.9% in 1989. Meanwhile, the expenditures contracted to 0.51% in 1996 and 1.57% in 2005 and then sustained at 4.25% and 7.95% in 2007 and 2011, respectively.

Turning towards financial development indicators, the financial deepening persisted at 41.86% in 1970s and 1980s and was increased to 44.22% in 1990s. A sharp rise has been observed later since 1999 from 39.6 % to 50.5 % in 2006-07 indicating a groovy job by the financial reforms in Pakistan (Pakistan, Govt. of (2010). Besides, the liquid liabilities redeem contribution for financial development on average of 43.25% and 44.94% in 1970s and 1990s, respectively that ultimately reached to 50.9% in year 2007. The performance of credit to private sector is worth mentioning and shows encouraging trend from 23.84% in 1970 to 25.92% in 1980s. This completes the discussion on the factual trend in fiscal policy uncertainty and financial development indicators in Pakistan. Now, we turn to the methodology adopted to encounter the research objectives.

4. Model Specification and Data Description

4.1 Theoretical Framework

The dynamic analysis of economic growth follows the traditional Solow Growth model (1956). The augmented Solow model offsets with constant returns to scale production function where output is a function of capital (physical and human) and augmented labor. The production function is given as:

$$Y_{(t)} = K_{(t)}^{\alpha} (A_{(t)} L_{(t)})^{1-\alpha-\beta} \quad (1)$$

Where α and β are parameters and $A_{(t)} L_{(t)}$ refers to the effective labor. The equilibrium of physical and human capital of a country is given as equation (2) and (3), respectively:⁵

$$k_t^* = \left(\frac{sk_t^{1-\beta} sh_t^{\beta}}{n+g+\delta} \right)^{\frac{1}{1-\alpha-\beta}} \quad (2)$$

$$h_t^* = \left(\frac{sk_t^{\alpha} sh_t^{1-\alpha}}{n+g+\delta} \right)^{\frac{1}{1-\alpha-\beta}} \quad (3)$$

By substituting equation (2) and (3) in the production function simultaneously, the growth model for a country can be written as:

$$y_{(t)}^* = \frac{Y_{(t)}}{L_{(t)}} = A_{(t)} \left(\frac{sk_t}{n+g+\delta} \right)^{\frac{\alpha}{1-\alpha-\beta}} \left(\frac{sh_t}{n+g+\delta} \right)^{\frac{\beta}{1-\alpha-\beta}} \quad (4)$$

Hence, the economic growth of a country virtually depends on the role of physical and human capital to ascertain its dynamic analysis along with other underlying determinants per research objectives.

4.2 Empirical Model

The empirical model is developed by modifying the growth model to ascertain that whether possible growth reducing effects of economic uncertainty may be realized by the intimidating role of financial sector development. The final equation to be estimated, following Lensink, R (2001), is given below:

$$GDP_t = \alpha_1 + \alpha_2 K_t + \alpha_3 H_t + \alpha_4 UNC_t + \alpha_5 UNC_t * FD_t + u_t \quad (5)$$

Where, *GDP* refers to the real *Gross Domestic Product*. The human capital (*H*) is measured by using proxy variables of higher education enrollment ratio, secondary school enrollment ratio and literacy rate. Capital (*K*) is the measure of physical capital stock, which is the

⁵ See Takahashi (2012) for reference.

endowment of an economy and productivity deployed to produce flow of goods and services (GDP). Since the data for physical capital is not available directly, it is measured from the following formula.⁶⁷

$$K_t = I_{t-1} + (1 - \delta)K_{t-1}$$

Where, I is the gross fixed capital formation, data collected from *World Development Indicators*, δ_t is the depreciation rate and K is the capital stock.

UNC refers to the macroeconomic uncertainty measured by the volatility in budget, revenue generation and government expenditures. Similarly, *FD* stands for the financial development and is measured by three indicators namely; money and quasi-money to GDP ratio (MDP) which quantifies the size of financial deepening in the economy, credit to the private sector as percentage of GDP (CDP) that entails total amount of credit/loans provided to the private sector and liquid liabilities (M3) as percentage of GDP (LIQ) that is comprised of demand and interest bearing financial obligations. The interaction term of all constructed financial development indicators with macroeconomic uncertainty are included to empirically capture that whether financial sector development significantly mitigates the effect of economic uncertainty on economic growth. The analysis covers the period from 1970-2011 for Pakistan.

The data for financial development indicators are collected from the *World Development Indicators* (2011), World Bank Database. The data for economic growth, inflation rate, real interest rate, exports and real effective exchange rate are collected from *Monthly Statistical Bulletin* (2011), Pakistan Bureau of Statistics, respectively. The data for human capital is taken from *Labor Force Survey of Pakistan* (2011), published by the Pakistan Bureau of Statistics. While, the data on the fiscal

⁶ The method for measurement of physical capital stock is taken from steady state and neo-classical growth model approximated by growth rate of investment as referred by Harberger (1978).

⁷ As the model uses variables as the log differenced in final estimation, they implicitly demonstrate the relative/percent changes in dependent variable with respect to independent variables and henceforth, the GDP refers to the growth rate, technically.

policy measures is collected from the *Economic Survey of Pakistan* (2011), published by Ministry of Finance, Government of Pakistan.

4.3 Measuring Fiscal Policy Uncertainty

In empirical analysis, the measurement of uncertainty has remained an important concern. The most robust approach to estimate uncertainty, keeping in view the violent behavior of uncertainty that is related with the expectation not with the actual outcomes, ex-ante measure of General Autoregressive Conditional Heteroscedasticity (GARCH) is recommended. The standard approach considered the GARCH(1,1) model for fiscal policy uncertainty and is given by following equation:

$$Y_t = X_t \theta + \epsilon_t$$

$$\sigma_t^2 = \omega + \delta \epsilon_{t-1}^2 + \gamma \sigma_{t-1}^2$$

Where σ_t^2 is one period ahead forecast variance based on past information and is termed as conditional variance.

$a_1 a_3 a_4 e_t$ The economic uncertainty is expected to have significant negative relationship with economic growth as underscored in literature.⁸

4.4 Estimation Technique: Autoregressive Distributed Lag Approach to Co-integration

Pesaren and Shin (1999) developed Auto Regressive Distributive Lag Model (ARDL) to investigate the existence of co-integration and the long-run relationship between variables. The specified variables and their lags when added to auto regression, tend to generate autoregressive distributed lag model.

⁸See Prescott (1971), Arrow (1968), Caballero (1991), Abel and Eberly (1994) and Lensink and Sterken (2001) for reference.

The model is specified as:

$$Y_t = \mu + \sum_{i=1}^p Y_i Y_{t-i} + \sum_{j=0}^r \beta_j X_{t-j} + \delta W_t + \varepsilon_t \quad (1)$$

Where, μ is a vector of constant (μ_y, μ_x) . β is a matrix of Vector Autoregressive (VAR) estimates. A pair of series X_t and Y_t may be integrated at order I (0) and I (1). The time series vector X includes physical capital, human capital, fiscal policy uncertainty indicators and financial development indicators. The error term ε_t is assumed to be serially uncorrelated and vector $\varepsilon_t = (\varepsilon_{y,t}, \varepsilon_{x,t}) \approx N(0, \Omega)$ where Ω is positive and definite and t is time vector. The assumption of ARDL model is that errors have conditional mean of zero given all past values

$$\text{i.e. } E(u_t / Y_{t-1}, Y_{t-2}, \dots, X_{t-1}, X_{t-2}, \dots) = 0$$

4.4.1 Bound Testing Approach

The ARDL bounds testing approach to co-integration uses $(p+1)^k$ to estimate the number of regressions. Where, p indicates the maximum number of lags used and k refers to the total number of variables. The order p in an auto-regression is selected on the basis of appropriate lags to avoid biasness.⁹ The minimized residual's square on the basis of Schwarz Information Criterion (SIC) is given as:

$$SIC_{(p)} = \ln\left(\frac{SSR_{(p)}}{T}\right) + (p+1) \frac{\ln T}{T} \quad (2)$$

Where, $SSR_{(p)}$ is the sum of squared residuals and the lag length is selected using the minimum values of SBC.

The standard Vector Error Correction Model (VECM) is given as:

$$\Delta Y_t = \mu + \alpha_t + \lambda Y_{t-1} + \sum_{i=1}^{p-i} \gamma_t \Delta Y_{t-i} + \sum_{j=1}^{r-j} \gamma_t \Delta X_{t-j} + \varepsilon_t \quad (3)$$

⁹ If the order of estimated regression is too low, the valuable information in the more distant lagged values is lost. If order is too high more coefficients are estimated than necessary which produces estimation error in forecasts.

The F-test is used to test the existence of long-run relationship with following hypothesis:¹⁰

$$\begin{aligned} H_0: \lambda_1 = \lambda_2 = \lambda_3 = \lambda_4 = \lambda_5 = 0 \\ H_1: \lambda_1 \neq \lambda_2 \neq \lambda_3 \neq \lambda_4 \neq \lambda_5 \neq 0 \end{aligned}$$

In the second step, following long run model is estimated:

$$\Delta(gdp)_t = \alpha_1 + \sum_{i=1}^n \beta_i \Delta(gdp)_{t-i} + \sum_{j=1}^n \beta_j \Delta(K)_{t-j} + \sum_{j=1}^n \delta_j \Delta(H)_{t-j} + \sum_{j=1}^n \varpi_j \Delta(Uncertainty)_{t-j} + \sum_{j=1}^n \varrho_j \Delta(Uncertainty * FinDev)_{t-j} + \varepsilon_i \quad (4)$$

Subsequently, the Error Correction Model (ECM) is estimated to suggest the speed of adjustment towards long run equilibrium and also to evaluate the short run dynamics of model. The standard error correction representation of ARDL model is given as:

$$\begin{aligned} \Delta(gdp)_t = \lambda_1 + \delta_1 (ECM)_{t-1} + \sum_{i=1}^n \alpha_i \Delta(gdp)_{t-i} + \sum_{j=1}^n \beta_j \Delta(K)_{t-j} + \\ \sum_{j=1}^n \varphi_j \Delta(H)_{t-j} + \sum_{j=1}^n \varpi_j \Delta(Uncertainty)_{t-j} + \\ \sum_{j=1}^n [\varrho_j \Delta(Uncertainty * FinDev)]_{t-j} + \varepsilon_i \end{aligned} \quad (5)$$

Where, $(ECM)_{t-1}$ is lagged ECM of the model, δ is its coefficient that shows the speed of adjustment and ε_i is the random error with zero mean and finite covariance matrix. In order to ascertain the goodness of fit the diagnostic test including Breusch-Godfrey LM and J-B normality test is conducted to check the serial autocorrelation and normality assumption of CLRM, respectively.

5. Empirical Results and Discussion

An intensifying feature of time series data, dominated by stochastic trends and examined by Augmented Dickey Fuller (ADF) test,

¹⁰ Null hypothesis is evaluated through the significance of lagged variables by computed F-statistics. If it exceeds the upper critical bound (UCB), then the series are co-integrated; if it is below the lower critical bound (LCB), there is no co-integration and if in between the UCB and the LCB, co-integration remain inconclusive. The critical bounds are taken from Pesaren and Shin (1999).

determines the stationary of variables.¹¹ The orders of integration for respective series are reported in Table 5.1.

Table 5.1: ADF Unit Root Test

Variables	Level		1 st Difference		Integration order
	statistic	p-value	statistic	p-value	
LGDP	-0.252	0.989	-4.835	0.001	I(1)
LK	-6.406	0.000	-13.10	0.000	I(0)
LH	-6.069	0.000	-9.954	0.000	I(0)
Ltax	-14.91	0.000	-23.51	0.000	I(0)
Lbud	-3.33	0.074	-7.892	0.000	I(0)
Lep	-2.27	0.438	-8.52	0.000	I(1)
CDP	-3.305	0.080	-4.913	0.001	I(0)
MDP	-4.744	0.002	-6.165	0.000	I(0)
LIQ	-4.890	0.001	-7.118	0.000	I(0)

Note: ADF is applied with intercept and trend option.

Table 5.1 shows that all the variables follow a combination of the integration order of I (0) and I (1) as natural log of capital stock (*K*), human capital (*H*), tax revenue (*tax*), budget deficit (*bud*), credit to private sector (*CDP*), money and quasi money to GDP (*MDP*), liquid liabilities (*LIQ*) are stationary at level while GDP and government expenditures (*ep*) have unit root and became stationary at first difference.

Subsequently, the Bound-testing approach to Cointegration ascertains the existence of long-run relationship among the selected variables. At first, the lag order on the basis of Schwarz-Bayesian criteria (SBC) is selected at one. The results for Bound test for the existence of co-integration are reported in table 5.2.

¹¹ Presuming the presence of structural instability in the model Clemente Montanes Unit root test was applied but didn't depict significant structural breaks deliberately for all variables. Hence, the ADF results are reported for unit root test for its more relevance.

Table 5.2: Bound Test for Co-integration

Dep. variable: LGDP	Credit to Private Sector			Liquid Liabilities			Money and Quasi Money		
	Lep	Ltax	Lbud	Lep	Ltax	Lbud	Lep	Ltax	Lbud
F-Statistic	4.938	6.477	5.408	5.289	6.003	6.003	5.171	5.522	5.332
Upper Bound Critical value (90%)	3.794	3.831	3.831	3.794	3.831	3.831	3.794	3.831	3.831
Conclusion	H ₀ rejected and Co-integration exists for all variables.								

Note: All equations are estimated with three financial indicators namely; credit to private sector, money and quasi money to GDP and liquid liabilities with other selected variables.

It is concluded from the findings reported above that the application of bound test for co-integration remains valid and the null hypothesis for no long-run relationship is rejected for all equations.

The results for ARDL approach to Cointegration for each fiscal policy indicator are reported in section 5.1, 5.2 and 5.3. Overall, the results are satisfactory and in line with theoretical expectation. The results of diagnostic test including Lagrange Multiplier (LM) test of autocorrelation suggests that residuals are not serially correlated and Jarque-Normality test submits that errors are normally distributed for all estimated equations. These tests validate the robustness of estimates obtained from ARDL equations.

5.1 Results for Uncertain Government Expenditures and Financial Development

The ARDL results for the long-run cointegrating relationship and Error Correction Model are reported in Table 5.3, with real GDP as dependent variable, capital stock (K), human capital (H), government expenditures volatility (Lep) and its interaction term with financial development indicators.

Table 5.3: Empirical Results of Government Expenditures Uncertainty

Long Run Coefficients						
ARDL(1,0,0,0) based on Schwarz Bayesian Criterion						
Dependent Variable: (Lgdp)						
Variables	Eq. (1) CDP		Eq. (2) MDP		Eq. (3) LIQ	
	Coefficient	Std. error	Coefficient	Std. error	Coefficient t	Std. error
Constant	15.54***	0.48	16.32***	0.31	16.08***	0.27
LK	0.302***	0.01	0.30***	0.01	0.31***	0.01
LH	0.01	0.01	0.01	0.01	0.020**	0.01
Lep	-0.279*	0.15	-1.16	0.97	-0.063**	0.03
Lep*fin.dev	0.271*	0.15	0.30	0.25	0.023**	0.01
Error Correction ARDL Model						
ΔLK_t	0.054***	0.01	0.05***	0.01	0.055***	0.01
ΔLH_t	0.001***	0.001	0.002**	0.001	0.003***	0.001
ΔLep_t	-0.05**	0.02	-0.19	0.15	-0.011**	0.005
$\Delta Lep * fin.dev_t$	0.048**	0.02	0.05	0.04	0.004***	0.001
ECM_{t-1}	-0.179***	0.04	-0.16***	0.03	-0.175***	0.03
Diagnostic tests						
Serial correlation (LM Test)	0.009 (0.9)		0.50 (0.4)		0.021 (0.8)	
Normality Test	$\chi^2 = 0.264$ (0.8)		$\chi^2 = 0.60$ (0.7)		$\chi^2 = 0.040$ (0.9)	

Notes:1) *, **, *** indicate significance at 10 %, 5 % level and 1 % level of significance, respectively.

2) p-values are reported in parenthesis of diagnostic tests.

Equation (1) yields statistically significant and positive impact of physical capital on economic growth. Specifically, this indicates that 1% increase in capital stock brings about 0.302% increase in real GDP. This demonstrates that the main source of economic growth is capital accumulation as also encountered by standard growth models. Similarly in other equations, capital stock has appeared as significantly positive and renders the physical capital as a strong contributor in GDP, bearing highest magnitude among all the explanatory variables.

The coefficient for human capital index appeared as statistically insignificant for equation (1) and (2) but it has appeared statistically significant and positive in equation (3) highlighting that economic growth copped with higher level of educational attainment as it increases the workers' productivity, once the model is controlled for the liquid liabilities.¹²

Returning to the results from equation (1), the uncertain government expenditures have statistically significant and negative effect on the economic growth indicating 0.279 % decline in real GDP occurring by 1% increase in the government expenditures' uncertainty. The justification lies with the irrational government spending which disrupts the macroeconomic equalizers of the economy. Moreover, the volatile government expenditures leaves less resource for development due to huge borrowing for non-development expenditures which further curtails the development process.

The inclusion of financial sector development measured by credit to private sector with uncertain government expenditures shows that 1 % increase in credit to private sector tends to reverse the negative effect of economic uncertainty and raises real GDP by 0.27%. The finding supports the significance and dominance of financial sector development for economic growth by Lensink et al. (2001). The influence of credit to private sector possibly enhances mobilization of savings and expands the economic opportunities as also identified by Levine (1997).

Additionally, the uncertain government expenditures along with financial indicator of liquid liabilities as % of GDP reported in equation (3) shows that 1% increase in liquid liabilities squeezes the negative effect of uncertain government expenditures and raise real GDP by 0.023%. This indicates the relevancy of financial intermediaries for bearing financial obligations in liquid assets as emerging in developing countries. The liquid liabilities help in financial deepening and reduce uncertainty by provision of secured investment portfolio in liquid assets. It is also empirically proved by

¹² The study also used secondary school enrollment ratio and literacy rate but appeared insignificant, as well.

Baks and Crammer (1999) that liquidity increases the equity returns and minimize the risks and uncertainty associated with recession and helps predicting future advancement in economic growth. Hence, it can be argued that financial development can reverse the negative effects of government expenditure uncertainty. However, the results from the third indicator of financial development i.e., money to GDP ratio do not display any significance for government expenditures uncertainty and interaction term in explaining growth behavior.

The coefficient of ECM_{t-1} (-0.179) shows that deviation of long run economic growth corrected by 17.97% over each year. This term is negative and statistically significant at 1% level of significance which in turn determines the existence of model's stability and shows that the error correction process converges monotonically to the equilibrium path.

As the uncertain government expenditures get transfers to the budget uncertainty, its link with economic growth controlling for the financial development is discussed in next section.

5.2 Results for Budget Uncertainty and Financial Development

The estimated long run coefficients integrating budget uncertainty and the role of financial development indicators to economic growth are reported in Table 5.4.

Table 5.4: Empirical Results of Budget Uncertainty

Long Run Estimates						
ARDL(1,1,0,0,1) based on Schwarz Bayesian Criterion Dependent Variable: (Lgdp)						
Variables	Eq. (1) CDP		Eq. (2) MDP		Eq. (3) LIQ	
	Coefficient	Std error	Coefficient	Std error	Coefficient	Std error
Constant	17.66***	0.46	17.60***	0.46	17.61***	0.41
LK	0.279***	0.01	0.280***	0.01	0.290***	0.01
LH	0.011	0.01	0.012	0.01	0.014	0.01
Lbud	-0.273***	0.10	- 0.258***	0.10	- 0.362***	0.11
Lbud*fin.dev	0.069***	0.02	0.055***	0.02	0.073***	0.02
Error Correction ARDL Model						
ΔLK_t	0.72	0.68	0.802	0.69	0.553	0.65
ΔLH_t	0.001	0.001	0.001	0.001	0.001	0.001
$\Delta Lbud_t$	-0.03***	0.01	- 0.037***	0.01	- 0.047***	0.01
$\Delta Lbud$ * <i>fin.dev</i> _t	0.006***	0.002	0.005**	0.002	0.006	0.001
ECM_{t-1}	-0.144***	0.02	- 0.145***	0.02	-0.130	0.02
Diagnostic tests						
Serial correlation (LM Test)	0.14 (0.70)		0.24 (0.62)		0.11 (0.73)	
Normality Test	$\chi^2 = 0.88$ (0.64)		$\chi^2 = 0.78$ (0.67)		$\chi^2 = 0.47$ (0.78)	

Notes:1) *, **, *** indicate significance at 10%, 5% level and 1% level of significance, respectively.

2) p-values are reported in parenthesis of diagnostic tests.

The estimated coefficients of capital stock in Table 5.4 appeared as statistically significantly positive for all equations. The budget uncertainty yields statistically significant and negative influence on economic growth indicating that a 1% increase in budget uncertainty

brings about 0.273% decline in real GDP according to equation (1). This declining effect of budget uncertainty is due to failure of government policies to meet its expenditures resulting in unsustainable budget. The revenue gap is responsible for the long run budget uncertainty as acquainted by Siddique and Illyas (2011) for Pakistan. Hence, uncertain budgetary targets compress economic growth and delivers huge debt servicing in order to meet the loss of receipts thus exaggerating the distortions in economic growth.

The inclusion of all financial development indicators with the uncertainty measures appeared as significantly positive for economic growth. The credit to private sector reduces the budget uncertainty effect on economic growth as 1% increase in credit raises it by 0.069%. The financial sector is considered as source of 'easy' resources for the public budget as indicated by Roubini and Sala-i-Martin (1992). This means that government is able to follow policies of financial repression and can increase revenues through seigniorage taxation, thus assorting to minimize budget uncertainty. State Bank of Pakistan (2011) declared that budgetary borrowing from domestic financial institutions instead of external finance raises net domestic assets and reduces the uncertainty effects.

Similarly, the money and quasi money to GDP has statistically significant and positive impact on the economic growth showing that 1% increase in this ratio leads to increase real GDP by 0.055% and depresses the uncertainty effect by raising currency and demand deposits of central government. Hence, it strengthens the amount of financial resources in the economy by contributing in financial deepening and mortify the uncertainty effects. Additionally, liquidity has strong effect by raising real GDP by 0.073% and nullifies the reducing effect of -0.362% . The evidence shows that the reliance of government shifted to accumulate liquid assets as supporter of financial development which helps in debt servicing to diversify the loss of long run budgetary uncertainty.¹³

¹³ In this regards, the findings from this study highlights the emerging stance of monetary policy concerns to support fiscal policy measures.

The error correction term (-0.14) as reported in Table 5.4, shows that deviation from the long run equilibrium is adjusted by 14% over each year which in turn determines the existence of model's stability.

5.3 Results for Revenue Generation Uncertainty and Financial Development

The budgetary uncertainty is inclined with gaps in revenues generation capacity. A stable and consistent flow of tax revenues are required to carry on the development projects. The effect of tax revenue generation uncertainty on economic growth along with financial development is reported in Table 5.5.

Table 5.5: Empirical Results of Revenue Generation Uncertainty

Long Run Estimates						
ARDL(1,1,0,0,0) based on Schwarz Bayesian Criterion						
Dependent Variable: (Lgdp)						
Variables	Eq. (1) CDP		Eq. (2) MDP		Eq. (3) LIQ	
	Coefficient	Std. error	Coefficient	Std. error	Coefficient	Std. error
Constant	17.01***	0.58	17.00***	0.59	17.09***	0.6
LK	0.28***	0.01	0.28***	0.01	0.29***	0.01
LH	0.01	0.01	0.01	0.01	0.02**	0.01
Ltax	-0.93*	0.51	-0.62	0.68	-0.48	0.36
Ltax*fin.dev	0.27*	0.15	0.13	0.17	0.03***	0.01
Error Correction ARDL Model						
ΔLK_t	0.392	0.85	0.95	0.83	0.75	0.75
ΔLH_t	0.001	0.001	0.002**	0.001	0.003***	0.001
$\Delta Ltax_t$	-0.14*	0.08	-0.98***	0.11	-0.07	0.05
$\Delta Ltax$ $* fin.dev_t$	0.04**	0.02	0.02	0.02	0.005**	0.002
ECM_{t-1}	-0.15***	0.03	-0.15***	0.03	-0.14***	0.03
Diagnostic tests						
Serial correlation (LM Test)	0.17 (0.67)		0.07 (0.7)		0.06 (0.8)	
Normality Test	$\chi^2 = 0.22$ (0.89)		$\chi^2 = 0.41$ (0.8)		$\chi^2 = 0.39$ (0.8)	

Note1) *, **, *** indicate significance at 10%, 5% level and 1% level of significance, respectively.

2) p-values are reported in parenthesis of diagnostic tests.

The long run estimates of capital and human capital are positive as appeared in all estimated equations. The role of capital stock as major factor input in economic growth is demonstrated by the findings. However, it appeared as insignificant for human capital in first two equations as was the case with the results reported in Table 5.3.

The uncertainty of tax revenue generation has statistically significant and negative effect on economic growth and indicates that 1% increase in tax revenue uncertainty reduces real GDP by 0.93%, 0.62% and 0.48% in three equations, respectively. The rise in revenue generation uncertainty gets associated with uneven contribution of the economy in revenue collection. Specifically, for income and corporate taxes this uncertainty abrupt the pattern of irreversible investment and dispirited economic growth as noted by Atif, Shahab and Mehmood (2012). The persistent structure of tax evasion in developing countries is ample cause of revenue generation uncertainty (Roubini and Sala-i-Martin, 1992) and is acquainted to influence the economic growth adversely.

It is pertinent to mention that the uncertainty in revenue generation is overwhelmingly transmitting into the expenditures and budget uncertainty in Pakistan and leads to suppress the economic growth by large margin.

However, the financial development in the form of credit to private sector nullifies the adverse effects of uncertainty on economic growth. The credit to private sector and liquid liabilities enhances the real GDP by 0.27% and 0.03%, respectively. As discussed earlier, the financial resources intermediated in the economy modifies the investment decisions and leads towards increase in the tax net for revenue collection. Moreover, the tax evasion is a primary source of revenue collection uncertainty which reduces the efficiency of financial sector (Roubini and Sala-i-Martin, 1992). And in order to avoid the negative effect of uncertainty, the development of financial structure should be optimized. Government allows the financial markets, through financial repression, to control the inflation tax base originated through tax evasion and to increase the seigniorage taxation. Hence, inclusion of financial sector development has deliberating effect for reducing severity of uncertainty and makes headway for the economic growth.

The underlying error correction term (-0.15) shows that any shock to the series will make it close to the convergence point by 15% every year and implies the existence of long run stable relationship.

6. Conclusions and Policy Recommendations

The empirical link between macro-economic uncertainty and economic growth is manifested in the literature as the economic uncertainty is mostly accused by policy makers to erupt the stability and sustainability of economic development of the economies. Comparatively, the role of financial development is considered to be vital for the economic growth. In this regards, this study connotes the financial development with the moderating effects of fiscal policy uncertainty on economic growth in Pakistan over the time period 1970-2011. The uncertainty in macro-economic environment due to fiscal policy instability induces hazarding policy decisions which prove to be erroneous in the future time period.

By employing ARDL approach to Cointegration, this study indicates that uncertainty originated from budget deficit, government expenditures and revenue collection have significantly negative effect on economic growth and financial development helps to mitigate these adverse effects. Uncertainty in irrational government expenditures reduces economic growth and induces huge burden for optimum fiscal imbalances. The relevance of liquid liabilities that reduces uncertainty is delivered by secure investment portfolio in liquid assets with high equity returns. The significance of financial sector development in easing the resources for public budget found to collaborate in lessening the uncertainty's effects. Moreover, the pertinence of tax evasion, huge debt servicing and unnecessary government expenditures serves as fiscal policy failure and left severe consequences for the economy. The reconciling of financial sector interacts strongly in global macro-economic environment and mitigates the endangering effects of economic uncertainty by controlling the factors of risk behavior, degree of irreversibility and expandability of investment and development.

Particularly, the fiscal policy failure in generating revenues due to tax evasion and narrow tax base and its dependency on debt servicing to

meet its expenditures induces the vulnerable budget. In order to minimize the uncertainty in fiscal policy indicators following policy implications can be derived from the empirical findings of the study.

- The tax base should be broadened and the statement of assets should be mandatory by the taxpayer as a part of annual return to avoid tax evasion.
- The good governance is required in order to deal with the issues of transparency and accountability in the taxation system of Pakistan.
- The monetary policy should be monitored carefully keeping the autonomy of the central bank.
- There should be reinvestigation of budget in order to minimize the variations on quarterly basis.
- The expenditure curriculum reforms should be introduced in order to analyze the cost and benefit of government expenditures.

Regarding the stimulating role of financial development, following policy measures are suggested.

- Financial sector development in the form of optimal resource allocation and mobilization is required.
- The development of financial institutions should be focused in accordance to establish new private enterprises which will be registered tax payers increasing the tax net.
- The financial sector should also regulate the international capital flows and mobilize the monetary services to control the monetary shocks.

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The Macroeconomic Determinants of Outward Foreign Direct Investment: The Case of Kuwait

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This paper examines the home country macroeconomic determinants of Kuwait's outward foreign direct investment (OFDI) using country level time series data for Kuwait over the period (1976-2011). Also, a comparison is conducted between the trends of the factors determining OFDI in Kuwait, Saudi Arabia, and Norway as counterparts of developing and developed oil producing countries. The estimated models are examined using Johansen cointegration test, as well as error correction technique and Granger causality test. The study finds that the main macroeconomic determinants of Kuwait's OFDI are interest rate, inward foreign direct investment (IFDI), and public expenditure. The comparison shows that the trend of Kuwait's determinants of OFDI is partially consistent with the trend in Norway. Also, Granger causality tests show that OFDI in the three countries follows the hypothesis of IFDI-led OFDI.

Keywords: Outward FDI; Oil Producing Countries; Johansen Cointegration; Error Correction Model; Granger Causality

JEL Classification: E22, F21, O53

Introduction

The substantial increase in the amounts of foreign direct investment (FDI) among economies worldwide is an important aspect characterizing countries' economic positions and features. FDI is historically defined as the flow of country's investment through capital transfers, investment takeovers, or investment exploitation in foreign

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countries (Hymer, 1977). Moreover, according to the IMF's Fifth Edition Balance of Payment Manual (1993), direct investor is defined as an investor who owns at least 10% or more of ordinary shares within a foreign enterprise. The IMF declares enterprises with 10% or more of foreign ownership as FDI enterprises which include subsidiaries, associates, and branches. FDI is conducted by all types of investors such as public and private enterprises, group of individuals or enterprises, and governments or government agencies.

Some oil producing countries like Kuwait have a long-lasting history with FDI outflows. Kuwait's first attempt to transfer its capital to foreign countries was in the year 1953 through investing oil revenues abroad. Meanwhile, OFDI is dominating a large share of Kuwait's total investment (KIA, 2012). Kuwait's OFDI consist of long-term portfolio investment managed by Kuwait Investment Authority (KIA), investment by other government entities, and investment by Kuwait's private sector (Embassy of the United States-Kuwait, 2013). Large amount of assets is invested and managed by the Kuwaiti government abroad through KIA which is the world's oldest sovereign wealth fund. The KIA is a continuous shareholder and owner of numerous assets worldwide such as shares in real estate, foreign securities, and bonds (KIA, 2012). In this study, Kuwait forms the main pillar benchmarked with the other selected countries due to Kuwait's long lasting history with FDI outflows.

The motivation for conducting this study is the aspect drawn from the World Investment Report (2012) regarding the phenomenon of large exports of FDI from oil producing countries. Therefore, identifying the determinants of OFDI from oil producing countries is crucial to be investigated. Also, up to the researchers' knowledge, this study forms the first country level study conducted in the field of OFDI in Kuwait, which is the oldest foreign investor in a worldwide basis. The objective of this paper is to empirically study the macroeconomic determinants of OFDI in Kuwait and its counterparts of developing and developed oil producing countries such as Saudi Arabia and Norway, respectively. The study compares between the determinants of OFDI from Kuwait with Saudi Arabia and Norway due to their similar economic characteristics of heavy dependence on natural resources production and large exports of FDI.

The methodology used in the research is estimating country level models for the macroeconomic determinants of OFDI in Kuwait, Saudi Arabia, and Norway. The estimated models consisting of Johansen cointegration, error correction models (ECM), and Granger causality tests are used for time series data based on data availability in each country. Data used for Kuwait covers the period (1976-2011), Norway (1976-2011), and Saudi Arabia (1984-2012).

The empirical results show that the factors that have a significant impact on Kuwait's OFDI are interest rate, IFDI, and public expenditure which are partially consistent with the empirical results of Norway. In addition, the causality test estimates that Kuwait's OFDI follows the hypothesis of IFDI-led OFDI, and its domestic investment depends on its investments abroad.

This paper is organized as follows. Section two shows an overview on the previous studies. In section three, the environment of OFDI in Kuwait is explained. In section four, the methodology and model specification used in the study are explained. Data are provided in section five. The empirical results are explained in sections six. The conclusion and policy implications are provided in section seven.

Literature Review

The main determinants of FDI are classified into three major theories: international capital market theory, theory of the firm, and international trade theory which are mainly derived from Dunning's ownership, location, and internalization FDI framework. (Faeth, 2009; Vasyechoko 2012).

The FDI literature is rich in studies examining the determinants of FDI according to host countries' ownership and location advantages such as the studies of Buckley et al. (2007); Mohamed and Sidiropoulos (2010); Mughel and Akram (2011); Wadhwa and Reddy (2011); Al-Shammari and Al-Sarhan (2012); Akhtar, Khan, and Hussain (2013). Also, a number of studies investigate the determinants of FDI from firm level perspective like the studies of Setti et al. (2003); Ali and Guo (2005); Yu, Change, and Fan (2007).

Scholars study the macroeconomic determinants of OFDI from home country level perspective due to the limited empirical research conducted in this field, yet its significance in studying countries' motivation to invest abroad.

Wei and Alon (2010) study the home country macroeconomic determinants of China's OFDI using time series data for the period (1987-2006). The study applies PLS regression method to estimate the model. The study finds that China's imports and foreign reserves are associated positively with OFDI, whereas interest rate and exchange rate are associated negatively with OFDI. Also, Liu, Buck, and Shu (2005) study China's OFDI according to investment development path hypothesis over the period (1979-2002) using GMM methodology to take account of variables' endogeneity. The authors conclude that China's GDP per capita, investment in human capital, exports, and IFDI are all significant and have a positive impact on OFDI. Chowdhury (2011) investigates the determinants of OFDI in India using time series data for the period (1970-2009). The study applies unit root tests, cointegration, VECM, and Granger causality to test the model. The author concludes that human capital, exchange rate, domestic savings, and IFDI have a positive impact on India's OFDI. The study also shows that technology and interest rate have a negative impact on India's OFDI. Kyrkilis and Pantelidis (2003) investigate the home country macroeconomic determinants of OFDI from EU and non-EU members using time series data for the period (1977-1997). The authors find that countries' GNP, human capital, openness to trade, and technology is associated positively with OFDI. Saad, Noor and Nor (2011) study the home country macroeconomic determinants of OFDI in Malaysia applying time series data from 1980 to 2009. The authors find that Malaysia's export level, FDI inflows, and labor productivity are push factors of OFDI. The authors also find that Malaysia's GDP and oil consumption decrease the level of OFDI due to Malaysia's small market size and higher costs associated with low natural resource availability in the country. Studies find two way relationships between country's exchange rate and OFDI. Chen, Rau, and Lin (2006) show that exchange rate uncertainty has a negative relationship with country's OFDI. As mentioned earlier, Chowdhury (2011) finds a positive relationship between India's exchange rate and OFDI in India due to higher competitiveness measured in depreciation of exchange rate. On the other

hand, Wei and Alon (2010) find a negative relationship between China's exchange rate and OFDI. Similarly, Apergis, Asteriou, and Papathoma (2012) find a negative relationship between exchange rate and OFDI for Greece at sixteen EU and non-EU countries.

According to Saad, Noor, and Nor (2011) the low level of natural resources is associated with higher cost of production and higher OFDI. On the other hand, Nachum, Dunning, and Jones (2002) examine the effect of natural resource abundance and OFDI through studying OFDI and comparative advantage in the United Kingdom.

The study states that due to the ownership advantage obtained from natural resource availability, a comparative advantage is gained to the extent of the resource availability in the country which could affect OFDI negatively. However, the study finds that more mature MNE exploit other resources available in other countries which they are comparatively disadvantageous to maintain their international competitiveness. Thus, natural resource availability can have positive or negative relationship with OFDI depending on the MNE's level of maturity.

Since this paper examines OFDI from countries with large shares of government controlled MNE, public expenditure is used to indicate government control on the economy. If the country increases its government spending, the budget surplus decreases causing less capital transfers abroad, and vice versa. According to Saif (2009), Kuwait, which is the pillar of the study, experienced an expansionary fiscal policy throughout the period (1970s-1990s). Therefore, the expected relationship between Kuwait's public expenditures and OFDI is negative because the increase in the country's government expenditure lowers the amounts of capital transfers abroad.

The Environment of FDI in Kuwait

Compared to the other countries in the region, Kuwait appears to be one of the least attractive destinations for FDI inflows. Even though the GCC is mainly perceived as a region with low FDI inflows in comparison to other regions around the world in general and among the developing regions in specific, Kuwait constitutes only 0.8% from total

FDI inflows towards the GCC region during the period (2005-2011). The indigent rate of FDI inflows in Kuwait appears to be due to the “Kuwaitization” strategy adopted by Kuwait which supports the national ownership of firms and encourages the presence of national employment in all economic activities. Although Kuwait established the entity Kuwait Foreign Investment Bureau and an accompanying law in the year 2001 to encourage FDI inflows, they neither accelerated the procedures of business establishment in Kuwait nor assisted foreign firms in gaining approval to invest in Kuwait (Embassy of the United States-Kuwait, 2013). The GCC largest destinations for FDI inflows are Saudi Arabia and United Arab Emirates with 58.2% and 24%, respectively for the period (2005-2011) (World Investment Report, 2012).

On the other hand, Kuwait is one of the leading countries in OFDI and capital transfers to foreign countries. Kuwait’s first attempt of OFDI was in the year 1953 though investing oil revenues abroad. According to World Investment Report (2012), Kuwait is a significant player in FDI outflows among developing countries. Kuwait’s OFDI is continuously increasing among the years since 2005, except a decrease during 2009 and 2010, due to the world financial crisis. Kuwait constitutes approximately 2.7% of total FDI outflows from total OFDI from developing countries during the period (2005-2011), which is considered large compared to the number of developing countries and the size of the Kuwaiti economy relative to the other economies. It also constitutes large shares of FDI outflows from the MENA region with 28.5% and from the GCC with 35.6% of total FDI outflows during the period (2005-2011). It is no surprise that Kuwait is one of the largest exporters of foreign investment on a worldwide basis. As mentioned earlier, Kuwait owns the world’s oldest sovereign wealth fund, and it transfers capital across borders though investing oil revenues in foreign countries (KIA, 2012). KIA is established by Kuwait government in 1953 as an authorized body responsible for managing Kuwait’s investment in foreign countries. KIA manages Kuwait’s funds abroad which are composed of: General Reserve Fund (GRF) and Future Generations Fund (FGF). The GRF includes Kuwait’s oil revenues and income earned from investing these revenues abroad. The FGF was established in 1976 to preserve the shares of Kuwait’s future generations from Kuwait’s oil revenues. Ten percent of Kuwait’s revenues are placed in

FGF, as well as, 25% of the net income generated from GRF. KIA allocates investment in foreign countries based on countries' macroeconomic factors such as market size, growth, and income (KIA, 2012).

Methodology and Model Specification

The methodology used to conduct the study is estimating country level models for home country macroeconomic determinants of OFDI in Kuwait, Saudi Arabia, and Norway. The econometric models are estimated using time series data based on data availability in each country. The study uses a number of econometric techniques which are unit root tests, cointegration tests, error correction models, and Granger causality tests. The study's models are based on the theoretical framework adopted from the literatures of the macroeconomic determinants of OFDI. The original variables used to construct the model for studying the home country macroeconomic determinants of OFDI in Kuwait from country level perspective are adopted from several studies such as Wei & Alon (2010); Buckely et al. (2007); Chowdhury (2011) models for studying OFDI determinants in China and India.

The study's empirical model in its natural logarithm linear form is:

$$\text{Log(OFDI)}_t = \beta_1(r)_t + \beta_2(EX)_t + \beta_3(FE)_t + \beta_4(OPENNESS)_t + \beta_5(IFDI)_t + \beta_6 \text{Log(PR)}_t + \beta_7 \text{Log(PE)}_t + \varepsilon_t$$

Where "OFDI" is the value of OFDI flows; "r" is lending interest rate; "EX" is the exchange rate against US dollar; "FE" is the factor endowment measures by the ratio of oil exports to total exports; "OPENNESS" is openness to trade calculated by the sum of total exports and imports to GDP; "IFDI" is the value of IFDI flows; "PR" is public revenue; "PE" is public expenditure; "ε" is the error term; and "t" is time.

The independent variables public revenue (proxy of income), interest rate, exchange rate, and IFDI are obtained from Chowdhury (2011) for studying the macroeconomic determinants of OFDI in India. The variable openness to trade is adopted from Wei and Alon (2010) for

studying the macroeconomic determinants of Chinese OFDI. The measure of the variable natural resource endowment is adopted from Buckley et al. (2007) for studying the determinants of China's OFDI. The variable public expenditure is included in the model to envisage the role of government policies on FDI outflows.

Data Description

With regards to Kuwait's data, data for OFDI flows, exchange rate, public revenue, public expenditure, and IFDI flows are obtained from the quarterly statistical bulletin (special edition) published by the Central Bank of Kuwait. Data for Kuwait's interest rate are obtained from World Bank database. Data for Kuwait factor endowment and openness to trade are collected from the Annual Statistical Abstract (various years) published by Kuwait's Ministry of Planning. All the variables are expressed in Kuwaiti dinar. The variables included in Kuwait's model are also applied to Saudi Arabia and Norway. Data for public revenue, public expenditure, exchange rate, and interest rate for Saudi Arabia are collected from the Saudi Arabian Monetary Agency (SAMA) statistical publications. Data for OFDI, IFDI, and trade openness are collected from (UNCTAD) database published by the United Nations. Data for Saudi Arabia's oil exports used for calculating factor endowment is obtained from OPEC annual statistical bulletin. All variables in Saudi Arabia's model are expressed in US dollar. With regards to Norway model, Data for OFDI and IFDI are collected from (UNCTAD) database. Data for trade openness, interest rate, exchange rate, public expenditure, and public revenue are obtained from (OECD) statistical database. However, oil production is used in the model which is obtained from OPEC Annual Statistical Bulletin due to the unavailability of data for Norway's oil exports needed to calculate factor endowment. All variables in Norway's model are expressed in US dollars.

Empirical Results

Table 1 shows the results of Augmented Dickey-Fuller (ADF) unit root test for the models of Kuwait, Saudi Arabia, and Norway. According to the test's results (with drift only) and (with drift and trend), all the variables in the models appear to be stationary at their differences but

with different levels of statistical significance. Also, Table 2 shows the results of Phillips-Perron unit root test for the models, and similar to the results of ADF test, variables are all stationary at their differences and with different levels of statistical significance. Therefore, the three models appear to be statistically free from unit root that causes disturbances in the models estimation and spurious models (Dickey and Fuller, 1979; Phillips and Perron, 1988).

Table 1: ADF Unit Root Test- Drift Only/ Drift and Trend (Kuwait, Saudi Arabia, and Norway)

(ADF)- With Drift Only					(ADF)-With Drift & Trend				
Country	Variables	ADF-Stat. (Level)	Lags	ADF-Stat. (Diff.)	Lags	ADF-Stat. (Level)	Lags	ADF-Stat. (Diff.)	Lags
Kuwait	EX	-2.041**	[1]	-3.548***	[2]	-1.859	[1]	-3.882**	[2]
	(r)	-3.702***	[1]	-4.015***	[2]	-4.274**	[1]	-4.350***	[2]
	OFDI	-1.244	[1]	-3.278***	[2]	-1.891	[1]	-3.289*	[2]
	Log PE	-1.149	[1]	-3.420***	[2]	-2.156	[1]	-3.359*	[2]
	IFDI	-2.295**	[1]	-5.339***	[2]	-3.152	[1]	-5.882***	[2]
	Log PR	-1.140	[1]	-4.616***	[2]	-2.102	[1]	-4.940***	[2]
	OPENNESS	-2.904***	[1]	-3.293***	[2]	-3.236*	[1]	-3.238*	[2]
	FE	-4.194***	[1]	-5.047***	[2]	-4.890***	[1]	-4.961***	[2]
Saudi Arabia	EX	-10.917***	[0]	-***	[0]	-9.455***	[0]	-***	[2]
	(r)	-1.911**	[1]	-3.811***	[2]	-4.592*	[1]	-3.625**	[2]
	OFDI	-0.102	[1]	-4.964***	[2]	-1.067	[1]	-4.873***	[2]
	Log PE	-0.794	[1]	-4.749***	[2]	-2.372	[1]	-4.645***	[2]
	IFDI	-2.013**	[1]	-3.219***	[2]	-2.565	[1]	-3.260*	[2]
	Log PR	-0.289	[1]	-4.412***	[2]	-2.771	[1]	-4.307**	[2]
	OPENNESS	-1.567*	[1]	-4.953***	[2]	-2.118	[1]	-4.939***	[2]
	FE	-2.588***	[1]	-3.851***	[2]	-2.603	[1]	-3.582*	[2]
Norway	EX	-2.847***	[3]	-3.405***	[4]	-2.348	[3]	-3.321*	[4]
	(r)	-0.032	[3]	-5.565***	[4]	-2.658	[3]	-5.448***	[4]
	OFDI	0.391	[3]	-3.433***	[4]	-0.937	[3]	-3.329*	[4]
	Log PE	-1.384*	[3]	-3.984***	[4]	-1.636	[3]	-3.942**	[4]
	IFDI	-0.474	[3]	-3.314***	[4]	-2.269	[3]	-3.566*	[4]
	Log PR	-2.345**	[3]	-4.517***	[4]	-2.505	[3]	-4.420***	[4]
	OPENNESS	-2.811***	[3]	-3.361***	[4]	-2.546	[3]	-3.282*	[4]
	FE	-2.141**	[3]	-3.127***	[4]	0.026	[3]	-3.140*	[4]

***1% significance ** 5% significance *10% significance. ADF (in difference) are expressed as first difference of the variable for Kuwait, and second difference of the variables for Saudi Arabia and Norway. Number of lags is chosen based on Akaike Information Criterion. For Saudi Arabia's Model, ADF with difference for the variable EX is excluded corresponding to the variable's data.

Table 2: P.P Unit Root Test-With Trend (Kuwait, Saudi Arabia, and Norway)

Phillips-Perron (with Trend)					
Country	Variables	P.P t-stat. (level)	Lag	P.P t-stat. (diff.)	Lag
Kuwait	EX	-1.924	[3]	-5.585 ***	[3]
	(r)	-2.677	[3]	-4.450 ***	[3]
	OFDI	-2.638	[3]	-7.695 ***	[3]
	Log PE	-2.756	[3]	-7.388 ***	[3]
	IFDI	-5.332 ***	[3]	-14.846 ***	[3]
	Log PR	-2.249	[3]	-7.279 ***	[3]
	OPENNESS	-2.872	[3]	-5.346 ***	[3]
	FE	-4.435 ***	[3]	-7.595 ***	[3]
Saudi Arabia	EX	-10.917 ***	[0]	- ***	[0]
	(r)	-1.911 **	[1]	-3.811 ***	[2]
	OFDI	-0.102	[1]	-4.964 ***	[2]
	Log PE	-0.794	[1]	-4.749 ***	[2]
	IFDI	-2.013 **	[1]	-3.219 ***	[2]
	Log PR	-0.289	[1]	-4.412 ***	[2]
	OPENNESS	-1.567 *	[1]	-4.953 ***	[2]
	FE	-2.588 ***	[1]	-3.851 ***	[2]
Norway	EX	-1.691	[3]	-8.047 ***	[3]
	(r)	-2.445	[3]	-10.627 ***	[3]
	OFDI	-1.740	[3]	-11.870 ***	[3]
	Log PE	-2.034	[3]	-9.161 ***	[3]
	IFDI	-3.504 **	[3]	-4.581 ***	[3]
	Log PR	-2.602	[3]	-12.987 ***	[3]
	OPENNESS	-2.226	[3]	-9.613 ***	[3]
	FE	-0.689	[3]	-14.150 ***	[3]

*** 1% significance ** 5% significance * 10% significance. P.P (diff.) are expressed as first difference for Kuwait and as second difference for Saudi Arabia and Norway. Numbers of lags are chosen based on Newey-West selection criterion

Since ADF and P.P unit root tests show that all variables in the three models are stationary at their first or second differences, the cointegration test is performed in order to investigate the existence of a long-run relationship among the variables in the models (Johansen, 1988). Table 3 shows the results of Johansen cointegration tests for the models of Kuwait, Saudi Arabia, and Norway. Johansen cointegration test shows that all the variables in the models are cointegrated at 5% significance. Therefore, all the variables in the models show a statistically significant long-run relationship between each independent variable and FDI outflows. Hence, it is feasible to study the short-run relationship between the variables and FDI outflows, as well as, the models' equilibrium.

Table 3: Johansen Cointegration Tests (Kuwait, Saudi Arabia, Norway)

Country	Hypothesis	Eigenvalue	Statistic	0.05 Critical Value	Prob.
Kuwait	Trace Statistic Test				
	$r \geq 1$	0.7528	146.86	117.70	0.00
	$r = 2$	0.6362	99.34	88.80	0.01
	$r = 3$	0.559	64.94	63.87	0.04
	Maximum Eigenvalue Test				
	$r \geq 1$	0.7528	47.52	44.49	0.02
	$r = 2$	0.6362	34.38	38.33	0.13
	$r = 3$	0.559	27.68	32.12	0.15
Saudi Arabia	Trace Statistic Test				
	$r \geq 1$	0.7913	93.64	83.94	0.01
	$r = 2$	0.5411	51.33	60.06	0.22
	$r = 3$	0.4657	30.29	40.17	0.34
	Maximum Eigenvalue Test				
	$r \geq 1$	0.7913	42.32	36.63	0.01
	$r = 2$	0.5411	21.03	30.44	0.45
Norway	Trace Statistic Test				
	$r \geq 1$	0.7838	161.34	117.71	0.00
	$r = 2$	0.6981	109.26	88.80	0.001
	$r = 3$	0.5686	68.54	63.88	0.019
	Maximum Eigenvalue Test				
	$r \geq 1$	0.7838	52.09	44.49	0.01
	$r = 2$	0.6981	40.72	38.33	0.03
	$r = 3$	0.5686	28.59	32.12	0.13

The error correction model is applied after estimating the existence of long-run relationship among the variables in the models. The ECM estimations detect the variables' short-run effects on the model and the speed of adjustments of the dependent variables toward equilibrium after a shock. Since the general form of the error correction model is based on a single equation, the ECM single equation model is applied on each independent variable in the model individually.

Table 4 illustrates the estimations of the error correction models for each variable in the models. For Kuwait's model, it shows that the variables (r), Log PE and IFDI are individually statistically significant at 5%, 10%, and 1%, respectively. The variables (r) and Log PE have negative effects on the changes in OFDI which are consistent with the economic theory and expected sign. The negative relationship between interest rate

and OFDI emphasizes the theory of interest rate to be associated with higher saving rate which has a negative impact on FDI outflows.

Also, the negative relationship between public expenditure and OFDI shows that the higher the domestic spending, the lower the FDI outflows. Since Log PE is 10% significant in the model, Kuwait's public expenditure is expected to have a minor effect on OFDI. This can be explained as the majority of Kuwait's public expenditures are current expenditures (such as spending on subsidies and wages) rather than capital expenditure. With regards to the variable IFDI, it shows an opposite sign from economic theory because it shows that the short-run changes in IFDI affect the changes in OFDI negatively. The negative relationship between Kuwait's IFDI and OFDI occurs as a result of the low levels of IFDI in Kuwait and lack of attraction of foreign investment which generate low ownership advantage that increases OFDI. The error correction coefficients in all the estimated ECM models are in the expected hypothetical negative sign, within the interval $-1 < \beta_1 < 0$, and statistically significant indicating that the model is in equilibrium.

For Saudi Arabia, Table 4 shows the error correction estimation which indicates that the variable IFDI is the only individually statistically significant variable in the model at 5% significance, and its sign is consistent with the economic theory. This result emphasizes that the inflows of capital, human capital, and know-how to the country contributes in increasing the ownership advantage and efficiency of domestic investment and hence increasing OFDI. However, all the other variables in the model appear to be individually statistically insignificant. Even though the error correction coefficients are all significant and match the expected negative sign, the corrections overshoot the long run equilibrium because ECM values are not within the interval $-1 < \beta_1 < 0$. Therefore, Saudi Arabia's model is expected to have spurious relationship among its variables.

As for Norway, the error correction models estimated in Table 4 show that the variables (r), IFDI, Log PR, and Log PE are individually statistically significant at 5%, 1%, 5%, and 10%, respectively. All coefficients estimated at Norway's model match the expected sign and economic theory. The negative relationship between Norway's interest rate and OFDI represents the phenomenon of high interest rate

indicating higher profitability from saving and higher costs of capital which discourages investing. Also, the estimation shows a positive relationship between IFDI and OFDI which matches the theory of ownership advantage and inter-linked relationship between country's inwards and outward FDI flows. Similar to Kuwait's model, public expenditure in Norway has a negative relationship with OFDI indicating that higher government spending lowers the surplus available for outward investment and it doesn't have a highly robust statistical significance. For the variable Log PR, the ECM estimation shows a positive relationship between government revenues and FDI outflows which is consistent with the theory of higher income of revenues to be associated with higher OFDI opportunities. Table 4 also shows that the error correction coefficients are all significant and negative, but not within the interval $-1 < \beta_1 < 0$ indicating that the error corrections overshoot the long run equilibrium.

Table 4: Error Correction Models (Kuwait, Saudi Arabia, and Norway)

Country	Variables	Constant	Coefficient	t-statistic	Error Correction	Error Correction t-statistic
Kuwait	ΔEX	-53.95	11132.45	0.98	-0.565	-1.99 *
	$\Delta (r)$	-79.45	-4836.75	-2.55 **	-0.558	-2.19 **
	$\Delta \text{Log PE}$	12.40	-1973.41	-1.97 *	-0.484	-1.85 *
	ΔIFDI	-47.72	-1.24238	-2.88 ***	-0.481	-1.94 *
	$\Delta \text{Log PR}$	-49.51	-539.0557	-1.04	-0.567	-2.00 *
	$\Delta \text{OPENNESS}$	-62.41	33.35064	0.04	-0.491	-1.76 *
	ΔFE	-60.03	-4725.73	-0.61	-0.555	-1.88 *
Saudi Arabia	ΔEX	-91.45	-16750.97	-0.15	-1.826	-5.99 ***
	$\Delta (r)$	-86.87	2053.971	1.05	-1.686	-5.19 ***
	$\Delta \text{Log PE}$	-82.59	-580.0270	-0.33	-1.798	-5.73 ***
	ΔIFDI	-72.13	0.1154936	2.40 **	-1.603	-5.55 ***
	$\Delta \text{Log PR}$	-86.86	1530.683	1.39	-1.714	-5.65 ***
	$\Delta \text{OPENNESS}$	-93.25	3860.675	0.68	-1.779	-5.77 ***
	ΔFE	-89.83	1019.213	0.20	-1.827	-5.99 ***
Norway	ΔEX	-332.15	521.0606	0.02	-1.77	-5.63 ***
	$\Delta (r)$	-373.31	-16943.83	2.38 **	-1.88	-6.50 ***
	$\Delta \text{Log PE}$	-360.06	-64122.83	-1.86 *	-1.85	-6.22 ***
	ΔIFDI	-0.3536	0.9009604	4.44 ***	-2.11	-8.29 ***
	$\Delta \text{Log PR}$	-363.16	127150.9	2.20 **	-1.92	-6.47 ***
	$\Delta \text{OPENNESS}$	-339.65	4872.002	0.28	-1.79	-5.62 ***
	$\Delta \text{Log OP}$	-338.57	10953.19	0.51	-1.76	-5.71 ***

***significant at 1% ** significant at 5% * significant at 10%

In addition to the ECM that estimates the short-run relationship between each independent variable in the model and OFDI, Granger causality test is estimated to examine the direction of causality among the dependent variable and the independent variables, if a relationship exist among them. Table 5 shows the Granger causality estimation for the models of Kuwait, Saudi Arabia, and Norway. For Kuwait's model, Table 5 shows a Granger causality relationship between IFDI and OFDI. However, the relationship between IFDI and OFDI in Kuwait is not consistent with the economic theory based on ECM estimations. The cause of this issue is the low level of FDI inflows in Kuwait throughout the years in comparison to the level of Kuwait's FDI outflows. Even though the relationship between IFDI and OFDI is negative, Kuwait's history shows the initial causality relationship between them because the initial stages of Kuwait's economic growth was created by foreign capital inflows in a form of labor and capital to invest in oil extraction and to operate in different sectors in Kuwait. Granger causality test also shows that OFDI Granger causes interest rate. This relationship illustrates that interest rate or cost of capital is affected by the degree of investment abroad. Therefore, the amount of Kuwait's investment abroad causes the amount of Kuwait's domestic investment because domestic investment is determined by the cost of capital in the country.

For Saudi Arabia, since the variable IFDI is the only statistically significant variable in the model based on the ECM estimations, the indication of the bilateral causality relationship between IFDI and OFDI is considered valid. The direction and the sign of the relationship between Saudi Arabia's OFDI and IFDI are consistent with the economic theory and with the ECM estimations. The bilateral causality relationship between IFDI and OFDI is accurate because the capital inflows among countries provide it with necessary ownership advantages which in turn strengthen its economic performance, and enables it to invest abroad and utilize the advantages of FDI instead of trade. Therefore, the Granger causality relationship indicates that Saudi Arabia's OFDI supports the hypothesis of IFDI-led OFDI, and its IFDI supports the hypothesis of OFDI- led IFDI.

With regards to Norway, Table 5 shows that there is Granger causality relationship between Norway's IFDI and OFDI. This result is also consistent with the hypothetical sign of the economic theory and the

ECM estimations. As stated earlier, the country's attraction of foreign capital inflows increases its capital outflows towards foreign countries. Thus, the Granger causality relationship between Norway's IFDI and OFDI also indicates that Norway's OFDI supports the hypothesis of IFDI-led OFDI.

Table 5: Granger Causality Tests (Kuwait, Saudi Arabia, and Norway)

Null Hypothesis	Kuwait		Saudi Arabia		Norway	
	Granger Causality Statistic	Result	Granger Causality Statistic	Result	Granger Causality Statistic	Result
OFDI does not Granger cause (r)	6.32	reject	0.95	Cannot reject	2.98	Cannot reject
OFDI does not Granger cause EX	0.77	Cannot reject	0.06	Cannot reject	1.54	Cannot reject
OFDI does not Granger cause FE	2.23	Cannot reject	1.40	Cannot reject	1.85	Cannot reject
OFDI does not Granger cause IFDI	2.63	Cannot reject	8.83	reject	1.96	Cannot reject
OFDI does not Granger cause OPENNESS	1.49	Cannot reject	2.89	Cannot reject	2.35	Cannot reject
OFDI does not Granger cause PE	1.58	Cannot reject	3.42	Cannot reject	0.79	Cannot reject
OFDI does not Granger cause PR	2.41	Cannot reject	3.37	Cannot reject	1.27	Cannot reject
(r) does not Granger cause OFDI	2.84	Cannot reject	7.15	reject	0.99	Cannot reject
EX does not Granger cause OFDI	1.06	Cannot reject	0.06	Cannot reject	1.78	Cannot reject
FE does not Granger cause OFDI	1.71	Cannot reject	0.26	Cannot reject	2.10	Cannot reject
IFDI does not Granger cause OFDI	8.19	reject	3.87	reject	9.47	reject
OPENNESS does not Granger cause OFDI	3.34	Cannot reject	2.75	Cannot reject	2.01	Cannot reject
PE does not Granger cause OFDI	1.29	Cannot reject	2.49	Cannot reject	0.17	Cannot reject
PR does not Granger cause OFDI	2.57	Cannot reject	2.69	Cannot reject	0.19	Cannot reject

Number of lags is chosen based on Akaike Information Criterion

Comparison between Trends of OFDI from Kuwait, Saudi Arabia, and Norway

After implementing the empirical analysis for the home country macroeconomic determinants of OFDI in Kuwait, Saudi Arabia, and Norway, a comparison between the significant variables in Kuwait's model are compared with the trends in their counterparts in Saudi Arabia and Norway. The trend of Kuwait's public expenditure with respect to OFDI matches the trends in Saudi Arabia and Norway. This result emphasizes the theory that the increase in the country's government expenditure minimizes the opportunity for investing abroad, particularly investment from state owned enterprises. However, the trend of Kuwait's interest rate with respect to OFDI matches the trend in Norway only. Kuwait and Norway shows the sign suggested by economic theory that the increase in domestic interest rate or savings is associated with a decrease in FDI outflows. On the other hand, the trend of the variable IFDI in Kuwait neither matches the economic theory nor the trend in Saudi Arabia and Norway.

Moreover, the Granger causality results show that the three models indicate a common causality relationship between the country's IFDI and OFDI emphasising that the country's investment abroad are led by its attraction of foreign investment. However, the relationship between Kuwait's OFDI and IFDI opposes the theoretical sign during the period under study. Moreover, Granger causality results for Saudi Arabia indicate that the country's OFDI is led by its IFDI. In addition, Kuwait's domestic investment or savings depend on its investment abroad; according to the empirical results obtained for Saudi Arabia and Norway, this outcome is not a feature of both cases.

Conclusion and Policy Recommendations

This paper empirically examines the home country macroeconomic determinants of OFDI from Kuwait, Saudi Arabia, and Norway as counterparts of developing and developed oil exporting economies. As Kuwait is referenced to be the oldest practitioner of abroad investment through establishing the sovereign wealth fund in early 1950s and being the main player of OFDI in the region, Kuwait is the pillar of this study. The empirical results show that the factors that have a significant impact on Kuwait's OFDI are interest rate, IFDI, and public expenditure. The

negative relationship between OFDI with interest rate and public expenditure indicates that the higher the domestic saving rate and the higher the government expenditure deters the country's FDI outflows. Although the estimated relationship between Kuwait's IFDI and OFDI is negative, the roots of Kuwait's gain of capacity to invest abroad were obtained from resource seeking foreign countries investing in Kuwait which enables it to invest abroad. In addition, the causality test estimates that Kuwait's OFDI follows the hypothesis of IFDI-led OFDI, and its domestic investment depends on its investment abroad. This result forms a critical phenomenon affecting Kuwait's overall economic performance. If the country's FDI outflows are controlling saving rate and hence domestic investment, the objective of FDI which is facilitating the country's investment and contributing to its economic growth is not achieved.

The comparison among the trends of Kuwait's home country macroeconomic determinants of OFDI with Saudi Arabia and Norway shows that Kuwait seem to have a partial symmetry with OFDI trends in Norway in terms of interest rate and public expenditure. However, the trend of IFDI in Kuwait does not match the trends of both Saudi Arabia and Norway due to the indigent amount of FDI attracted by Kuwait during the past years. Nevertheless, IFDI forms the base of Kuwait's OFDI due to its role in strengthening Kuwait's ownership advantages at the initial stage of investments and economic growth.

Based on the results obtained from this study, further research can be conducted in the field of home country macroeconomic determinants of OFDI for natural resource abundant countries by including a larger sample of countries, longer period of time, or different econometric techniques. Also, another idea to be considered for further research is choices of FDI locations from government owned MNEs by including a larger sample of countries or using firm level data from MNEs owned by SOE.

Several policies are proposed to maximize the returns and efficiency of Kuwait's OFDI and to improve the role of IFDI in Kuwait.

- Since the study shows that Kuwait's fiscal policy have an effect on OFDI, increasing Kuwait's capital spending could positively

affect OFDI and IFDI in the long-run. That can be because capital spending creates investment opportunities which increases the surplus and consequently OFDI, and it attracts foreign investment.

- Kuwait's OFDI should take part in a variety of economic activities in order to have a diversified investment basket. For instance, investing in activities like manufacturing and commodity producing provides Kuwait with a certain degree of ownership advantage that is not maintained locally. Also, investing in a variety of economic activities reduces investment risks.

Kuwait should efficiently manage its domestic and outward investment to have efficient economic growth policy and diversified income because the empirical findings suggest an impact of OFDI on cost of capital. This can be done through utilizing revenues to generate value added investment and attract more foreign investment in Kuwait.

- Since Kuwait's IFDI is not effectively supporting its OFDI, streamlining "doing business" procedures, and changing the rules and regulations that govern IFDI regarding foreign ownership, investment licenses, and investment lands is necessary in creating an attractive investment environment for strategic investors and leading to effective IFDI which could increase OFDI.
- Since the development plan implemented by Kuwait requires the usage of revenues and specialization of expenditures to execute mega projects in Kuwait, OFDI will be highly affected by these projects in the short and long runs. As a consequence of the reformation of Kuwait's economy in terms of infrastructure and execution of mega projects, FDI inflows can be attracted which can also increase the opportunity of OFDI.

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Factors Influencing Youth's Decision in Entering Formal and Informal Labour Markets in Egypt

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This paper attempts to uncover the factors influencing youth's choices into labour market in Egypt. Using the ILO's School-to-work transition survey (Egypt, 2014) as the main source of data, the paper is trying to formulate a clear idea about the socio-economic and demographic background characteristics of both formal and informal sector workers. Using "Discriminant Function Analysis", the results confirm to the hypothesis that formal workers are different from those who join the informal labor markets. Informal sector workers are likely to be more male-dominant, younger, mostly reside in rural areas, poorly educated, have no-formal education or training experiences, have more children, comes from a financially poor families, and educationally less advantages parents. Education, place of residence, age at first marriage, parents' level of education, and principal work status made the greatest contribution in differentiating between the two groups and can be considered as the most predictor variables of the informal workers.

1. Introduction

Informality has been a challenge for Egypt for some decade. Data on the pattern of new entrants to the Egyptian labour markets from 1969 till 1998 show that new entrants to the labour markets were disproportionately drawn into informal sector (El-Bakly, 2001). The study shows that in 1969, around 75% of new workers were drawn into formal public employment and 20% into informal jobs.² Since 1993, informal sector has been providing more employment than formal public employment. Thus, by 1998 about 70% of new workers were drawn into

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² Informality in the mentioned study measured by whether job contract is existent or not.

informal sector employment and only about 20% into formal public jobs. The relative share of formal private employment has doubled; however remain modest.

Recent data suggests that the informal employment accounts for about 40% in 2012 and growing at faster pace than the formal employment (El-Sayed, 2014). Moreover, data from Egypt "School-to-Work Transition Survey, 2014" suggested that this pattern remains.

Since 1970's economic policies that have been implemented in Egypt have neither stimulated the growth of the industrial sector nor have encouraged the private sector investment. Informal sector had been growing at about 2.8% per annum between 1976 and 1986 (Handoussa, 1991). This rate of growth increased to 3.6% per annum between 1980 and 1985 (Rizk, 1991). With this rate of growth, informal sector employment accounted for about 24 and 26% of the total active labour force in 1976 and 1986 respectively (Al-Mahdy, 1996). When agriculture activities are excluded, the informal sector would contain about 45% and 40% of the total employment in 1976 and 1986 respectively. Moreover, in the non-agriculture private sector, informal sector would account for about 93% and 90% of the total labour force in 1976 and 1986 respectively (Handoussa, 1992).

During the 1990's, the share of informal sector employment³ outside agriculture, increased from about 40% in 1990 to 46.3% in 1998 according to Egypt Labor Market Survey of 1998, and would have been increased to 56.12% if all workers were considered. Therefore, the majority of jobs created in the 1988-1998 decade were among the informal sector. Informal sector employment share would account for more than 82% of the employment growth of private non-agricultural wage employment between 1988 and 1998. Moreover, informal sector employment grew at 7% per annum during 1988-98, while the corresponding rate for the formal private employment was 4.8% during the same period.

Moreover, 75% of new entrants who entered the labor market during 2000-2005 were entering into informal work, resulting in the share of informal workers escalated to 61% of all employment in 2006 (Assaad,

³ Informal sector employment includes those who have neither contract nor social security.

2007). This trend continued, as another nationally representative data set, specifically the Egyptian Labor Market Survey (ELMS) of 2012, shows that among the 66.7% of young men who had a paid job, about 52% of them joined the informal sector, however, women's situation was different with lower share entering the informal sector (Amer, 2014). Data from Egypt "school-to-work transition survey" 2014 dataset suggests that this pattern remains (El-Bakly, 2016), which supports the argument that the era of the government being the major employer is gone as the role of the government shifted to be a regulator and facilitator for job creation and for the protection of workers' rights (Barsoum, 2014, Nazier, Hanan and Ramadan, 2014).

Accordingly, relying on any definition of informality, the data show that informality became a feature of Egypt labour market. The negative impacts of informality are not restricted to the individuals, households or institutions that are working in the informal sector but on the economy of Egypt as a whole (For details on the negative impacts of informality see Kassem, 2014). Hence, attempts to integrate informal sector into formal one became crucial approach to rescue Egypt's economy and get it out of the unforeseen future. To do that, the main target could be eliminating freedom to choose between joining the formal and informal sectors or encourage people to join the formal sector. However, such approach requires enough information on the type of factors influencing people's choice to join informal sector, which is the main focus of the current paper.

2. Significance of Study

Any approach which recommends mandatory legislative, executive and judicial reforms aiming at depriving individual from joining the informal sector will not be fully effective unless considering the socio-economic background of those who joined or intend to join the informal rather than the formal sector. Also, any attempt to integrate informal into formal sector on the individual or firm basis will go vain without knowing the main factors that play the major roles in determining people's choices in entering the labour market.

Moreover, with respect to policy making, one should keep in mind that any mandatory legislative, executive and judicial reforms should be accompanied with a socio-economic policies aiming at providing

individuals, for example, with the proper education and skills to meet the principal requirements, if any, to join the formal sector.

The results of the current research can be of great importance in labor policy making in Egypt and other developing countries as well, in most of these countries, informal sector labor represents about half of their total labour. The increase in the number of informal employment makes it more urgent to develop specific policies with aim not only to improve the well-being of millions of these workers and create better jobs for all but also to try stimulating informal labor to join the formal sector. Informal work prevalent in low- and middle-income countries; and it is important in some high-income economies as well. In many cases, the share of job practice outside official institutions of a country may represent more than half of non-farm employment, or up to 90% if agricultural employment is included. World wide data show that the informal labor represents 60% of the total work. Also, the largest proportion of the non-farm informal labor are in Africa - Sub-Saharan by up to 80%, followed by South and Southeast Asian countries about by about 70%, and Latin America by 52% (OCDE, 2009).

3. Methodology

Any examination of the factors that influence people's choices in entering labour markets is conceptually difficult. The problem of causal inference is particularly complex, since an independent effect on joining the labour markets cannot always be identified. Workers who join the informal labour markets might be different in many ways from those who join the formal labour markets (see for example El-Bakly, (2001), El-Bakly, (2003), Labour and Social Affairs Commission of the African Union (2009)).

To examine the above hypothesis, it is appropriate to have an overview and to formulate a clear idea about the socio-economic and demographic background characteristics of both formal and informal sector workers. Particular attention should be directed to certain characteristics that are considered as the potential micro determinants operating on people to join the informal labor market.

As comparing between formal and informal sector workers, a question must be raised whether any revealed difference between the two groups

(in terms of percentage distribution) is sufficient evidence for differentiating between them or whether the difference could have arisen by chance. This can be done by using what is called a “Chi-squared Test”. The classification of the two sector groups based on some criteria that used to identify the informal sector workers from the overall formal sector workers.

Also in differentiating between two or more groups with respect to several variables, a question must be raised about the rules that should be adopted so as to make as few mistakes as possible over a large number of similar situations. Questions of this type give rise to what is called “Discriminant Function Analysis”, the general objective of which is to find rules of behavior in the assignment of individuals to predetermined classes with optimal properties.

However, it could be appropriate first to justify why “Discriminant Function Analysis” is used. In the strict statistical sense, several statistical methods can be used to differentiate between different groups of things or persons. These are called “Multivariate Analysis”, which means the study of how several variables vary together.

Analysis of Covariance and Discriminant Function Analysis could be used in this paper. However, there are two major differences between the two techniques that make the latter method more suitable for the present study. In ‘Discriminant Function Analysis’ the x and y variables are interdependent and have the same logical status (having similar categories). In ‘Analysis of Covariance’, on the other hand, the x variables are covariance variables and the y variables are dependent. The second major difference between the two methods is that the ‘Analysis of Covariance’ incorporates one or more treatment or comparison variables, which are represented by the allocation of persons to two or more groups. In ‘Discriminant Function Analysis’ every person is treated as if he or she belongs to one and the same group. Thus the ‘Discriminant Function Analysis’ is considered the best technique to be used in differentiating between the formal and informal group of workers.

4. Data Source

Main source of data used in this paper is the ILO, School-to-work transition survey, Egypt, 2014.

5. Literature Review

Available researches highlighted the importance of individual socioeconomic characteristics, as one of the main determinants of informality (Traore, 2012). Individual characteristics and family background including gender, age, marital status, household size and parental occupation were found to impact occupational choice and the risk of informality by many studies as well. Similarly, results from various studies found that education increases the chances of getting better-paid jobs in the formal sector. Other factors such as place of residence, economic environment were also found to play a role in the occupational choice (Amer, 2014).

Although a great number of researches have been dealt with informality in Egypt, most of them have focused on measuring its size, trend, and trying to understand its characteristics. For example, El Mahdi (2000) dealt with the changing role of the informal sector in providing work opportunities to the growing labor force in Egypt in the late 90s. Her main concern is whether, and the extent to which, workers have become informalised during the period of economic structure reform.

In another study, Moktar & Wahba, (2000) investigated the degree of informality in the Egyptian labor market and found that the share of non-agricultural workers involved in informal sector has been increased by about 6% during the 1990, as more of the new entrants to the labor market have been drawn into informal employment. In the early 1970s, some 20 % of workers used to start their working life with informal jobs, but by 1998, approximately 69 % of new workers have started in informal employment.

Few recent studies have focused on the main features of the informal enterprises in Egypt, the role they play in employment creation, the sources of funding their activities, their ability to survive and the problems they encounter in their daily transactions, for example see Abdelhamid and ElMahdi (2003). Another supporting study carried out

by McCormick and Wahba (2004) concluded that the Egyptian labor market has experienced an increase in the informalisation of “new” workers, as they found that the predicted probability of a new entrant being informal in 1998 was 8% more than in 1990.

Others have examined the characteristics of informal workers, for example, Wehba (2009) in addressing the mobility from informal to formal sector in Egypt, she examined the characteristics of informal workers in 1998 and 2006, and found that although there has been a slight increase in the proportion of women; and informal employment is still male dominated. Also, she found that there has been an increase in the share of 20-29 years old among informal workers. She also suggests that the share of illiterate workers among informal workers has declined, as there was an increase in the share of those with intermediate education and university graduates among informal workers in 2006.

Angel-Urdinola and Tanabe (2012) studied the effect of the micro determinants of informal employment in the Middle East and North Africa (MENA) region. Using probit model, the results for Egypt showed that place of residence, gender, marital status, and age are the main factors of informality. Also, urban workers are found to be 9.5 % less likely employed informally than workers in rural areas; being a male worker is associated with a 12 % lower probability of being employed informally; being married is associated with a 13.9 % lower probability of working in the informal sector. Adults thirty-five and older are 29.2 % less likely to work in the informal sector than youth aged fifteen to twenty four. More education is associated with a lower probability of being employed in the informal sector.

Addressing patterns of labour market insertion in Egypt, Amer (2014) found that precarious employment (informal wage work and unpaid work) largely dominates, as among the 66.7% of young men who had a paid first job, more than half of them had informal wage work (51.7%). She also concluded that the evolution of the first labor market status from 1998 to 2012 clearly shows that the share of informal employment has increased (from 42.5% to 51.7%). She also found that education is a key factor affecting young men and women entering labour market, as the more educated the more the share of protected types of employment at the expense of precarious employment. She found that private informal employment decreases gradually with education from 63.1%

among the least educated young men to 24.4% among the most educated. Moreover, Hanan and Racha, (2014), stated that education is an important factor in describing informality; the less educated is the individual, the higher probability is to be working in informal job. They found that 68.6% of illiterate waged workers belong to the informal sector, while 85% of wage workers with university degree are in the formal sector. Their results confirm that informality is concentrated among the less educated and low skilled occupations in rural areas.

Although some literature address the socioeconomic factors of informal works, the current paper will examine the factors that influence youth's choices into labour market in Egypt by discriminating between formal and informal sector workers.

6. Conceptualization of the Informal Sector⁴

Discussion on the informal sector conceptualization through range of literature on the Less Developed Countries with the main focuses on Egypt covers the terms and definitions used, the framework in which the informal sector theoretically operates, determinants and factors that assumed or explored to affect the informal sector whether the starting point or its growth.

Literatures suggest that a universal definition of the informal sector cannot hold true for every single country context. In addition, instead of defining the informal sector unites a shift occurred toward defining the informal sector workers.

The conceptualization and the framework in which the informal sector operates have changed over time. From the tripartite division of activity that failed to represent the heterogeneity of activities found under each subsystem, to the sectorist school that view the informal and the formal parts of the economy as two sectors operating under one economic system characterized by either a complementarity or competitiveness relationship. Informal sector within the Arab countries is assumed to be operating within the sectorist view. In identifying the informal sector workers, **three main criteria** are suggested; include **non-registration**

⁴ For more literature see El-Bakly, (2016).

of the workplace, lack of social insurance and lack of health insurance.

It worth mentioning that, a shift of discourse on notion of the informal sector in Egypt is a substantial change, from the notion “**margins**” of the “modern” economy to the “**engine of growth**” of the economy. Till the end of the 1960s, the informal sector (margins population) was a problematic segment. After 1960’s, this problematic segment became a solution to the economic crisis just by redefining it to the “engine of growth” and suggesting that it can play an important role in addressing employment crisis.

It seems that the determinants or factors that affect the starting point of the informal sector differ between Developed and Developing Countries, while there are common factors between the two groups that affect its growth. The failure of the modern economy in the Developed Countries to provide sufficient jobs for the growing number of job seekers could be the starting point of the informal sector, while the sudden penetration of capitalism associated with twentieth-century techniques may have created the initiatives of the informal sector in the Developing Countries.

On the other hand, informal sector growth in Developed and Developing Countries is affected by same factors: regulations and legislation, economic recession, and macro-economic policies. On the micro level factor, poverty, education, and skill level are those factors that influence the growth of the informal sector.

7. Characteristics of the Survey Sample

7.1 Individual Characteristics

Table (1) shows some selected background characteristics of the sampled population, the figures show that out of the (5758) individuals, 51.7% are male, more than 70% are less than 25 years of age, with the mean age 21.4 years, and 44.9% have an urban background. In such young populated sample, it is expected to find about 38% of the sample cases still enrolled in schools (2176 individuals). For those who completed their education, more than 75% of them have an intermediate level of education or lower. Also, for a young population, it is not astonishing to find three quarter of the sampled individuals either less

than the legal age of marriage (24%) or never married (50.5%). Almost 30% are currently working (either paid or un-paid worker or self-employed), while 5.7% are unemployed (worked before) and 7.5% searching for work for the first time, and the remaining 57.4%, seemed to be still enrolled in the education system, as they never worked and never searched for work.

Table 1: Survey sample by selected background variables

	Number	%
Gender		
Male	2975	51.7
Female	2783	48.3
Total	5758	100
Urban / Rural		
Urban	2586	44.9
Rural	3172	55.1
Total	5758	100
Current age		
15-19	2298	39.9
19-24	1830	31.8
25-29	1630	28.3
Total	5758	100
Mean age	21.4	
Median age	21.0	
SD	4.3	
Educational level		
Illiterate	86	2.7
Read & write	206	6.4
Less than intermediate	784	24.3
Intermediate	1381	42.9
Above intermediate	134	4.2
University & above	631	19.6
Subtotal	3222	100.0
Other*	2536	44.0
Total	5758	100.0
Marital status		
Less than the legal age	1381	24.0
Never-married	2905	50.5
Married	1432	24.9
Widowed & divorced	40	0.7
Total	5758	100
Principal work status		
Paid or un-paid worker or self-employed	1693	29.4
Currently not working but worked before	329	5.7
Never worked and search for work	429	7.5
Never worked and never searched for work	3307	57.4
Total	5758	100.0

Source: Constructed from the ILO, School-to-work transition survey, Egypt, 2014.

* Those who either still enrolled (2176 individual) or dropout from school.

7.2 Family Characteristics

The available family and background characteristics of the sampled population are shown in table (2), the figures show that the majority belongs to a very educationally poor parent, more than 61% their fathers have less than intermediate level of education, and 55% of them have an illiterate father. The case of mother's education is worse, as about 70% of the sample have a mother with less than intermediate level of education, and more that 77% of them have an illiterate mother. Also, the figures show that the majority (63.6%) of the sample stated that they belong to families with an average financial status, the remaining are almost equally distributed among (very good or good) and (poor or very poor).

Table 2: Survey sample by selected family and household background variables

	Number	%
<i>Father level of education</i>		
<i>Illiterate</i>	1990	34.6
Read & write	831	14.4
Less than intermediate	772	13.4
Intermediate	1168	20.3
Above intermediate	202	3.5
University & above	768	13.3
Other	27	0.5
Total	5758	100
<i>Mother level of education</i>		
<i>Illiterate</i>	3145	54.6
Read & write	393	6.8
Less than intermediate	533	9.3
Intermediate	1039	18.0
Above intermediate	158	2.7
University & above	483	8.4
Other	7	0.1
Total	5758	100
<i>Financial status of the family</i>		
Very good	117	2.0
Good	959	16.7
Average	3663	63.6
Poor	902	15.7
Very poor	117	2.0
Total	5758	100.0

Source: Constructed from the ILO, School-to-work transition survey, Egypt, 2014.

8. Identifying the Target Group

As discussed before, three main criteria can be used to differentiate between the informal and formal sector workers: non-registration of the workplace, lack of social insurance and lack of health insurance. Therefore, among the (5758) sampled individuals, there are (1758) individuals were selected as they are currently working (within the reference week), out of them, those who work for the government, NGO's or non-profit organization (NPO's), international or diplomatic agency, unspecified agency were excluded. The remaining (1489 individuals) are working either in private sector (paid or self-employed) or in family business (see Table 3). Egypt school-to-work transition survey includes variables on registration of the workplace, availability of a work contract, and availability of social and medical insurance services. For simplicity reason, among those who are operating in the private sector (paid or self-employed or in family business), and working in unregistered firm or have no contract would be considered as informal sector workers. By applying this operational definition, Table (3) shows that the majority of the workers fall into the informal sector category, as 71.2% of the sampled workers were classified as informal sector works, and the remaining 28.8% have formal sector job.

Table 3: Selected sample by work status, type of work place and formality

	Number	%
Principal work status		
<i>Paid work</i>	1378	23.9
<i>Employer</i>	62	1.1
<i>Self-employed</i>	99	1.7
<i>Unpaid family worker</i>	236	4.1
<i>Unpaid other worker</i>	10	.2
Subtotal	1785	31.0
<i>Did not work</i>	3973	69.0
Total	5758	100.0
Type of work place		
<i>Government or public sector</i>	161	9.0
Private sector	848	47.5
<i>NGO's</i>	8	0.4
Private business	423	23.7
Family business	218	12.2
<i>International or diplomatic agency</i>	7	0.4
<i>Other</i>	120	6.7

	Number	%
<i>Total</i>	1785	100.0
<i>Sampled workers by formality</i>		
<i>Formal</i>	429	28.8
<i>Informal</i>	1060	71.2
<i>Total</i>	1489	100.0

Source: Constructed from the ILO, School-to-work transition survey, Egypt, 2014.

9. Background and Family Characteristics (Formal versus Informal)

9.1 Gender

Both formal and informal sector workers are predominantly male (Table 4). This is more evident in the case of informal sector workers since over 87% of them are male, while the female informal sector workers account for as little as 12.2%. The formal type of worker is little different, although it is still dominated by males, female workers account for about 18% of the formal sector workers.

9.2 Current Age

Informal sector workers are on average more than one and half year younger than their formal counterparts (the mean age are 22.58 and 24.14 years respectively) (Table 4). Looking at the distribution by age groups is also indicative. About half of the formal sector workers belong to the age group (25-29), and about (38%) dominated within (20-24) age brackets, and only about (12%) belongs to the (15-19) age brackets, while the informal sector counterparts are almost scattered across all of the age groups, with higher proportion of informal sector workers fall in the first age group than their formal counterparts, which means that child labour phenomenon is slightly evident among the informal sector.

9.3 Place of Residence (Urban / Rural)

Current place of residence (urban / rural) conform to the suggestion that informal sector workers are a rural phenomenon as workers in rural areas are more likely to begin their working life in an informal jobs compared to formal labourers. More than (60%) the formal sector workers are currently live in urban areas, while about (33%) of the

informal sector workers live in urban areas. The situation is reversed with respect to rural place of residence. The proportion of the formal sector workers living in rural areas is much lower than that of their informal sector counterparts.

Table 4: Workers by formality status and some selected background variables

	Formal	Informal
Gender		
Male	82.1%	87.8%
Female	17.9%	12.2%
Total	100	100
Current age		
15-19	12.4%	28.1%
19-24	38.0%	34.8%
25-29	49.7%	37.1%
Total	100	100
Mean age	24.14	22.58
SD	3.46	4.06
Place of residence (Urban / Rural)		
Urban	60.8%	32.9%
Rural	39.2%	67.1%
Total	100	100
Marital status		
Less than the legal age	5.1%	13.4%
Never-married	72.0%	63.1%
Married	22.4%	23.1%
Widowed & divorced	0.5%	0.4%
Total	100.0%	100.0%
Level of education		
Illiterate	2.5%	4.4%
Read & write	2.8%	9.6%
Primary school	9.6%	19.7%
Intermediate school	8.1%	9.6%
Public highs school	2.0%	3.2%
Technical highs school	35.9%	41.0%
Above highs school	5.1%	2.7%
University & above	34.1%	9.8%
Total	100.0%	100.0%
Formal education or training experiences		
Yes	98.1%	89.0%
No	1.9%	11.0%
Total	100.0%	100.0%
Principal work status		
Paid worker	84.6%	70.2%
Employer	5.1%	3.7%
Self-employed	3.5%	7.1%
Un-paid family worker	6.1%	18.6%
Un-paid other worker	.7%	.5%
Total	100.0%	100.0%

Source: Constructed from the ILO, School-to-work transition survey, Egypt, 2014.

9.4 Marital Status

There is only a small difference between formal and informal workers regarding all marital status categories, with the exception of less than the legal age as the gap between the formal and informal sector groups is clearly evident. The proportions of informal sector workers that belong to the first marital status category are higher than those found among their formal group correspondents.

9.5 Level of Education

Education data conform to the suggestion that informal labourers are poorly educated compared to formal labourers. More than half the formal sector workers have higher than intermediate levels of education (77.1%), while about (56.7%) of the informal sector workers belong to this same education category (Table 4). With respect to all other lower education categories, the situation is reversed. The proportion of the formal sector workers is lower than that of their informal sector counterparts. The share of informal sector workers with intermediate or lower level of education is almost doubles that of the formal sector workers (43.3% and 23% for both groups respectively). Therefore, how important is education in determining young individuals' working lives?

9.6 Formal Education or Training Experiences

It seems that joining formal education or training can determine young people in joining the labour market. Although the difference between formal and informal workers regarding being in formal education or training is small, the gap between both groups is evident. The proportions of formal sector workers that join formal education or training are higher by (9) points than their informal group correspondents.

9.7 Principal Work Status

Data suggests that principal work status is not of great importance in measuring differences between formal and informal sector workers as proven in previous studies. As Table (4) indicates, the majority (84.6%) of formal sector workers and about (70%) of the informal sector workers are paid workers. The gap between the two groups is clear with respect

to self-employed and un-paid family worker categories. The share of the informal workers self-employed is double than formal workers self-employed, the gap reaches tribble with respect to un-paid family worker category.

9.8 Age at First Marriage

Although, the sampled individuals are relatively young, more than a quarter are ever married, among those, the data shows there is no significant difference between formal and informal workers with respect to age at first marriage as the majority of both groups are getting married in the (20-24) age brackets. However, the share of the informal workers who get married as early as in the (15-19) age group is more than double than that of the formal correspondents. The situation is reversed with regard the older age group (24-29).

9.9 Number of Children

Number of children seems to have a significant importance in differentiating between formal and informal sector workers. The gap between formal and informal workers regarding all number of children categories is evident, especially the first and last brackets where more than half of the formal sector workers while about 38% of the informal sector workers have one child. And the share of the informal sector workers with three or more children is double than their formal group correspondents.

9.10 Family Characteristics

Data on financial status of the family (Table 5) show that, as found among the total sample, the majority within formal and informal workers (66.9% and 62.5% respectively) stated that they belong to families with an average financial status, however, with regard to the (very good or good) and (poor or very poor), the gap between formal and informal sector workers is wider. The share of the informal worker group who stated that they belong to (poor or very poor) family is almost double of their formal correspondents (27% and 13.8%). The situation among (very good and good) category is reversed. In conclusion, financial status of the family can be an important factor in differentiating between formal and informal sector workers.

Data on father and mother educational level can also be an important factor in differentiating between formal and informal sector workers. The data show that while the majority among both groups belongs to the very educationally poor parents, it shows that parents of the informal sector workers are educationally less advantage compared to their formal correspondents. Data on father education show that about 55% of informal workers' fathers are illiterate, while their formal counterparts figure is about 30%, while the mother situation is worse as more than 77% of the informal workers' mother are illiterate, while the figure among formal workers is 51%. This can lead to a suggestion that financial burden of the family associated with low level of education of the parents are significant factors influence young people choices in entering labour markets in Egypt.

Table 5: Workers by formality status and some demographic and family background variables

	Formal	Informal
<i>Age at first marriage</i>		
15-19	8.6%	17.9%
20-24	61.3%	64.2%
24-29	30.1%	17.9%
Total	100.0%	100.0%
<i>Number of children</i>		
1	52.7%	37.6%
2	36.5%	41.8%
3 and above	10.8%	20.6%
Total	100.0%	100.0%
<i>Financial status of the family</i>		
Very good	3.7%	.9%
Good	15.6%	9.4%
Average	66.9%	62.5%
Poor	11.9%	24.3%
Very poor	1.9%	2.7%
Total	100.0%	100.0%
<i>Father level of education</i>		
Illiterate	30.1%	55.3%
Read & write	16.3%	16.7%
Less than intermediate	14.5%	12.3%
Intermediate	17.5%	11.1%
Above intermediate	4.0%	1.4%
University & above	17.2%	2.4%
Other	.5%	.8%

	Formal	Informal
Total	100.0%	100.0%
<i>Mother level of education</i>		
<i>Illiterate</i>	51.0%	77.4%
Read & write	6.8%	6.3%
Less than intermediate	11.7%	5.7%
Intermediate	16.3%	8.6%
Above intermediate	2.6%	0.8%
University & above	11.4%	1.2%
Other	.2%	.0%
Total	100.0%	100.0%

Source: Constructed from the ILO, School-to-work transition survey, Egypt, 2014.

10. Interpreting Chi-squared Values

Table (6) presents X^2 , d.f., and P values for each anticipated characteristic. The figures of the table suggest that three quarter the background and family characteristics have a highly significant level of differences between the two groups. Current Age, place of residence (urban / rural), marital status, formal education or training experience, principal work status, financial status of the family, father level of education, and mother level of education have a significant importance in differentiating between formal and informal group of respondents.⁵ Age at first marriage and gender comes next, and the remaining variables (level of education and number of children) have a moderate level of significance (at about 0.2%).

⁵ All of these variables have a P value of less than 0.02. This means that the probability is less than .02% that such observed difference in these variables could have been arisen by chance.

Table 6: Chi Squared test values for the comparison between formal and informal workers

Variables	X²	d.f	P
<i>Gender</i>	8.556	1	0.003444
<i>Current age</i>	60.099	14	<0.001
<i>Urban / Rural</i>	98.402	1	<0.001
<i>Marital status</i>	25.789	5	<0.001
<i>Level of education</i>	9.479	7	0.220055
<i>Formal education or training experiences</i>	33.416	1	<0.001
<i>Principal work status</i>	48.868	4	<0.001
<i>Age at first marriage</i>	8.557	2	0.013866
<i>Number of children</i>	6.308	4	0.177275
<i>Financial status of the family</i>	48.646	4	<0.001
<i>Father level of education</i>	168.479	10	<0.001
<i>Mother level of education</i>	149.695	9	<0.001

Source: Constructed from the ILO, School-to-work transition survey, Egypt, 2014.

11. Discriminating Between the Formal and Informal Sector Workers (Statistical Assessment)

1.1. Differences Between Formal and Informal Sector Workers

‘Discriminant Function Analysis’ is applied in this subsection to investigate the differences between the two labour market groups (formal and informal) with respect to a selected set of socio-economic and demographic variables.

1.1.1. Mean Values of Discriminating Variables

Table (7) presents the mean values and standard deviations of the selected background characteristics for the two sector groups. Workers in the two sector groups differ markedly in some ways and show similarities in others. The two groups are different with respect to respondents education and parents level of education, as Informal sector workers seem to be less educated, having less advantage parents’ level of education compared with their formal sector counterparts. Both groups seem to be similar with respect to their other variables included in the analysis, with some standard deviations differences in some variables as in the case of marital status and financial status of the family.

Table 7: Mean and standard deviation values of selected variables used to differentiate between formal and informal sector workers

Selected Variables	Formal		Informal	
	Mean	S. D.	Mean	S. D.
<i>Gender</i>	1.14	.348	1.17	.377
<i>Current Age</i>	26.53	2.207	26.56	2.136
<i>Urban / Rural</i>	1.53	.503	1.72	.450
<i>Marital Status</i>	4.04	.354	4.02	.142
<i>Level of Education</i>	5.94	1.815	5.03	1.807
<i>Formal education or training experiences</i>	1.00	0.000	1.00	0.000
<i>Principal Work Status</i>	1.56	1.073	1.95	1.430
<i>Age at first marriage</i>	22.74	2.512	21.86	2.528
<i>Number of Children</i>	1.63	.759	1.79	.778
<i>Financial status of the family</i>	2.96	.795	3.03	.596
<i>Father Level of Education</i>	4.32	11.418	3.84	13.823
<i>Mother Level of Education</i>	3.68	11.479	1.53	1.351

Source: Constructed from the ILO, School-to-work transition survey, Egypt, 2014.

11.1.2 Discriminant Function Coefficients

To examine the contribution of the individual variables, the discriminant function coefficients is used. There are two types of coefficients, unstandardized and standardized coefficients. While the former tells us the absolute contribution of a variable, this information may be misleading when the meaning of one unit change in the value of a variable is not the same from one variable to another. Thus, we must go beyond the unstandardized coefficients if we want to know the relative importance of a variable, i.e. the standardized coefficients should be examined.

a. The Unstandardized Coefficients

Interpreting the discriminant functions can be done by either (1) examining the relative positions of the data cases and group mean (known as group centriods) or (2) studying the relationship between the individual variables and the calculated function. Here, the first approach is adopted. In calculating the discriminant score, the discriminant functions (unstandardized), which are exhibited in Table (8), were multiplied by the raw variable values, the product summed and then added to the constant (shown in the same table) to give the discriminant score. This procedure provides the values of the discriminant scores

(.550 and -.269) for the formal and informal sector workers respectively. This means that each positive sign indicates a push towards the formal group, whereas the negative sign means a pull towards the informal group. Accordingly, place of residence, principal work status, current age, and financial status of the family are important variables in identifying the informal workers. By contrast, all the remaining variables can be used in identifying the formal group of workers.

Table 8: Discriminant function coefficients, and structure matrix coefficients

Selected Variables	Discriminant Function Coefficients		Structure Matrix	
	Unst.	St.		
<i>Gender</i>	.380	.140	<i>Level of Education</i>	.615
<i>Current Age</i>	-.241	-.521	<i>Urban / Rural</i>	-.505
<i>Urban / Rural</i>	-.718	-.336	<i>Age at first marriage</i>	.422
<i>Marital Status</i>	.086	.020	<i>Mother Level of Education</i>	.394
<i>Level of Education</i>	.312	.564	<i>Principal Work Status</i>	-.366
<i>Principal Work Status</i>	-.318	-.422	<i>Number of Children</i>	-.260
<i>Age at first marriage</i>	.266	.670	<i>Financial status of the family</i>	-.126
<i>Number of Children</i>	.393	.303	<i>Marital Status</i>	.111
<i>Financial status of the family</i>	-.116	-.078	<i>Gender</i>	-.104
<i>Father Level of Education</i>	-.016	-.204	<i>Father Level of Education</i>	.044
<i>Mother Level of Education</i>	.048	.319	<i>Current Age</i>	-.021
(Constant)	-.534	--		

Source: Constructed from the ILO, School-to-work transition survey, Egypt, 2014.

Unst.: Unstandardized coefficients.

St.: Standardized coefficients.

b. The Standardized and Structure Matrix Coefficients⁶

The standardized coefficients (Table 8) are helpful because we can use them to determine which variable contributes most to the function. This is done by examining the magnitude of the coefficients (ignoring its sign), The larger the magnitude the greater is that variables contribution. The figure in the table show that age at first marriage has the highest

⁶ Standardized coefficients are the ones that would be obtained if all original data had been standardized so as to have a mean of 0 and a standard deviation of 1.0. We can compute the standardized coefficients (C's) from the unstandardized ones (U's) by using the following transformation (Klecka, 1980; Norusis, M.J/ SPSS Inc, 1994):

$$C_i = U_i / \sqrt{W_{ii} / (n - g)}$$

Whereas W_{ii} is the sum of squares for variable i , n is the total number of cases, and g is the number of groups.

contribution, followed by level of education, current age, principal work status, and place of residence (urban / rural). The remaining variables come next with lower contribution to the function. However, structure matrix shows that level of education is the larger predictor variable followed by place of residence, age at first marriage, mother level of education and work status.

12. Accuracy and Test of Significance of the Discriminant Functions

For every statistical analysis, there are always ways to determine the extent to which the analysis provides accurate and reliable results. As far as 'Discriminant Function Analysis' is concerned, two methods can be used to measure the accuracy and significance level of the derived results. Both methods will be used here. However, some advantages and disadvantages of the analysis worth to be mentioned.

12.1 Advantages

The following are the main advantages of the analysis:

- The predictor variable (the independent one) should be and are not highly correlated (see Annex (1)).
- In terms of sample size, the smallest group exceeds the predictor variables, as it must be.
- As for Box's M, the result shows that the analysis is highly significant (at 0.000) in rejecting the null hypothesis of equal population.

12.2 Disadvantages

The following can be considered as disadvantages of the analysis:

- As case processing summary table shows only (219) cases were valid as 1270 cases have at least one missing discriminating variable.
- As the test of equality of group means shows that Wilks' lambda of most of the predictor variables are not statistically significant, level of education has the highest significant level (0.001), followed by place of residence (0.004), age at first marriage (0.017), and mother educational status (0.026). The rest of the variables has lower level of significance.

- The larger the eigenvalue the more variance functions explains in the dependent variables, and as eigenvalue as low as 0.149, and the canonical correlation is as low as (0.360), this means that there is a need for another analysis to support the results of the current one.

12.3 Accuracy of the Derived Discriminant Functions

The purpose here is to investigate the adequacy of the derived discriminant function. In that respect, the second type of the discriminant function's activities, which is the classification function, is dealt with. Classification is the process by which a decision is made that a specific case belongs to or most closely resembles one particular group. This could be done by calculating a classification score for each case on each group using the same way of calculating the discriminant score. Each case is then classified into the group in which it has the higher score. The output of this procedure is presented in Table (9).

Table 9: Comparison between actual and predicted classification for formal and informal workers

Actual Groups		Predicted Group Membership		Total %
		Formal %	Informal %	
Original	Formal	56.2	43.8	100
	Informal	35.9	64.1	100
Cross-validated	Formal	18.4	81.6	100
	Informal	57.7	42.3	100

Source: Constructed from the ILO, School-to-work transition survey, Egypt, 2014.

a Cross validation is done only for those cases in the analysis. In cross validation, each case is classified by the functions derived from all cases other than that case.

b 61.8% of original grouped cases correctly classified.

c 35.4% of cross-validated grouped cases correctly classified.

Figures in Table (9) show the classification matrix for the two worker groups. The diagonal elements are the number of cases classified correctly, according to the model, into the groups. For example, 56.2% of the formal sector workers are classified correctly and 64.1% of the informal workers are classified correctly, according to the model. The overall percentage of cases classified correctly is the sum of the number of cases classified correctly in each group divided by the total number of

cases. The proportion of respondents who are correctly classified into formal and informal sector groups is equal to 61.8%, which is higher than the expected percentage of correct classification (50%) if assignment were made randomly, but the improvement is moderate. This could mean that the discrimination power is moderately accurate.

There is another measure of the improvement called "proportional reduction in error statistics "TAU". In this case TAU is equal to 0.382, which means that classification based on the discriminating variables made 38.2% fewer errors than would be expected by random assignment.

The second panel of Table (9) represents the cross-validated classification matrix. The difference between the original and the cross-validated figures is that in cross validation, each case is classified by the function derived from all cases other than that case. The table shows that the proportion of cases that are correctly classified according to the model is (18.4%), when cross-validation is applied, is lower than that found when original grouping is applied (56.2%). However, the discrimination power is still moderately high and consequently can be defined as accurate.

12.4 Test of Significance of the Discriminant Functions

When there are no differences among the populations from which the samples are selected, the discriminant functions reflect only sampling variability. A test of the null hypothesis that, in the population, the means of all discriminant functions in the two groups are really equal and zero can be based on what is called "Wilks' lambda". "Wilks' lambda" is not just the ratio of the between-groups to within-groups sum of squares but is the product of the univariate Wilks' lambda for each function. Based on a chi-square transformation of the statistics, the significance level of the observed "Wilks' lambda" can be tested. The value of Wilks' lambda and its associated chi-square value, the degrees of freedom, and the significance level are 0.870, 29.425, 11, and 0.000. this means the null hypothesis that the means of both functions are equal in the two populations can be rejected. In other words, the two populations (the informal and the formal) are different.

13. Conclusion

The main purpose of this paper is to formulate a clear idea about the socio-economic and demographic background characteristics that affect the youth's choices in entering formal and informal labour markets in Egypt, through differentiating between those who enter the labour market as formal worker and those who fall into the informal sector group of work. Comparison between the two groups was attempted and particular attention has been directed to certain characteristics that are assumed to be the potential micro determinants for joining the informal labor market in Egypt and are included in the survey data. These include gender, age, marital status, education, principal work status, and some other socio-demographic characteristics. A 'Chi-squared' test and 'Discriminant Function Analysis' were applied as a statistical assessment in differentiating between the two groups.

The results confirm to the hypothesis that formal workers are different from those who join the informal labor markets. Informal sector workers are likely to be more male-dominant, younger, mostly reside in rural areas, poorly educated, have no-formal education or training experiences, have more children, comes from a financially poor families, and educationally less advantages parents, compared with their formal labor counterparts. The two groups seem to be similar with the rest of the variable included in the analysis. These characteristics seem to hinder young people from joining the formal sector group of work. Respondent level of education, place of residence, age at first marriage, parents' level of education, and principal work status made the greatest contribution in differentiating between the two groups. Those variable works as the most predictor variables of the informal workers.

14. Recommendations

As Informality is quite prevalent in developing countries including Egypt, and also in low- and middle-income countries. Also, as mentioned above, negative impacts of informality hits at all levels, individuals, households or institutions, and the economy as a whole. Therefore, attempts should be made to either deprive people from joining the informal sector or formalizing the informal sector. In doing so, any approach which recommends mandatory legislative, executive and judicial reforms aiming at depriving individual from joining the

informal sector will not be fully effective unless considering the socio-economic background of those who joined or intend to join the informal rather than the formal sector. Also, any attempts to integrate informal into formal sector on the individual or firm basis will go vain without knowing the main factors that play the major roles in determining people's choices in entering the labour market.

Moreover, with respect to policy making, one should keep in mind that any mandatory legislative, executive and judicial reforms should be accompanied with socio-economic policies aiming at providing individuals, for example, with the proper education and skills to meet the principal requirements, if any, to join the formal sector.

Based on the results of the current research, for eliminating freedom to choose between joining the formal and informal sectors or encourage people to join the formal sector, any policy-oriented recommendations for Egypt and for developing countries as well, should place formal education for everyone at the top priority of the government, with the main focus should be on financially less advantage families reside in rural areas.

Data wise recommendations is that a specific survey focusing on labour markets and examining the formality of workers should have more attention on the quality of data especially with respect to missing data, as it was a reason that more than 85% of the selected cases has at least one missing discriminating variable and were excluded from the analysis.

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Annex 1: Correlations matrix between variables

	<i>Gender</i>	<i>Current Age</i>	<i>Urban / Rural</i>	<i>Marital Status</i>	<i>Level of Education</i>	<i>Formal education or training experiences</i>	<i>Principal Work Status</i>	<i>Age at first marriage</i>	<i>Number of Children</i>	<i>Financial status of the family</i>	<i>Father Level of Education</i>	<i>Mother Level of Education</i>
<i>Gender</i>	1	-	-	-	-	-	-	-	-	-	-	-
<i>Current Age</i>	-.003	1	-	-	-	-	-	-	-	-	-	-
<i>Urban / Rural</i>	-.121	-.103	1	-	-	-	-	-	-	-	-	-
<i>Marital Status</i>	.064	.601	.079	1	-	-	-	-	-	-	-	-
<i>Level of Education</i>	.147	.407	-.196	.114	1	-	-	-	-	-	-	-
<i>Formal education or training experiences</i>	.180	-.021	.055	.063	. ^a	1	-	-	-	-	-	-
<i>Principal Work Status</i>	.124	-.121	.172	-.038	-.030	.112	1	-	-	-	-	-
<i>Age at first marriage</i>	-.454	.441	-.051	.050	.190	-.211	-.314	1	-	-	-	-
<i>Number of Children</i>	.181	.260	.123	-.095	-.168	.221	.073	-.460	1	-	-	-
<i>Financial status of the family</i>	.043	-.148	-.006	-.039	-.287	.194	-.044	-.069	-.012	1	-	-
<i>Father Level of Education</i>	.012	.028	-.066	.009	.118	-.050	-.042	-.033	.010	-.090	1	-
<i>Mother Level of Education</i>	.070	.064	-.239	-.013	.311	-.106	-.059	.027	-.094	-.178	.334	1

^a Cannot be computed because at least one of the variables is constant.

Investigating the Benefits of a Currency Union to Trade: A Case Study on WAMZ Countries

Tamsir Cham¹

This paper assesses the benefits of a currency union by using the West African Monetary Zone (WAMZ) and the traditional gravity model approach. This is the first investigative study on WAMZ's impact on trade using a modified gravity model approach that incorporates the instability index, which characterizes the zone. This approach is useful in checking the impact of a single currency on trade enhancement and the impact of the instability index on economic growth. Using an Ordinary Least Squares (OLS) with different specifications of the gravity model and panel data set consisting of bilateral trade observations on 9 countries from 1980-2014, the empirical findings supported the hypothesis that currency unions do have a significant positive impact on trade flows. The results indicated that impact of the currency union on trade in the West African countries considered exceeds 20 percent. It therefore suffices to state that a currency union leads to trade enhancement.

Keywords: Currency Union; Gravity Model; Trade;

JEL Classification: E52, E63, F15, F43

1. Introduction

The objective of this paper is to estimate the benefit of a currency union on trade flows. Since trade is the engine for growth and a currency union enhances growth through trade and the fact that the West African Monetary Zone (WAMZ²) has not progressed much in terms of growth, entering into a monetary union could serve as a stimulus for economic growth. The proponents of fixed exchange rate regimes argue that fixed exchange rates eliminate uncertainty, therefore, encourage trade and

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² West Africa Monetary Zone members are Gambia, Ghana, Guinea, Nigeria and Sierra Leone.

investment. Although there are costs associated with forgoing an independent monetary policy, the benefits that come with currency union minimize the costs. Furthermore, currency union tends to increase the degree of business cycles synchronization.³ This lowers the cost of foregoing national currencies. A currency union may to some extent increase the degree of efficiency and institutional arrangement of member countries. There is also credibility benefit that member countries derive as they enter into a monetary union⁴.

Before the European Monetary Union (EMU) came into being, researchers were continuously studying the impact of various exchange rate regimes on trade flows. Empirical results are generally mixed, and, there is no consensus about the impact of exchange rate regimes on trade flows. Since the introduction of the euro in 1999, renewed interest in exchange rate regimes, particularly the irrevocable fixed exchange rate and its impact on macroeconomic variables is gaining momentum in the literature. In the past decade, several studies have been conducted on the impact of currency unions on trade. Almost all the studies show that a currency union enhances trade. Trade enhancement impact came as a result of reduced transaction costs and exchange rate uncertainty; but will WAMZ be beneficial to member countries by enhancing trade? This question is an empirical one and is the main subject of this section. For the observers (Liberia and Cape Verde), the decision on when to join WAMZ may likely hinge upon the potential benefits and costs of joining the currency union. The experience of current WAMZ members since the run-up period (2000) will serve as a basis to determine the potential trade impact of WAMZ. Consequently, this paper answers the following questions: What is the potential impact of WAMZ on the area's trade flows? How has trade impacted by WAMZ changed over time? WAMZ can be viewed as a process because the physical currency notes and coins are not yet introduced. Therefore, any evaluation of the zone has to be taken as work in progress given the prevailing situation since 2000, the run-up period.

³ Frankel and Rose (1998) examined the relationship between currency unions and business cycles. Their findings reveal that business cycles become more synchronized across countries that are in a monetary union.

⁴ See Alesina and Barro (2000)

This paper attempt to contribute to the literature on the impact of monetary union on trade particularly the magnitude of the increased in trade flow. Although Rose (2000) initial estimate of EMU on trade continue to serve as a reference point, it has come under serious criticisms. This paper tries to add to the ongoing argument but focuses on the WAMZ region that have not been explore to larger extent.

The paper is set up as follows: In section 2, the literature pertaining to the impact of currency unions on trade flows is discussed, data set and methodology employed to undertake the empirical assessment is discussed in section 3, the empirical findings are discussed in section 4, and section 5 contains the summary and conclusion.

2. Literature Review

National borders, currency, and political links matter a lot in trade. A large body of research has dealt with the effect of borders on trade flows. McCallum (1995) studied U.S-Canadian trade and noticed a large difference in trade among Canadian provinces and in trade between Canadian provinces and states in the United States. His findings are as follows: trade among Canadian provinces was estimated at 2200 percent larger than trade between a state in the United States and a province in Canada. However, other researchers have questioned McCallum's findings. Anderson and Van Wincoop (2001) disagreed with McCallum and stated that the volume of the US-Canada border trade was over-estimated; their findings nonetheless indicate a large volume. They concluded that the borders inhibit trade among industrialized countries by about 30 percent and between the United States and Canada by 44 percent. These findings highlighted the impact of national borders on trade flows. National borders inhibit trade because of added trade cost.⁵ Since borders affect trade flows adversely, eliminating one of the components of border costs⁶ can have a huge positive effect on trade flows.

After the European Monetary Union (EMU) came into existence, many research papers have used the euro area to study the impact of currency

⁵ These cost includes trade cost; part of these trade cost is associated with countries using different currencies.

⁶ Cost associated with transaction and exchange rate uncertainty.

unions on macroeconomic fundamentals. Among the studies is one conducted on the currency union's (euro) impact on trade flows among its member countries and outside the zone. The research area has grown extensively over the past decade. Rose (2000) reported that bilateral trade between countries that use the same currency is at least 200 percent larger than trade between countries using different currencies. He discovered a significant effect of a currency union on trade flow.⁷ According to his findings, a currency union leads to a three-fold increase in bilateral trade among the union's members compared to non-members. A similar conclusion was reached in his article- "One Money, One Market: Estimating the Effect of Common Currencies on Trade".

Frankel and Rose (2000), using a 1970-1995 panel data set of over 180 countries and a five-year interval yielded similar results i.e. when two countries share a currency, trade is multiplied roughly threefold. Though an examination of year-specific effects shows a small tendency for the coefficient to rise over time between the 1970s and 1990s, the results are still significant. The Frankel and Rose (2002) results, when compared to those of McCallum (1995) and Helliwell (1998), received much attention in that the Frankel and Rose (2002) results have no link to geographic, linguistic, or trade policy.⁸ This result rekindled interest in the field. Since then both academia and policymakers have shown much interest in the search for the benefits that accrue to members of a common currency, and at the same time for the reliability of the Rose (2000) results.

Although subsequent studies find a smaller effect of a currency union on trade flows, the results still reveal the positive effect of currency unions on trade flows. Rose (2000) estimated the EMU's potential effect on British Trade. Using 1970-1995 bilateral trade observations spanning six different years and employing the gravity with sensitivity test, he concluded that British trade with the Euro-land could increase considerably if the United Kingdom joins the EMU. Therefore, the United Kingdom's trade with the Euro-zone could increase threefold, thus enabling overall British trade to double eventually.

⁷ In testing the robustness of his results, Rose (2000) cites results of qualitative and instrumental variables suggesting that most currency unions were not founded for the purpose of promoting trade among their members.

⁸ See Frankel and Rose (2000)

Glick and Rose (2002) contributed to the literature by using panel data techniques, including the “fixed-effect” estimator, which uses only a time-series variation and taking into account entry into and exit from a monetary union. They found a currency union helps trade to double. Alesina and Barro (2002) also investigated the relationship between currency unions and trade flows. In their model, they used the “iceberg”⁹ concept as trade costs between two regions or countries and concluded that countries that trade more with each other benefit more if they adopt the same currency. Micco and others (2003) also added to the literature and investigated the impact of the European monetary union on trade. Using a panel of 22 and 15 countries respectively, they investigated the direct contribution of the currency union on trade within the monetary zone. Using the gravity model, they found that the EMU enhances trade integration among the zone’s member countries, and its impact rises with time. Barro and Tenreyro (2003), using instrumental variables to address the endogeneity problem that surrounds the Rose (2000) results, arrived at the same conclusion: sharing a currency enhances trade. In their findings, they found that the endogeneity bias is not responsible for the large effect previously documented. Furthermore, using annual data from 1960 to 1997 for all pairs of countries, they employ both Ordinary Least Square (OLS) estimates and Instrumental-Variable (IV) specifications. Their estimate revealed surprising results in that OLS estimates of the currency union’s impact on trade surpassed that of the instrumental variable in both cases with and without country-fixed effects¹⁰. Consequently, their results revealed that endogeneity is not the reason for the large effect indicated by Rose (2000) and his co-authors.

Rose and Van Wincoop (2001) also surveyed the literature using national currency as a barrier to international trade. Using both the traditional gravity model and that of Anderson and Van Wincoop, they arrived at the same results. Although the Anderson and Van Wincoop model revealed relatively smaller results compared to the traditional gravity model, the currency union effect is still large. One beautiful feature of the Anderson and Van Wincoop model is that the currency

⁹ The iceberg concept is commonly used in trade theory. It states that the quantity originating from the exporter is not equivalent to the one the importer receives - A fraction is added to it.

¹⁰ Instrumental-Variables (IV) is used to curb the bias that might arise in measuring currency union impact on trade flows, which at the same time serves as a robustness test.

union effect on trade can still be estimated for countries that are yet to enter into a monetary union. Engel and Rose (2002) show that members of currency unions systematically engage in greater international trade. Using a 1995 data set consisting of 150 countries, the gravity model and the OLS estimation and taking into account the effects of output, size, and distance, their result reveals a large effect of common currency on trade. The estimates indicate that two countries that have a common currency trade together by a factor of approximately 6.5. When they included the extra controls, it did not invalidate their finding of an economically and statistically significant positive effect of the currency union on trade flows thus buttressing the previous findings.

Rose's (2000) estimate of the impact of a currency union on trade flows overwhelmed researchers and policymakers. The literature is growing rapidly, about 34 studies are being conducted on the subject, and each differs in magnitude, even though the results remain economically and statistically significant. Although there is considerable variation in the impact of a currency union on trade, the average of the impact on trade in the studies is 60 percent¹¹. It is reasonable to conclude that a currency union leads to an increase in the volume of bilateral trade.

Baldwin, Skuderny and Taglioni (2005) studied the impact of EMU on trade using a proposed theoretical model and sectoral dataset. According to their theoretical model, in a monopolistic competition set-up the effect of exchange rate uncertainty on trade has a non-linear feature suggesting that EMU and exchange rate uncertainty jointly significant. Their empirical findings revealed that currency union have a trade creating effect between 108 and 140 percent and between 54 to 88 percent in a pool regression and individual sector estimates respectively. They also found that third countries (non-EMU countries) would increase their trade with EMU by 27 percent since the creation of the EMU.

Baldwin and Taglioni (2007) provided a minimalist deviation of the gravity model and used it in identifying common errors. They argued that the gravity model originates from one of the principles of physics and not a model by itself, which unfortunately is apply in trade theory.

¹¹ See Rose, Andrew K. (2004a) "A Meta-Analysis of the Effect of Common Currencies on International Trade"

Hence, in the gravity model, endogenous variables are regressed on endogenous variables. They criticized earlier estimations using the gravity model by Rose et al (2000) which they summarized as Gold, Silver and Bronze medal errors.

Frankel (2008) investigated why the large differences between Rose (2000) estimates of currency union effect on trade and the estimates by Micco, Ordóñez and Stein done after the introduction of EMU. He used three possible explanations to explain the 15% and 200 % gap namely Euro is still at early stage, the size of the Euro member countries are larger than countries who had formed currency unions and endogeneity effect which could lead due to spurious which is a revelation of reserve causality. However, his finding revealed no evidence that these factors could explained large gap between Rose estimates and estimates by others.

Baier and Bergstrand (2009) motivated to solve the border puzzle of Canadian-U.S. trade, theoretical foundations for the gravity equation of international trade focusing more endogeneity of multilateral resistance term developed by Anderson and van Wincoop (2003). They found that multilateral resistance are critical but nonlinear estimation are not hence identical results are obtained even by using *bonus vetus* ordinary least squares estimation method. They recommend the use of Taylor series expansion to estimate the multilateral resistance term. The log-linear estimation approach helped in estimating the relationship among bilateral trade flows, regional and world income, and bilateral, multilateral, and world resistance terms.

Cham (2011) investigated the cost of membership in the West African Monetary Zone (WAMZ) region from 1980 to 2005 using General Least Squares (GLS) and single equation method to estimate the real exchange rate misalignment. The empirical findings revealed that real exchange rate variability has increased across WAMZ from 2000 to 2005, which indicates that monetary union imposed high cost to member countries and hence called for member countries to put their macroeconomic fundamentals in order.

De Sousa (2012) used theoretical model spanning 60 year period from 1948 to 2009, he found that currency union impact on trade showing a decline trend. In addition, his findings revealed that trade and financial

globalization currency unions become less important in enhancing trade. Cindea and Cindea (2012) performed a meta-analysis of 28 most recent studies on currency union effect on trade to assess how significant has trade been impacted since the introduction of the euro using Rose's initial estimates as beach mark. Their findings revealed that even though recent estimates of the currency union impact on trade flow has been relatively below that of Rose, trade has intensified since the introduction of the single currency which is one of the successes of euro. They concluded that the recent low estimates need to be considered as a work in progress since the euro is relatively young and it will take time for the Euro impact on trade to reach its optimum percentage point. They concluded that Rose estimates should be used as a reference point in further research in the field. Prera (2012) used the stochastic frontier analysis to study the effects of political stability and economic integration on technical efficiency using a set of industries in Central America. They found economic integration had a negative effect on technical efficiency during the period although the effect of political instability depends on the type of event, both at the industry and national level. Cham (2016) investigated the relationship between monetary integration, foreign direct investment (FDI) and trade in WAMZ using annual data from 1980 to 2013. He found monetary integration positively influenced FDI flows. According to his empirical results, FDI and trade are complementary.

3. Data and Methodology

3.1. Data

The trade data set consists of bilateral trade observations spanning 35 years. We used annual bilateral trade data from WAMZ member countries with rest of the world from 1980 through 2014. Trade on FOB exports and CIF imports are recorded in U.S. dollars. We used exports plus imports as a percentage of GDP to measure bilateral trade. We then added a number of other requisite variables to estimate the gravity model. We added population and real GDP (Gross Domestic Product) per capita as dependent variables. These variables were obtained from the World Bank's World Development Indicators (WDI 2015) database. However, some observations were omitted because of unavailable data.

Information on land areas, common borders, common languages, common colonizers, and free trade agreements are extracted from the CIA's 'World Fact Book'. Distance is determined from the great circle distance measured as distance between countries' principal cities. We used kilometers per square as a measurement scale for distance. The instability index data used are the ones developed by Anthony Annett. Finally, we added information country-pairs that are in a currency union. By currency union, we mean that money is interchangeable between the two countries at a one to one par for an extended period; so prices of commodities need not be converted when trade is between a pair of countries. Standard Augmented Dickey-Fuller (ADF) unit root test suggests that all variables are stationary at level. Appendix A, Table A1 contains the unit root tests results.

3.2. Methodology

The gravity model has been a successful tool in rendering empirical work in international economics in general and in trade in particular. This device has been in use for more than a quarter of a century, particularly in policy studies and in international macroeconomics. The works of Leamer and Stern (1970) shed light on the gravity model, and they noted that bilateral trade is unjustified in the absence of trade cost, such as transportation expenses. Anderson (1979) formulated a neat eloquent theoretical foundation of the gravity equation. In his work, he developed a linear expenditure system on the assumption that the preferences for a country's goods are homothetic and uniform across importing countries. In his setting, the gravity model is specified so that the share of national expenditure is accounted for by spending on tradable goods in a reduced-form function of income and population.¹² Put differently, trade flow is positively related to the income and population of the two regions or countries that engage in trade. Though the model has the advantage of conducting cross-sectional budget studies, its main limitation is the bias of measuring transit cost. However, he subsequently improved the model to gain support at the expense of cost bias. Integrating distances which is used as a proxy to transport cost and border taxes produces a full model that may

¹² In his expenditure model of the gravity equation, the flow of goods or factor input from one region to another depends on the combination of income and population of the two regions or countries.

subsequently lead to the need for tariff elasticity¹³. Anderson's conclusion on the subject is that the need to keep a trade-off between efficiency and bias characterized the gravity model.

Bergstrand (1985) approached the subject from a utilitarian viewpoint. This approach helped him to prove that imports are a closer substitute for each other than for domestic goods.¹⁴ In his work, the imperfect substitution theory incorporated a role of shipping costs, which is regarded as modern-day distance. It has been subsequently argued that the best equation for the gravity model depends on the product of the GDPs. This piece of work came as a contribution made by Helpman (1987), Helpman, and Krugman (1985). The authors, however, claimed that the classical Heckscher-Ohlin theory of comparative advantage does not have the property that indicates that bilateral trade depends on the product of incomes as it does in the gravity model. Deardorff (1984) agreed to this argument, and his work provided the partial foundation of the gravity equation. However, recently, Deardorff (1997) discovered the way to formulate the gravity equation from the Heckscher-Ohlin theory in a way similar to the way it was derived from the imperfect substitution theory. Though he came up with different empirical results using the two theories, the theme was to show that there are alternative ways to derive the gravity equation from other theories.

Linguistic and other historical and cultural affinities help to reduce trade cost. Such cost is sometimes referred to as "cost of unfamiliarity". Linnemann (1966) and Garnaut (1994) called this type of cost psychic and subjective resistance respectively. The basic gravity model includes income and distance. Over the years, there have been extensions to the model. Frankel et al (1997) have incorporated per capita in the model. These three variables form the full gravity model. Subsequently, numerous extensions have been made to the model.

We recognized that currency unions are not exogenous variable and are non-linear. However, taking logarithm of the variables and a currency

¹³ The simplest gravity that can be obtained from the expenditure model type is a situation in which there is no tariff and/or transport cost and the same proportion of income spent on tradable goods by all countries is the same.

¹⁴ His gravity equation is known as the generalized gravity model in that it also included price terms.

union dummy as a proxy for volatility in the exchange rate will allow us to apply OLS estimation method. This argument is in line with Baldwin et al. (2005) in that the effect of exchange rate uncertainty on trade has non-linear features, which implies that currency union should have an effect when the exchange rate volatility is equal to zero. Hence, marginal increase in trade gets larger as volatility declines towards zero.

The impact of a currency union on trade is estimated through two approaches. First, we use the traditional gravity model to investigate the impact of a currency union on trade. Since international trade is affected by many factors apart from cost relating to exchange rate uncertainty, the gravity model accounts for these factors. In a traditional gravity model, trade is affected positively by country size but negatively by distance. We followed Rose et al. and added additional variables, which include product of per capita income, whether the countries have a common language, a common border, a common colonizer or belong to a common regional FTA. We added an instability index variable, which we have not come across in any expanded gravity model. The justification is that the zone is prone to instability because of military coups as well as civil, religious, and tribal strife. In addition, a dummy variable, which is one if the two countries are in a monetary union and zero if otherwise, is included. In such a setting, the value will be one if the two countries are members of the WAMZ zone and zero if otherwise. In addition to WAMZ members, two of the observers (Cape Verde and Liberia) and two current WAEMU members (Guinea-Bissau and Senegal) have been added. These two countries have been chosen because they share a lot in common with WAMZ members. The traditional and augmented gravity model is given respectively as

$$\begin{aligned} \ln(\tau_{ij}/GDP_i) = & \alpha_0 + \alpha_1 \ln D_{ij} + \alpha_2 \ln Area_1 + \alpha_3 \ln Pop_1 \\ & + \alpha_4 \ln Area_2 + \alpha_5 \ln Pop_2 + e_{ij} \end{aligned} \quad (1)$$

whereas

τ_{ij} is bilateral trade between countries i and j (measured as export flows),

D_{ij} is the distance between them,

Area is the area measured in square kilometers

Pop is the total population

$$\begin{aligned} \ln(X_{ijt}) = & \beta_0 + \beta_1 \ln(Y_i Y_j)_t + \beta_2 \ln(Y_i Y_j / \text{Pop}_i \text{Pop}_j)_t \\ & + \beta_3 \ln D_{ij} + \beta_4 \text{Lang}_{ij} + \beta_5 \text{Border}_{ij} + \beta_6 \text{FTA}_{ijt} \\ & + \beta_7 \ln(\text{Area}_i \text{Area}_j) + \beta_8 \text{ComCol}_{ij} + \beta_9 \text{InStab}_{ijt} + \gamma \text{CU}_{ijt} + \varepsilon_{ijt} \end{aligned} \quad (2)$$

where i and j denotes countries, t denotes time, and the variables are defined as:

X_{ijt} denotes the average value of bilateral trade between i and j percent of i 's GDP at time t

Y is real GDP

Pop is population

D is the distance between i and j

Lang is a binary variable, which is unity if i and j have a common language

Border is a binary variable, which is unity if i and j share a border

FTA is a binary variable, which is unity if i and j belong to the same regional trade agreement

Area is the area of the country in square kilometers

ComCol is a binary variable, which is unity if i and j belong to the same colony

InStab represents the stability index associated with country i and j at time t

CU is a binary variable, which is unity if i and j use the same currency at time t

ε_{ij} represents the residuals; other factors that influence bilateral exports

Second, the Anderson and Van Wincoop (2001) model is employed through a linear combination of the controls. They derived a simple theoretical model that estimates the impact of a currency union on trade

flows and can be applied to countries that are in a monetary union. This method, therefore, serves as a tool for answering the question: What is the potential benefit that WAMZ brings to its members via trade? It also provides some insights into the welfare implications of a currency union. We followed Rose and Van Wincoop (2001) to estimate the potential impact of a currency union (WAMZ) on trade flows. Following Anderson and Van Wincoop (2001) in assuming constant elasticity of substitution (CES), the Anderson and Van Wincoop gravity model is given as:

$$x_{ij} = \frac{y_i y_j}{y^w} \left(\frac{t_{ij}}{P_i P_j} \right)^{1-\sigma} \quad (3)$$

Whereas; x_{ij} is the nominal value of exports from i and j , y_i is the nominal GDP of country i , y^w is the nominal value of world output, σ is the elasticity of substitution between the countries' goods, t_{ij} is the gross price markup due to trade costs, and P_i is i 's "multilateral trade resistance," a price index that depends positively on trade barriers between i and all of its trading partners not just j .

We followed Rose and Van Wincoop (2001) and estimated the Anderson and Van Wincoop using a linear combination of controls in equation 2 instead of area and gross domestic product controls for the bilateral trade barrier t_{ij} . Following Rose and Van Wincoop (2001), we estimated the model with country-fixed effects in place of the multilateral resistance terms. Nine countries with complete bilateral trade data from 1980 to 2014 was used to show the impact of currency unions on multilateral resistance and trade.

From the model above, bilateral trade between two countries in a monetary union depends on their bilateral trade barrier relative to the average barrier with other trading partners. The theory stems from the fact that each country produces a certain quantity of goods that have to be sold. Consequently, fewer barriers to trade imply more exports and imports or greater trade between one region and another. The implication is that as countries form a monetary union, trade barriers are

minimized since part of the barriers is due to national money.¹⁵ In addition, as countries enter into a monetary union, the cost associated with currency exchange is eliminated and this reduces the multilateral resistance of the country with other members of the union. The implication is that the ratio of trade cost to multilateral resistance falls and thus cushions the impact of the currency union on trade as compared to the traditional gravity model that neglects multilateral resistances. Nevertheless, a currency union still has an impact on trade.¹⁶

4. Empirical Results

4.1. Gravity Results

The equation results for traditional bilateral trade are contained in Table 1. The column shows the estimated coefficients and standard errors on variables of the minimal specification of the bilateral trade equation. The results have the expected signs. Distance has a large negative impact on bilateral trade flows. The elasticity of bilateral trade with respect to distance is less than 1 (in absolute value).

The OLS results with different specifications of the gravity model are contained in Table 2. All the specifications include standard gravity model regressors, and controls for common language, common border, common colonizer, and membership of a free trade association. The variable of interest is the coefficient on the dummy variable, which is unity if the two countries belong to a common currency area. The panel data set consisted of observations from almost 2,388 country-pair observations about 9 countries from 1980-2014. The standard errors reported (in parentheses) are robust.

The specification of the model in Table 2 fits the data well. The coefficient of determination is above 41 percent, which explains the variation in the data. The coefficients for the traditional gravity regressors are highly and statistically significant. The coefficient on long distance is negative 0.98 indicating that trade between a pair of countries

¹⁵ See Anderson and Van Wincoop (2001)

¹⁶ Rose and Van Wincoop (2001) used the two methods. The traditional method (without multilateral resistance) and the one developed by Anderson and Van Wincoop but the second method still reveals a large positive effect of currency union on trade.

falls by almost one percent for every one percent increase in the distance between them. The coefficient on size (log product of real GDP) is positive 0.001 and statistically insignificant. The coefficients for the common border and common colonizer have negative and positive signs respectively. While common colonizer is statistically significant, common border is not statistically significant. However, when distance is not included in the specification, the common border coefficient is positive and statistically significant. In the same token, the common colonizer is positive and marginally significant when common language is not included in the regression. The last two columns of Table 2 contain the results. The coefficient of the log product of real GDP is positive and statistically significant. The coefficient of the log product of population is positive. The coefficient is positive and statistically significant, which indicates that rich countries trade proportionately more than poor countries.

When countries belong to the same free trade agreement, trade increases roughly by more than tenfold in two specifications. When the instability index for country i and country j are included in the regression, it has a negative sign and is statistically significant. The implication is that the instability index for a country has an adverse effect on trade. The instability index impact on bilateral trade flow is found in Column 3 of Table 2. The instability index does not only have a negative sign, it also increases the coefficient of the currency union dummy. The main theme of the section is the currency union coefficient, which is estimated at around 1.48. The point estimates of the currency union effect indicate that two countries that use the same currency trade more. The estimated $\exp(1.48)$, which is approximately equal to 4.40, the estimate without country-fixed effects indicates that currency union is in line with trade increase of about more than 439 per cent (similar to the estimate in Rose et al. (2001)). The effect is not only statistically significant but also economically too. The robust t -statistics is 4.70, despite the presence of eight other controls. Adding the country effect reduces both economic and statistical impact of the currency union effect but it remains significant.

To address the issue of home bias and reduce or eliminate it, we included other measures that are shared not only within a country but with other countries as well. Consequently, we followed earlier researchers and incorporated variables such as common language,

common colonizer, etc. These additional variables are positive but are not all statistically significant in all specifications. Contrary to earlier research, the FTA dummy is negative in some specifications.

Several robustness checks were performed to strengthen our assessment. First, on stability diagnostics of the estimated coefficients in the estimated models using the tests of Brown et al. (1975), known as the cumulative sum (CUSUM) and the cumulative sum of squares (CUSUMSQ). The results are presented in Appendix B, figure B1. As seen from the figures, all most all the plots of statistics CUSUMSQ are inside the critical bound at 5 percent level of significance, which entails that all the coefficients are constant. Second, Wald test was performed on the variables in the model. The test indicated that all coefficients are significantly different from zero and the residuals look well behaved with a mean around zero as shown in Appendix B, figure B2.

4.2. The Potential WAMZ Impact on Trade

To estimate the potential WAMZ impact on trade, we employed the Anderson and Van Wincoop (2001) model (see equation 3).¹⁷ We followed Rose and Van Wincoop (2001) by using a linear combination of the controls in Table 2 (other than area and the GDP controls) for the bilateral trade barrier. We estimated the model with country-fixed effects in place of the country-specific multilateral resistance terms. Annual data from 1980-2014 is used for a set of nine countries for which we have complete bilateral data, which allows us to determine the impact of a currency union on trade flows. Even though the currency union coefficient decreases, it remains large. The coefficient estimate is 1.28; the robust t-statistic is 4.28. Therefore, the potential WAMZ impact on trade flows is $\exp(1.28)$ which is approximately 3.60. In other words, bilateral trade will increase about 366 percent when the zone enters into a monetary union. When the instability index for country i and country j are included in the Anderson and Van Wincoop (2001) model, the coefficient has a negative sign and is statistically significant. When the product of the two countries' instability indexes is included in the gravity model, the respective coefficients show a negative sign and are statistically significant.

¹⁷ See Anderson and van Wincoop (1979) for the theoretical gravity equation

From the theory, the estimate is equivalent to $[(\sigma - 1) \ln m]$, whereby $(m - 1)$ is the tariff equivalent of the national monetary barrier. We followed Rose and Van Wincoop (2001) and use David Hummels's (2000) estimate of $\sigma = 5$, the tariff equivalent of the monetary barrier to trade is estimated to be 34 percent. The estimate is slightly higher than the findings by Rose and Van Wincoop (2001).¹⁸ The currency union, which is estimated to increase bilateral trade by 366 percent, does not take into account multilateral trade resistance. The intuition is that there is a negligible amount of trade within the zone. Bilateral trade in the zone is relatively low. In order to estimate the effect of a currency union precisely, there is a need to incorporate the multilateral trade resistance effect. The effect is taken into account in Table 3 for the potential WAMZ zone and the likely adherents. The Anderson and Van Wincoop (2001) equation permits us to estimate the impact of a currency union on any potential country that has already entered or on the verge of entering into a monetary union. Following Rose and Van Wincoop (2001) and assuming that the reduction in bilateral trade barriers for union members has been the same, the average percentage change in trade among WAMZ member countries together with their standard error is tabulated in the first column. The corresponding welfare effect is shown in the second column of Table 3 along with the standard error.

By comparison, the effects of a currency union were larger in Table 2 than in Table 3. Instead of WAMZ causing trade to increase by 439 percent or 366 percent in the WAMZ zone, trade is estimated to increase by 22.8 per cent within the zone. The multilateral effect dampens the currency union effect on trade. Although relatively low, the effect is large considering the low level of bilateral trade within the zone. A potential early adherent such as Cape Verde (observer at the moment) will not post any adverse effect by joining the zone although her entry according to the permutation will reduce the trade increase from 22.8 percent to 21.88 percent¹⁹. Our results concurred with that of Rose and Baldwin et al. (2005) that currency union positively impact trade. In addition, taking into account the small size of countries in WAMZ, the impact of the union will be greater than when the countries are larger. Hence our estimate is in line with Frankel (2008) that the magnitude of

¹⁸ They found the tariff equivalent of the monetary barrier to trade as 26 percent.

¹⁹ See Rose and van Wincoop (2001)

currency union impact on trade is larger with smaller countries. On the one hand, our results indicates that trade in WAMZ will increased by more than 300 percent, on the other hand, trade will increase by at most 22.8 percent when multilateral resistance effect is taken into account. The conclusion is that in either of these methods, trade will increased.

5. Summary and Conclusions

In this study, we examined the effect of currency union on trade in WAMZ countries. We applied traditional and modified gravity models. The results revealed that currency union have a positive impact on trade in all specifications. The estimate results without country fixed effect revealed that currency union increased trade by more than 300 percent despite the presence of other controls variables. Our results is in line with findings by Rose et. al (2001). Furthermore, the results from the traditional gravity model are in line with economic theory that larger population size and large income positively affect trade. The coefficient for distance is negative suggesting that the greater the distance between two countries the lower the trade. Interestingly, the finding revealed that the coefficient for free-trade agreement (FTA) is negative and statistically significant. This is contrary to earlier findings and not in line with economic theory. This finding however offered an insight in that FTA should not be view as a prerequisite for the formation of monetary zone.

To estimate precisely the effect of currency union on trade, we incorporated the multilateral trade resistance and applied Anderson and Van Wincoop (2001) model. This offered us the opportunity to estimate trade effect for potential currency unions. The results revealed that trade is increased by 22 percent for WAMZ members. Potential joiners such as Cape Verde and Guinea-Bissau will enhance trade by 21.88 and 21.51 percent respectively. The intuition is that once countries formed a monetary union, other countries can join the union as well on a gradual basis without an adverse effect on trade. The findings offered a convincing argument for the promotion of monetary union in Africa taking into account its impact on trade, which is engine for economic growth.

Individual country currency can be a barrier to trade. Our empirical findings revealed that individual currency cause trade to decline by 34

percent though higher than Rose and Van Wincoop (2001) estimate. Hence, African countries and other countries need take advantage of monetary integration rather than safeguarding their individual national currencies.

For WAMZ to reap its optimal benefits there is a need to foster peace and ensure stability in the region. Hence, Economic Community of West African States (ECOWAS), African Union (AU) and regional bodies need to have peace and stability as a top priority in their agenda. In doing so, peace will continue to prevail in the region which will create the conducive environment in enhancing trade among member countries.

Authorities in the zone need to encourage and ease travels within the zone. An individual from countries within the zone should be able to travel, work and school freely in any country within zone. This can minimize language barriers, which can further enhance trade. Similarly, since the region is constantly confronted with economic shocks such as drought, affected individual members in the zone will be able to move and gain employment in less affected areas. The net effect will boost aggregate demand and enhance growth.

Since distances between countries impedes trade, gradual formation of currency union can start with countries that are much more closer and expand thereafter but take into account the Optimum Currency Area (OCA) criteria. Member countries should continue to strive for sustainable economic growth and fiscal discipline for the monetary union to be sustainable and beneficial for all members.

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Table 1: The Bilateral trade equation

Dependent variable : Trade	
Variable	
Constant	-0.537*** (0.66)
Ln Distance	-0.88*** (0.06)
Ln Population (country i)	1.02*** (0.08)
Ln Area (country i)	-0.22** (0.08)
Ln Population (country j)	0.73*** (0.08)
Ln Area (country j)	0.05 (0.07)
Sample size	2388
R^2	0.40

The dependent variable is trade share. The coefficients of the variables are listed and standard errors are in parentheses.

*** 1% significance level, ** 5 % significance level, and * 10 % significance level

Table 2: The Effect of Currency Union on Trade using Gravity Model

Dependent Variable: Trade				
Variable	1	2	3	4
Currency Union	1.48*** (0.32)	1.28*** (0.30)	1.51*** (0.30)	0.90** (0.28)
Log Distance	-0.98*** (0.07)	-0.91*** (0.07)	-1.08*** (0.07)	
Log Product Real GDP	0.001 (0.00)	0.001 (0.00)	0.001*** (0.00)	0.001** (0.000)
Common Language	0.30** (0.13)	0.29** (0.13)	0.24* (0.13)	
Common border	-0.12 (0.16)	-0.01 (0.15)	-0.34** (0.16)	
Common Colonizer	0.16* (0.15)	0.21* (0.14)	0.28** (0.14)	0.23** (0.22)
Common FTA	-4.10*** (0.78)	-3.42*** (0.70)	1.12 (0.92)	-3.67*** (0.71)
Log Product Population	0.89*** (0.07)		0.64*** (0.03)	0.56*** (0.02)
Log Area	-0.12** (0.30)		0.001*** (0.001)	
Stability			-0.19*** (0.04)	
R^2	0.41	0.41	0.41	0.33
RMSE	0.77	0.77	0.77	0.82
No. Observation	2387	2387	2387	12387

The dependent variable is trade share. The coefficients of the variables are listed and standard errors are in parentheses.

*** 1% significance level, ** 5 % significance level, and * 10 % significance level

Table 3: Impact of Currency Union on Trade using the Anderson and van Wincoop (2001) Model

Union	Trade (Percentage increase)
WAMZ	22.8 (0.59)
WAMZ + Cape verde	21.88 (0.57)
WAMZ + Guinea-Bissau	21.51 (0.33)
WAMZ + Senegal	13.79 (2.35)
WAMZ + the three*	15.15 (2.02)

Note: Standard errors are reported in parenthesis

* consist of Cape Verde, Guinea-Bissau and Senegal put together with WAMZ

APPENDIX A: TABLES**Table A1:** Augmented Dicky-Fuller Unit Root Test 1/ 2 / 3 /

Dependent Variable: Bilateral trade		
Variable	Level	1st difference
Trade	0.000	Not needed
Real GDP	0.000	Not needed
Population	0.000	Not needed
Area	0.000	Not needed
Distance	0.000	Not needed

1/ All variables are in natural logarithm.

2/ P-values are reported for the Null hypothesis: Ho: series have a unit root.

3/ All tests include intercept and the number of lags is based on Schwartz Information Criterion.

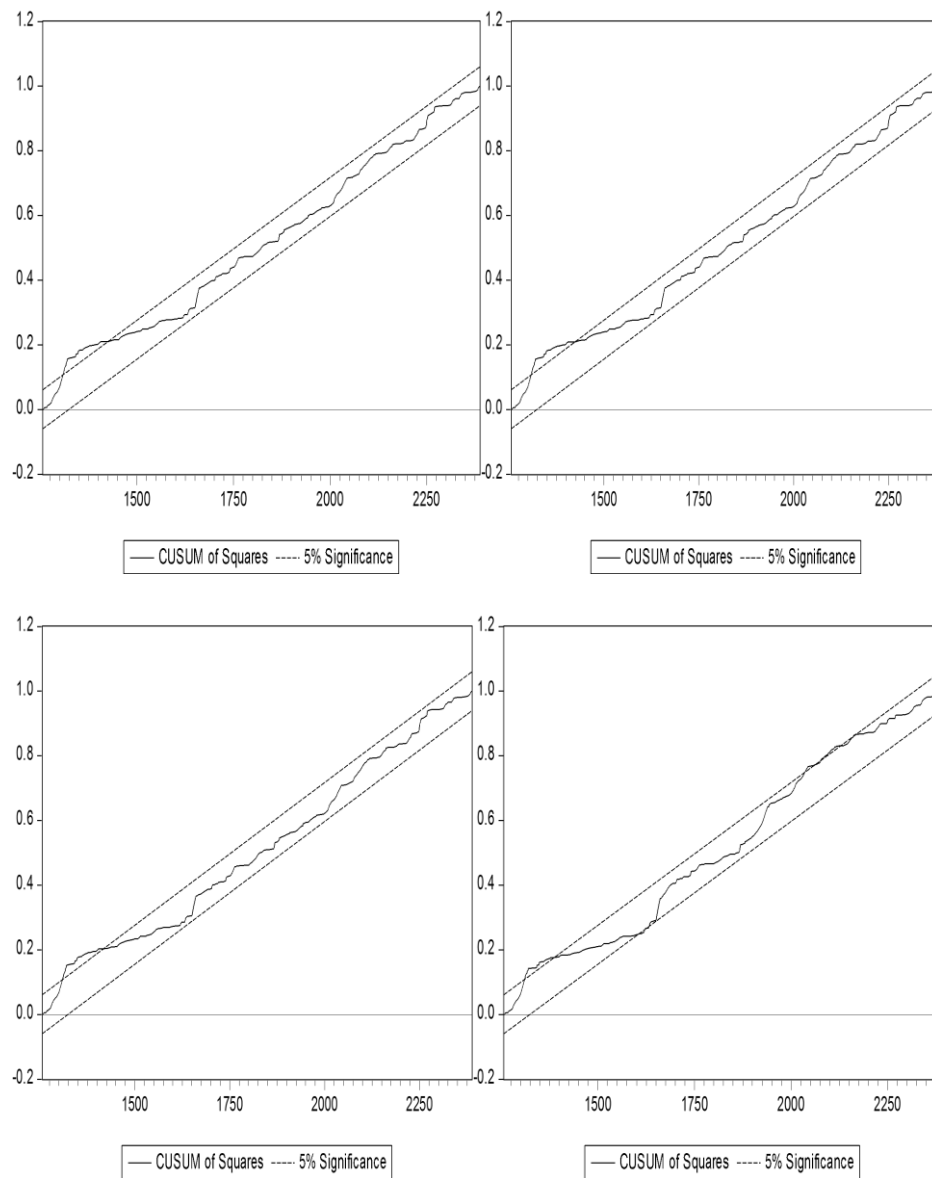
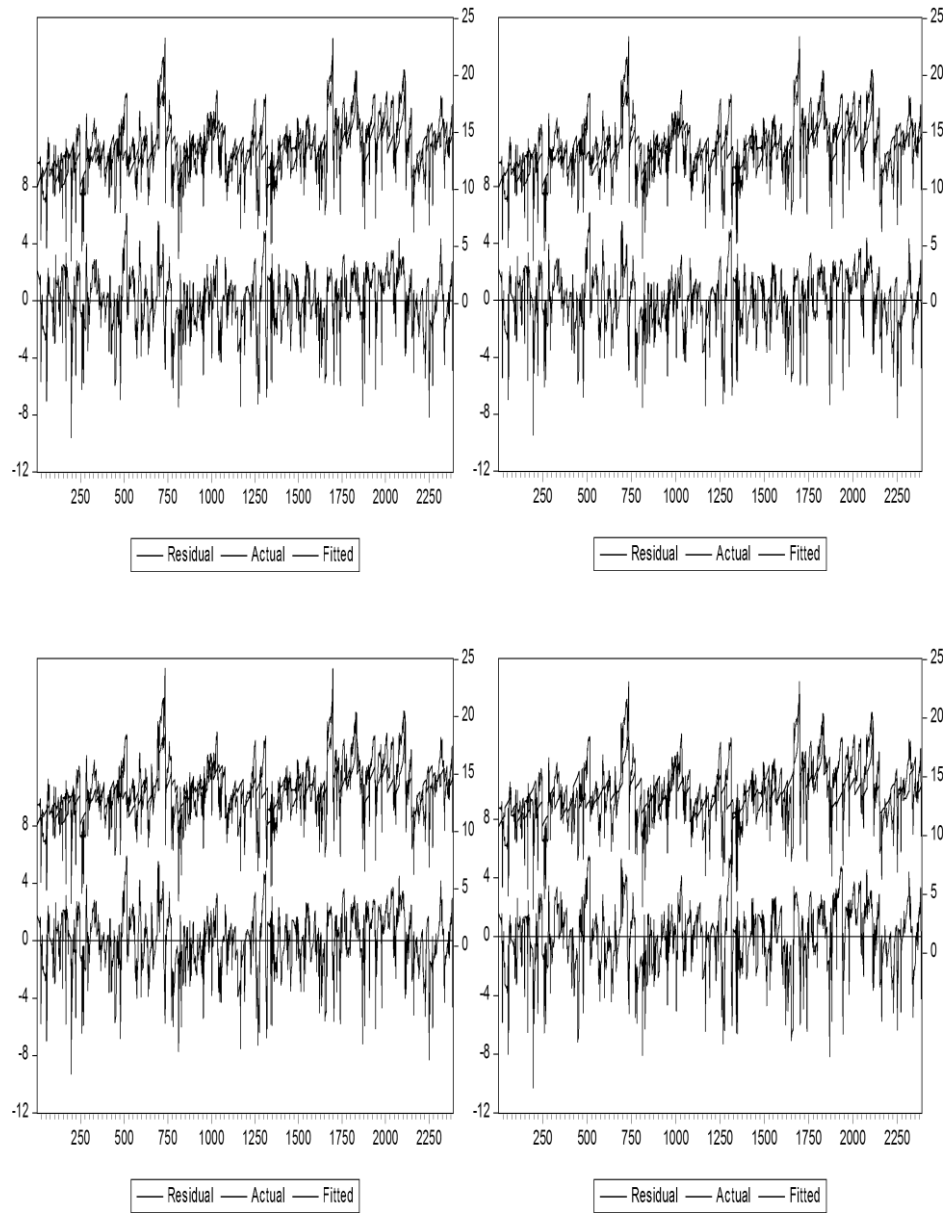
APPENDIX B**Figure B1: Cumulative Sum Squares**

Figure B2: OLS Regressions and Residuals and Fitted Values

The Optimal Choice of Exchange Rate Regime for Jordanian Dinar

Usama R. Alqalawi¹, Hail A. Jemel² and Ahmad A. Alwaked³

Jordan adopted various foreign exchange rate systems ranging from floating to different pegging regimes. The aim of this study is to evaluate the effect of using different pegging exchange rate regimes on the stability of the JD exchange rate.

This study found that pegging to the IMF Special Drawing Rights was the best choice. This is so because this alternative would lead to more stability of the JD and local prices compared to other alternatives.

Keywords: Exchange rate; Pegged exchange rates; Fixed exchange-rate

JEL classification: F31; O24

1. Introduction

Shortly after Bretton-Woods System of adjustable fixed exchange rate fall down, on 15 August 1971, many exchange regimes spread in the developing countries. Some tended to peg the domestic currency to the SDR, or to a basket of currencies of major trading partners. Other countries adopted a form of partial or administrated floating exchange rate system. The decision of selecting a certain exchange rate system is affected by openness level, diversification, and availability of international reserves. The concern of a country was to stabilize its currency exchange rate against currencies of its major trading partners for the purpose of creating stability in domestic prices.

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Choosing the appropriate exchange rate system has become a vital issue for Jordanian economy, considering the increasing number of countries integrated into the international money market at the present time. Initially, choosing the exchange rate regime was based on the criteria of the Optimum Currency Area (OCA). And whether to adopt a fixed or a flexible exchange rate depends on factor mobility (Mundell, 1961), economic openness (McKinnon, 1963), economic diversification (Kenen, 1969), and cost/benefit (Woods, 1973).

More recently, Stockman (1999), Yagci (2001), and Hammond and Rummel (2005) indicate that choosing an exchange rate system depends on various considerations, including: size of the economy, openness, production diversification, deviation of inflation from the level of inflation of main trading partners, labor and capital mobility, shocks, and flexibility of the financial policy.

This study attempts to find out the best exchange rate pegging regime for the JD in order to create stability against currencies of its major trading partners, ensure stability in the domestic prices level, protect against the rise of the cost of imports, and minimize the Jordanian foreign debt.

This paper is organized as follows: in Section 2, gives a brief overview of different considerations in selecting the exchange rate system. In Section 3, we present the different pegging regimes and their advantages and disadvantages. In Section 4, we discuss the optimal exchange rate system for the JD. Section 5 describes the data and the used methodology. Section 6 concludes the paper.

2. Considerations in selecting the exchange rate system

Typically, choosing the exchange rate system is influenced by macroeconomic conditions of each country and nature of the shocks to which it is exposed. Domestic shocks require an exchange rate system different from the external one.

Countries are advised to adopt a fixed exchange rate system to ensure greater stability in the domestic price levels if its economy is characterized by being small, open with less diversified production and exports structure and more dependent on foreign trade. The fixed

exchange rate is considered a more attractive option for countries with a small variation in the inflation rate and development scale, compared to their trading partners. According to Mundell (1961) this alternative is appropriate when there is a high degree of labor mobility. On the other hand, a large economy that is less open, and more diversified in production and exports structure with capital mobility is advised to adopt flexible exchange rates (IMF, World Economic Outlook, 1997). The IMF's annual report on (2000) indicates that pegging to a single currency system is not the best choice for all the countries under all conditions, and flexible exchange rates may be more suitable under globalization. Taking this in mind, many emerging market countries adopted flexible exchange rate systems for better adjustment to economic conditions, inflation, and objects of the monetary policy (IMF, Annual Report, 2000). Few economies with a large volume of trade adopt fixed exchange rate (Rose, 2011). In addition, pegging exchange rates offered slight advantages to emerging markets in terms of either inflation or growth performance, since such systems are associated with a larger probability of currency and financial disorders (Ghosh and Ostry, 2009).

The credibility of the national currency and national economy in general, may affect choosing an exchange rate regime. A currency pegging mechanism has been used to decelerate inflation rates in a number of countries that experienced high inflation rates during the period 1970-1980 (Bordo, 2003).

Developing countries tend to adopt managed float more than independent float. Developing countries are not interested in having their currencies freely volatile like currencies of the industrial countries. Financial markets in the developing countries are underdeveloped, their exchange markets are usually weak and their currencies are unfavorably positioned compared with the industrial countries.

Countries with greater financial openness may adopt floating regimes. In addition, highly dollarized countries are more likely to adopt fixed regimes due to an undesirable impact of sharp devaluation or unstable exchange rates (Calderón and Hebbel, 2008).

3. Pegging strategies:

A country that decides to peg its currency wonders which pegging strategy it should follow; i.e. pegging to a single currency, the SDR or a basket of currencies, and what advantages, disadvantages, and cost associated with each strategy. The following discussion addresses these queries.

1- Pegging to a single currency refers to pegging national currency with a major single currency like US Dollar or Euro. It is characterized as being simple and easy to apply. It only requires the central bank to announce anchoring its currency with a major currency that is usually one of its trading partners. The objective is to reduce fluctuations in the exchange rate of the two currencies, and to remove the risks associated with foreign exchange rate faced by traders and investors, while in the same time increase credibility with the national currency (Crockett and Nsouli, 1977).

The disadvantage related to this strategy is that the national monetary authority needs a great amount of reserves in the Central Bank to keep exchange rate at a fixed level. Such reserves are used to intervene in the foreign exchange market to stabilize the exchange rate (Cruz-Rodriguez, 2013). Studies report that pegging would restrict a free use of the economic policy since applying pegging system has been accompanied with financial, monetary, and debt crises (Ghosh and Ostry, 2009).

2- Pegging to SDR: The SDR value is defined based on a basket of currencies currently includes the US Dollar, Euro, Pound Sterling and the Japanese Yen. Some developing countries adopted this pegging regime since mid-70's of the last century. Such strategy creates greater stability to their national currencies due to the stability of the SDR components. The increase in the value of one component currency is counter balanced by a decrease in the value of another, with a final effect of balanced or stable total value of SDR (Coats, 1982). Some authors argue that pegging to the SDR was characterized by less volatility in real exchange rates in comparison with pegging to a single currency as the US Dollar or the Sterling Pound (Lipschitz, 1979).

This strategy is criticized by the fact that SDR components and value are uncontrollable by the pegging country but by the IMF that determines its

value on a daily basis. In addition, the country may not use SDR as a reserve for intervention and settlement of international transactions unless it is converted into an international currency. Also the US Dollar still weighs significantly. It accounts for approximately 40% of the SDR (Ali, 1985), implying greater volatility in the dollar value and a currency pegged to it.

3. Pegging to a basket: Some countries attach their currencies with a basket of the currencies of their respective main trading partners. The basket components are freely chosen by a country and controlled by its central bank so as to reach real exchange rates that are described as the appropriate rates against currencies of the main trading partners (Crockett, 1977). A number of developing countries chose a regime of pegging to a weighted basket of currencies based on one of the following bases (IMF, Annual Report, 1983; Crockett and Nsouli, 1977):

- a. The import-weight index is the exchange rates of a country's currency calculated using the relative weighted mean of other currencies by respective share of each trading partner in its imports.
- b. The export-weight index is the exchange rates of the currency against a weighted mean of other currencies by respective share of each foreign partner in its total exports.
- c. the bilateral-weight index is exchange rates of national currency relative to foreign currencies, against a baseline period weighted by the respective share of each trading partner in the aggregate imports and exports of a developing country.

A significant problem in the policy of linking the JD with the US Dollar is that a variation in US Dollar rate will totally affect the value of the JD. A reduction in JD value resulting from low US Dollar rate will result in higher inflation rates, and a significantly great reduction may substantially affect the living cost with major social consequences of worsening the poverty problem. The direct implication of linking the JD with the US Dollar is that the JD value will be fixed against the US Dollar, not the other foreign currencies.

4. Data and Methodology

This section is primarily about analyzing the variation in real exchange rate during 1995-2014. The used data were collected from the IMF and Jordan Central Bank. The purpose of this section is to quantify the amount of variation in the JD real exchange rate calculated based on five different pegging regimes. Standard deviation and coefficient of variation methods were used to find out the best pegging exchange rate regime.

The JD exchange rate was calculated based on five different pegging regimes. First, in the case of pegging the JD to the US Dollar we calculate the JD real exchange rate based on the number of US Dollars the JD can buy using the following formula:

$$RERD_t = ER_t * \frac{P_t}{P_t^{US}}$$

where, $RERD_t$ represents the JD real exchange rate at year t, based on the number of US Dollars the JD can buy when pegging to US Dollar, ER_t represents the nominal exchange rate at time t, P_t and P_t^{US} correspond to the price level in Jordan and US consecutively at time t, all calculated using the GDP deflator. Second, in the case of pegging the JD to IMF (SDR) the exchange rates were calculated by IMF. Alternatively, this strategy suggests pegging the JD with the SDR that currently includes four major currencies: the US Dollar, Euro, the Yen and the Sterling Pound based on the assumption that the JD equals one unit of the SDR

Third, in the case of pegging the JD to a certain basket that contains currencies of key trading partners of Jordan, the real exchange rate of JD based on the number of US Dollars the JD can buy was calculated by using the following formula:

$$RERT_t = \sum_i^n \left(ER_t * \frac{P_{ti}}{P_t^{US}} * \frac{T_{ti}}{T_t} \right)$$

$$T_t = \sum_i^n T_{ti}$$

were, $RERT_t$ symbolizes the JD real exchange rate based on the number of US Dollars the JD can buy when pegging to key trading partners of Jordan, the subscript i represents one of Jordan's key trade partners, n corresponds to the number of Jordan's key trade partners included in the study, in our case $n=15$, t correspond to a certain year, ER_t represents the nominal exchange rate of i country, and it defined as the number of US Dollars one unit of i currency can buy, P_{ti} represents the price level in i , country at time t . T_{ti} stands for the amount of trade between Jordan and country i and T_t is the total trade between Jordan and all n countries.

Fourth, in the case of pegging the JD to a certain basket of currencies for key Jordanian exporting partners, the JD real exchange rates based on the number of US Dollars the JD can buy was calculated using the following formula:

$$RERX_t = \sum_i^n \left(ER_t * \frac{P_{ti}}{P_t^{US}} * \frac{X_{ti}}{X_t} \right)$$

$$X_t = \sum_i^n X_{ti}$$

were, $RERX_t$ symbolizes the JD real exchange rate based on the number of US Dollars the JD can buy when pegging to key exporting partners of Jordan, the subscript i represent one of Jordan's key exporting partners, n corresponds to number of Jordan's key export partners included in the study, in our case $n=15$, ER and P_{ti} are the same as previously defined, X_{ti} stands for the amount of export from Jordan to country i , and X_t represents the total export of Jordan to all n countries.

Fifth, in the case of pegging the JD to a certain basket of currencies for Jordan's key importing partners. The JD real exchange rate based on the number of US Dollars the JD can buy was calculated using the following formula:

$$RERM_t = \sum_i^n \left(ER_t * \frac{P_{ti}}{P_t^{US}} * \frac{M_{ti}}{M_t} \right)$$

$$M_t = \sum_i^n M_{ti}$$

were, $RERM_t$ symbolizes the JD real exchange rate based on the number of US Dollars the JD can buy when pegging to key importing partners of Jordan, the subscript i represent one of Jordan's key importing partners, n corresponds to the number of Jordan's key importing partners included in the study, in our case $n= 15$, ER_t , P_{ti} is the same as previously defined, M_{ti} stands for the amount of import from country i to Jordan, and M_t represents the total import of Jordan from all n countries to Jordan.

5. Results and Recommendations

Table (1) presents the used data that include Jordanian and US price level based on GDP deflator, the nominal exchange rate of Jordan per US Dollar, the real exchange rate of Jordan per US Dollar and the real exchange of the US Dollar per JD. These data were used to calculate the JD real exchange that is pegged to the US Dollar. The variation of the last column shows the expected fluctuation in the cost of trade and debt.

The calculation in table (1) shows an increase in the JD real exchange rate from 1.1 \$ per JD in 1995 to 1.7 \$ per JD in 2014. This implies a depreciation of bilateral real exchange rate in favor of the US. Therefore, over the period of study, Jordanians were able to buy fewer goods and services with their money from the US. The reason for this is the fact that the price level in Jordan grew faster than the price level in the US while the nominal exchange rate did not change through the period of study.

Table 1: the Exchange rate and the price level of Jordan

Year	Price Level		Exchange Rate		
	JOR	US	Nominal JD/\$	Real JD/\$	Real \$/JD
1995	58.7973	75.324	0.7004	0.8972	1.1145
1996	60.0103	76.699	0.709	0.9062	1.1035
1997	60.7498	78.012	0.709	0.9105	1.0983
1998	64.4068	78.859	0.709	0.8681	1.152
1999	64.1489	80.066	0.709	0.8849	1.13
2000	63.8844	81.887	0.709	0.9088	1.1004
2001	64.3826	83.753	0.709	0.9223	1.0843
2002	64.9757	85.039	0.709	0.9279	1.0777
2003	66.3689	86.735	0.709	0.9266	1.0793
2004	68.4167	89.12	0.709	0.9235	1.0828
2005	69.8019	91.987	0.709	0.9343	1.0703
2006	77.237	94.814	0.709	0.8703	1.149
2007	81.138	97.337	0.709	0.8505	1.1757
2008	97.2585	99.246	0.7097	0.7242	1.3809
2009	100	100	0.71	0.71	1.4085
2010	108.4122	101.222	0.71	0.6629	1.5085
2011	115.3651	103.311	0.71	0.6358	1.5728
2012	120.5573	105.166	0.71	0.6194	1.6146
2013	127.3076	106.733	0.71	0.5953	1.68
2014	131.6925	108.289	0.71	0.5838	1.7128

* The data in column 2, 3 and 4 are collected from World Development Indicators IMF.

The weights of Jordan's key trade, export and import partners were calculated yearly and are given in appendix table (I), table (II) and table (III) consecutively. A set of fifteen countries was selected for each group. All These countries were selected based on the total period of accumulated trade, export and import successively. Twenty one different countries were in these three groups. All three groups include the same nine countries: Saudi Arabia, USA, China, Iraq, India, United Arab Emirates, Egypt, Turkey, and Japan. Six countries are included in the groups of trade and export key partners. These countries are Germany, Italy, South Korea, France, United Kingdom, and Russia. In addition, six countries were included in the group of export key partners only; these countries are Indonesia, Lebanon, Israel, Kuwait, Qatar, and Malaysia.

The relative price level of Jordan key trade, export and import partners with respect to US price level were given in appendix table (IV), table

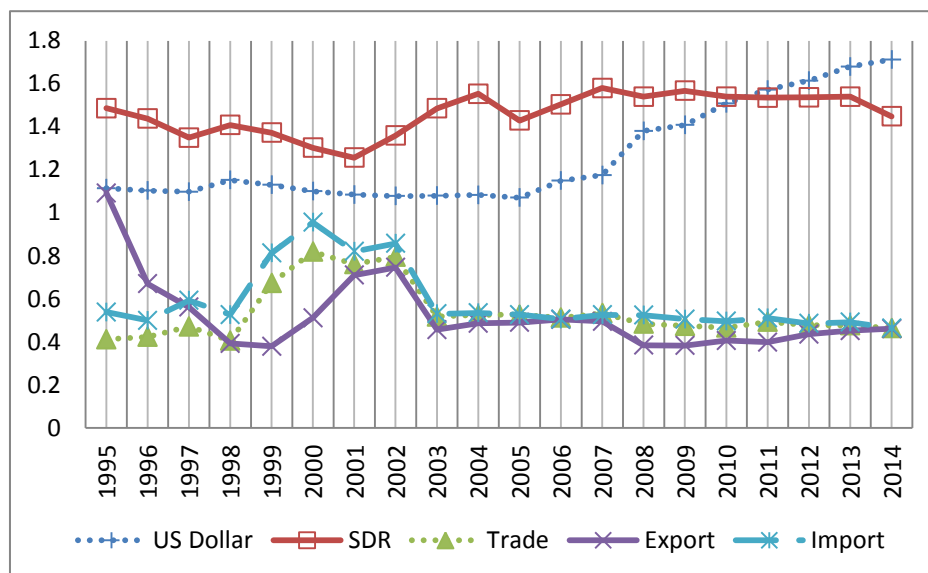
(V) and table (VI) consecutively while the nominal exchange rate per US Dollar were provided in appendix table (VII), table (VIII) and table (IX) sequentially. All these appendix tables were used to calculate table (2).

Table 2: The expected real exchange rate for Jordan (\$ per JD)

Year	Pegged to US \$*	Pegged to SDR*	Pegged to currencies of key trade partners*	Pegged to currencies of key export partners*	Pegged to currencies of key import partners*
1995	1.1145	1.4865	0.4117	1.0918	0.5385
1996	1.1035	1.438	0.423	0.6703	0.4998
1997	1.0983	1.3493	0.4712	0.5616	0.5927
1998	1.152	1.408	0.405	0.3925	0.5263
1999	1.13	1.3725	0.6734	0.3795	0.8126
2000	1.1004	1.3029	0.8188	0.5113	0.9556
2001	1.0843	1.2567	0.7616	0.7099	0.8204
2002	1.0777	1.3595	0.7948	0.7458	0.8577
2003	1.0793	1.486	0.5174	0.4567	0.5305
2004	1.0828	1.553	0.5251	0.4863	0.5349
2005	1.0703	1.4293	0.5264	0.4903	0.5265
2006	1.149	1.5044	0.5122	0.5042	0.506
2007	1.1757	1.5802	0.5328	0.4949	0.5258
2008	1.3809	1.5403	0.4844	0.3844	0.5244
2009	1.4085	1.5677	0.4746	0.3829	0.5055
2010	1.5085	1.54	0.4659	0.4056	0.496
2011	1.5728	1.5353	0.4933	0.3986	0.5109
2012	1.6146	1.5369	0.4779	0.4356	0.4852
2013	1.68	1.54	0.4769	0.4519	0.4916
2014	1.7128	1.4488	0.4641	0.4613	0.4643

• Authors calculation

Table (2) aims to find out a time series for yearly expected real exchange rate of Jordan given five different scenarios. All these five scenarios show the amount of US Dollars the JD can buy in real term. The average of the total period of the real exchange rate was very close when calculated using trade criteria. However, this is not weird since nine out of fifteen countries were included in the same three scenarios. Another remark about the real exchange rate calculated using trade criteria is that all three methods are becoming closer to each other by time as seen in graph (1).

Graph 1: The expected real exchange rate for Jordan (\$ per JD)

The variation in the real exchange rate was calculated using two methods: the standard deviation, and the coefficient of variation. Both methods showed that pegging the JD to the SDR will clearly minimize the variation in real exchange rate. When pegging to the SDR, the variation in real exchange rate using standard deviation was equal to 0.09. The next best was to peg to the currencies of key trade partners with standard deviation equal to 0.12. The worst choice was to peg to the US Dollar.

Table 3: The expected real exchange rate for Jordan (\$ per JD)

Year	Pegged to US \$	Pegged to SDR	Pegged to currencies of key trade partners	Pegged to currencies of key export partners	Pegged to currencies of key import partners
Mean	1.2648	1.4618	0.5355	0.5208	0.5853
Maximum	1.7128	1.5802	0.8188	1.0918	0.9556
Minimum	1.0703	1.2567	0.405	0.3795	0.4643
SD	0.2308	0.0943	0.1241	0.1719	0.1464
CV	0.1825	0.0645	0.2317	0.3301	0.2501

• Authors calculation

The mean value of each series was clearly different as seen in table (3). And this may reduce the accuracy of the previous results. The coefficient of variation (CV) solves this problem. The minimum variation using the coefficient of variation was found again when the JD is pegged to the SDR with a value equal to 0.06. This result is in line with Coats (1982) who found that pegging to the SDR creates greater stability in comparison with other pegging systems. The next best was when the JD is pegged to the US Dollar with a value equal to 0.18, and the worst was when the JD is pegged to the currencies of export key partners with a value equal to 0.33.

Jordan's exports are less diversified and are mainly concentrating on raw materials such as phosphate and potash, so the JD exchange rate against other currencies has no or little effect on the Jordanian exports as evaluated with the US Dollar. Jordan's imports, on the other hand, are diversified and brought in from different sources; hence they are not priced equally on the international market. A little change in the major foreign currencies against the JD can have a perceivable effect on the domestic prices of imports. In fact, the greater the number of currencies in the basket, the lesser is the effect of a single currency on the overall basket value. In addition, the increase in one currency value might be counterbalanced by a decrease in the value of another currency with a final effect being a balanced basket value. If Jordan could maintain a stable exchange rate of its currency against its main trading partners, then the benefit will be a more flourishing trade and a greater inflow of capitals (Crocket and Nsouli, 1977).

The trends of real exchange rate based on different pegging strategies are calculated in table (4). The results showed that the bilateral real exchange rate based on pegging to the US Dollar had a positive significant trend equal to 3.3% during the period of study. This confirms the previous result that the JD real exchange rate is being depreciated against the US Dollar. Similarly, the trend of exchange rate based on the SDR pegging strategy had a significant positive trend equal to 1%. However, it had a different meaning since it's not a real exchange rate. It implies that the JD exchange rate would have been appreciated during the period of study if the Jordanian government was adopting the SDR pegging strategy.

The appreciation of real exchange rate, on the other hand, would have been fulfilling too if the government adopted the other three basket pegging strategies. The results demonstrated that the real exchange rate based on pegging to a basket of key trade and import partners had a significant negative trend equal to -1.6 % and -1.1% successively. Furthermore, the real exchange rate based on pegging to a basket of key export partners had an insignificant negative trend equal to -4.1%.

Table 4: The trend of different pegging strategies (\$ per JD)

	Pegged to US \$	Pegged to SDR	Pegged to currencies of key trade partners	Pegged to currencies of key export partners	Pegged to currencies of key import partners
Constant	0.9168	1.3612	0.5788	0.6925	0.7013
	(0.0581)***	(0.0360)***	(0.0581)***	(0.0678)***	(0.0625)***
Trend	0.0331	0.0096	-0.0412	-0.01636	-0.0111
	(0.0331)***	(0.0030)***	(-0.0048)	(0.0057)***	(0.0052)**
R²	0.7216	0.3604	0.0386	0.317	0.2
F	46.6562***	10.1438***	0.7236	8.3527***	4.4933**

* 1% level of significant,

** 5% level of significant

*** 1% level of significant

6. Conclusion

This study showed that pegging to the US Dollar, the current situation, created less stability for the JD. In addition, the JD bilateral real exchange rate with the US experienced sharp depreciation with positive trend equal to 3.3% during the period of study. The JD real exchange rate was equal to 1.1\$ per JD in 1995 and reached 1.7\$ per JD in 2014. This caused a negative effect on the Jordanian economy represented by a higher cost of Jordan's imports from its trading partners, and an increased foreign debt burden.

Conversely, the basket pegging strategies, especially SDR pegging strategy, proved to be better alternatives to pegging to the US Dollar. The study demonstrated that pegging the JD to the SDR created greater

stability for the JD. Furthermore, the trend of nominal exchange rate based on the SDR pegging strategy had a significant positive trend. Similarly, the results demonstrated that the real exchange rate based on pegging to a basket of key trade, export and import partners had a negative trend. This may contribute to greater stability in the domestic prices level.

The study recommends policymakers to shift from the current exchange rate regime where the JD is pegged to the US Dollar, to the exchange rate regime of pegging the JD to the SDR. This strategy achieves greater stability to the exchange rate of the JD and the domestic prices level, while it cuts down the cost of imports and the external debt.

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Appendix

Table I: The trade weight of Jordan key trade partner = $(T_{it}/T_t^* 100)$

Year	SA	US	CN	IQ	IN	DE	IT	AE	EG	TR	KP	JP	FR	UK	RS
1995	6.1	9.6	2.7	19	6.1	8.3	5.9	2.1	1.5	4.1	3.4	3.9	4.6	4.8	17.9
1996	8.2	11.4	2.7	16.8	5	9.4	7.3	2.7	3	4.7	4.1	5.1	5.7	5.1	8.9
1997	8.3	9.6	2.9	17.3	5.2	10.6	6.3	2.5	1.4	3.1	3	5.5	3.6	4.9	15.9
1998	7.4	9.5	3	12.3	6	9.7	5.3	2.9	1.6	4.5	3.6	6.1	3.8	5.3	19
1999	8.3	10.8	4.4	15.1	9	10.5	4.9	3.5	1.8	2.6	4.9	7.1	4.1	5.3	7.6
2000	6.5	12.1	5.2	19.3	7.2	12.5	4.1	2.7	1.6	2.4	4	4.5	4.2	5.2	8.5
2001	6.2	13.4	6	23.6	5.9	10.1	3.6	3	1.5	2.9	3.1	4	4	4.2	8.4
2002	5.7	15.9	7.3	23	5.9	9.2	3.6	3.1	1.8	2.7	2.7	3.3	4.1	3.8	7.9
2003	14.9	19.5	9.1	12.8	5.3	8.6	4.2	4.4	2.6	2.8	2.8	3.9	3.5	3.8	2
2004	22.9	19.9	9.2	7.3	5	7.1	4.1	3.2	4.2	2.6	3.3	3.6	2.9	2.8	1.7
2005	27	16.9	10	5.6	4.9	8.5	3.7	3.4	4.1	2.8	3.8	3.2	2.5	3.1	0.5
2006	28.8	15.9	10.8	4.1	5	8	3.9	4	4.7	2.8	3.3	3.5	2.4	2.4	0.5
2007	25.9	15.1	11.2	4.4	6.2	8.3	3.8	3.6	5.3	3.3	3.6	3.9	2.7	2.4	0.3
2008	25.4	11.3	11.7	5.5	11.2	6.4	3.7	3.3	5.4	3	3.8	4.1	2.6	2.2	0.4
2009	21.7	13.3	11.5	7.3	7	6.4	4	3.9	6.8	3.3	4.1	4.9	2.6	2.5	0.5
2010	24.2	11.8	11.7	7.5	7.7	6.8	3.9	4.3	5.4	4.1	4.4	3.6	2.3	1.9	0.4
2011	26.7	12.4	11.4	7.3	7.9	4.8	5.8	5.2	4.8	3.6	3.6	2.3	2.1	1.8	0.5
2012	29.2	12.9	11.3	6.9	7.4	4.2	5.1	4.3	4.7	4.8	3.1	2.2	2	1.5	0.3
2013	25.2	13.1	12.2	8.2	8.2	4.3	5.5	5.1	4.2	4.4	2.9	2.7	2	1.5	0.3
2014	26.3	12.7	12.4	5.7	9.1	4.4	3.6	6.6	3.2	4.9	3.8	2.8	2.3	1.9	0.2

* Authors calculation based on data from Central Bank of Jordan

Table II.: The export weight of Jordan key export partner = (X_{ti}/X_{tr}*100)

Year	US	IQ	IN	SA	AE	LB	ID	IL	CN	KW	EG	QA	MY	TR	JP
1995	2.6	33.7	20.2	12.4	7.7	4.3	4.8	0	2.4	0.2	1.6	1.8	2.6	3.5	2.3
1996	2.5	17.4	14.8	23.5	10.8	4.4	5.7	0.8	1.7	3.6	2.5	3.2	3.5	3.3	2.2
1997	0.8	22.4	15.5	22.2	8.7	4.5	2.9	2.8	2.1	5.4	2.3	3.4	2.4	2.6	2
1998	1	18.8	20.8	18.4	10.3	5.3	3.2	4.3	2.1	4.7	2.5	3.4	2.7	0.8	1.8
1999	1.5	12.8	28.8	15.9	9.8	3.6	2.9	6	4	3.2	2.5	2.5	3.3	1.6	1.7
2000	6.6	14.8	25.5	13.6	7.1	3.6	3	8.2	4.9	2.9	2.5	2.2	2.2	1.5	1.4
2001	16.3	29.7	14.4	9.5	5.8	2.7	2.1	7.2	2.9	2.5	1.5	1.8	1.7	0.9	0.9
2002	25.5	26.1	13.4	8.8	4.7	2.9	1.2	7.3	2.7	2.1	0.9	1.6	1	1.1	0.7
2003	37.5	17.9	11.3	8.8	5.3	2.6	1.5	5.5	2	2.1	1.4	1.4	1.1	0.7	0.8
2004	41.2	20.6	10.2	7.9	4.4	2.3	1.4	4.2	1.4	2.1	1.2	0.9	0.9	0.6	0.7
2005	39.6	19	12.3	8.6	4.8	2.2	0.5	3.8	1.4	2.5	1.5	1.2	0.9	0.8	0.9
2006	38.8	14	12	11.6	7.4	2	0.7	3.7	1	2.8	1.4	1.5	1.4	0.5	1.3
2007	35.8	15.5	13.6	10.7	5.1	2.8	1.1	3.5	2.1	2.2	1.9	2	1.5	0.6	1.9
2008	21.2	16.5	26.4	9.7	4.5	2.6	2.7	2.8	2.3	1.9	2.1	1.7	1.8	0.6	3.2
2009	21.4	21.3	16.9	13.2	5.1	4.4	3.5	2.6	1	1.8	2.2	1.6	0.7	0.7	3.7
2010	20.4	20.1	17.1	14	5.6	4.3	3.3	2	2.4	1.9	2.7	2.1	1.6	1.3	1.3
2011	20	19.4	17.6	12.1	4.4	5.7	4.1	1.4	3.8	2.7	2.2	1.7	2.2	1.7	0.9
2012	21.5	19.6	13.9	14.3	4.7	4.6	5.3	1.5	3.6	2	2.3	2.2	1.3	2.5	0.8
2013	22.6	23.5	9.3	17.4	5.1	2.6	4.3	1.6	2	2.6	2.2	2.5	1.8	1.9	0.8
2014	23.3	20.8	11.5	17.8	5.1	2.4	2.2	1.5	3.3	3.1	2	2.6	1	2.9	0.6

* Authors calculation based on data from Central Bank of Jordan

Table III: The import weight of Jordan key import partner (Mti/Mtr*100)

year	SA	CN	US	DE	IT	EG	KP	TR	JP	IQ	IN	AE	FR	UK	RS
1995	5.4	3.5	14.2	12.9	8.2	1.9	4.6	5.3	5.4	18.7	2.9	0.7	7.1	7.4	1.8
1996	4.6	3.2	14.7	12	8.9	3.3	4.7	5.4	6.3	17.8	2.6	0.7	7.4	6.6	1.8
1997	5.3	3.7	14.2	15	8.8	1.3	3.5	3.8	7.6	18.8	2.8	0.9	5.2	7.2	1.8
1998	5.5	3.9	14	14.4	7.3	1.7	4.9	6.6	8.6	12.8	2.7	1.2	5.7	7.5	3.2
1999	5.9	4.6	14.3	14.1	6	1.6	6.3	3	9.2	16.3	2.3	1.4	5.6	6.9	2.4
2000	4.7	5.5	14.2	16.5	5.2	1.4	5.1	2.8	5.6	21.3	2	1.5	5.4	6.5	2.3
2001	5	7.6	12.7	14.3	5.1	1.7	4.5	3.9	5.6	21.9	2.3	1.9	5.9	5.6	1.9
2002	4.3	10	11.8	13.9	5.3	2.3	3.9	3.7	4.7	22.5	2.5	2.3	6.2	5.6	0.9
2003	17	12	10.2	11.9	5.7	3.1	3.8	3.7	5.2	9.8	2.2	3.8	4.8	5.2	1.6
2004	28.9	12.3	9.9	10	5.6	5.4	4.6	3.4	4.8	1.2	2.6	2.6	4	3.8	0.9
2005	32.7	12.8	7.7	11.1	4.6	4.8	4.9	3.4	3.9	0.4	1.9	2.8	3.3	3.9	1.8
2006	34.2	14.1	6.5	10.6	4.9	5.7	4.2	3.5	4.2	0.1	2.1	2.5	3.3	3	1.2
2007	29.4	13.5	6.5	10.6	4.6	6.1	4.4	4	4.3	0.1	3.1	2.8	3.4	2.9	4.1
2008	29.9	14.7	6.5	8.5	4.5	6.4	4.8	3.8	4.1	0.6	4.2	2.6	3.5	2.8	3.2
2009	23.4	14.7	9.3	8.3	4.8	8.1	5.2	4.1	4.9	1.5	2.8	3.1	3.3	3.1	3.3
2010	26.7	14.6	7.6	9	4.7	6.1	5.7	4.9	4.2	2	3.4	3.5	3	2.3	2.2
2011	29.3	13	8.5	6	6.8	5.3	4.3	3.9	2.6	2.2	3.6	5	2.6	2.1	5.1
2012	31.6	12.9	8.9	5.2	6	5.1	3.7	5.2	2.5	2.1	4.6	3.8	2.4	1.7	4.1
2013	26.4	15	9	5.5	6.8	4.6	3.6	5	3.2	2.3	7.3	4.8	2.5	1.8	2.2
2014	27.3	14.7	8.1	5.5	4.3	3.4	4.7	5.2	3.4	0	7.6	6.7	2.8	2.2	4.1

* Authors calculation based on data from Central Bank of Jordan

Table IV: The relative price for Jordan key trade partner (Pti/PtUS)

year	SA	US	CN	IQ	IN	DE	IT	AE	EG	TR	KP	JP	FR	UK	RS
1995	0.79	1	0.89	0.19	0.63	1.18	0.93	0.65	0.53	0.02	0.93	1.52	1.07	0.95	0.08
1996	0.83	1	0.94	0.16	0.67	1.17	0.95	0.67	0.56	0.04	0.96	1.48	1.07	0.97	0.12
1997	0.83	1	0.93	0.31	0.7	1.15	0.96	0.65	0.59	0.07	0.98	1.47	1.06	0.98	0.13
1998	0.71	1	0.9	0.26	0.75	1.15	0.98	0.62	0.6	0.13	1.01	1.45	1.06	0.98	0.15
1999	0.77	1	0.87	0.43	0.76	1.14	0.98	0.66	0.6	0.2	0.99	1.41	1.04	0.98	0.26
2000	0.85	1	0.85	0.61	0.77	1.1	0.98	0.72	0.61	0.29	0.97	1.36	1.03	0.98	0.35
2001	0.8	1	0.85	0.48	0.78	1.09	0.98	0.69	0.61	0.43	0.99	1.32	1.03	0.97	0.4
2002	0.81	1	0.84	0.5	0.79	1.09	1	0.71	0.62	0.58	1	1.28	1.04	0.98	0.46
2003	0.83	1	0.85	0.53	0.81	1.08	1.01	0.72	0.64	0.7	1.02	1.23	1.04	0.98	0.51
2004	0.9	1	0.89	0.6	0.83	1.07	1.01	0.76	0.7	0.77	1.02	1.18	1.03	0.98	0.6
2005	1.03	1	0.9	0.77	0.84	1.04	1	0.86	0.72	0.79	1	1.13	1.01	0.98	0.69
2006	1.08	1	0.92	0.88	0.87	1.01	0.99	0.93	0.75	0.84	0.97	1.08	1	0.98	0.77
2007	1.1	1	0.94	0.99	0.89	1	0.98	1.02	0.82	0.87	0.96	1.05	1	0.98	0.85
2008	1.24	1	1	1.28	0.95	0.99	0.99	1.19	0.91	0.96	0.97	1.01	1.01	0.99	0.99
2009	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2010	1.16	1	1.03	1.16	1.08	1	0.99	1.1	1.09	1.04	1.02	0.97	1	1.02	1.13
2011	1.31	1	1.09	1.38	1.12	0.99	0.99	1.24	1.19	1.11	1.01	0.93	0.99	1.02	1.28
2012	1.34	1	1.11	1.41	1.19	0.98	0.98	1.25	1.31	1.17	1.01	0.9	0.98	1.02	1.35
2013	1.3	1	1.12	1.37	1.24	0.99	0.98	1.27	1.41	1.22	1	0.89	0.98	1.02	1.4
2014	1.25	1	1.12	1.37	1.27	0.99	0.97	1.2	1.55	1.32	1	0.89	0.97	1.02	1.47

* Authors calculation based on data from World Development Indicators

Table V: The relative price for Jordan key Export partner (Pti/PtUS)

year	US	IQ	IN	SA	AE	LB	ID	IL	CN	KW	EG	QA	MY	TR	JP
1995	1	0.19	0.63	0.79	0.65	0.84	0.17	0.83	0.89	0.63	0.53	0.54	0.76	0.02	1.52
1996	1	0.16	0.67	0.83	0.67	0.89	0.19	0.9	0.94	0.71	0.56	0.57	0.78	0.04	1.48
1997	1	0.31	0.7	0.83	0.65	1	0.21	0.96	0.93	0.66	0.59	0.54	0.79	0.07	1.47
1998	1	0.26	0.75	0.71	0.62	1.03	0.36	1.01	0.9	0.54	0.6	0.43	0.85	0.13	1.45
1999	1	0.43	0.76	0.77	0.66	1.03	0.4	1.06	0.87	0.63	0.6	0.49	0.84	0.2	1.41
2000	1	0.61	0.77	0.85	0.72	0.98	0.47	1.06	0.85	0.75	0.61	0.64	0.89	0.29	1.36
2001	1	0.48	0.78	0.8	0.69	0.94	0.53	1.05	0.85	0.67	0.61	0.6	0.86	0.43	1.32
2002	1	0.5	0.79	0.81	0.71	0.98	0.55	1.08	0.84	0.69	0.62	0.61	0.87	0.58	1.28
2003	1	0.53	0.81	0.83	0.72	0.97	0.57	1.05	0.85	0.71	0.64	0.7	0.88	0.7	1.23
2004	1	0.6	0.83	0.9	0.76	0.92	0.6	1.03	0.89	0.77	0.7	0.77	0.91	0.77	1.18
2005	1	0.77	0.84	1.03	0.86	0.88	0.67	1.01	0.9	0.91	0.72	0.97	0.96	0.79	1.13
2006	1	0.88	0.87	1.08	0.93	0.86	0.74	0.99	0.92	1.03	0.75	1.02	0.97	0.84	1.08
2007	1	0.99	0.89	1.1	1.02	0.86	0.8	0.97	0.94	1.05	0.82	1.1	0.99	0.87	1.05
2008	1	1.28	0.95	1.24	1.19	0.91	0.93	0.97	1	1.22	0.91	1.33	1.07	0.96	1.01
2009	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2010	1	1.16	1.08	1.16	1.1	0.99	1.14	1	1.03	1.1	1.09	1.08	1.03	1.04	0.97
2011	1	1.38	1.12	1.31	1.24	1	1.2	1	1.09	1.26	1.19	1.26	1.06	1.11	0.93
2012	1	1.41	1.19	1.34	1.25	1.04	1.22	1.02	1.11	1.33	1.31	1.32	1.05	1.17	0.9
2013	1	1.37	1.24	1.3	1.27	1.04	1.26	1.03	1.12	1.32	1.41	1.31	1.04	1.22	0.89
2014	1	1.37	1.27	1.25	1.2	1.04	1.31	1.03	1.12	1.26	1.55	1.27	1.05	1.32	0.89

* Authors calculation based on data from World Development Indicators

Table VI: The relative price for Jordan key import partner (Pti/PtUS)

year	SA	CN	US	DE	IT	EG	KP	TR	JP	IQ	IN	AE	FR	UK	RS
1995	1.27	1.12	1	0.85	1.08	1.87	1.07	41.95	0.66	5.26	1.58	1.55	0.93	1.05	12.33
1996	1.21	1.07	1	0.86	1.05	1.78	1.04	24.02	0.67	6.12	1.5	1.49	0.94	1.03	8.61
1997	1.2	1.08	1	0.87	1.04	1.71	1.02	13.46	0.68	3.25	1.43	1.53	0.95	1.02	7.61
1998	1.41	1.11	1	0.87	1.02	1.66	0.99	7.74	0.69	3.91	1.34	1.62	0.95	1.02	6.49
1999	1.29	1.15	1	0.88	1.02	1.67	1.01	5.1	0.71	2.32	1.31	1.51	0.96	1.02	3.82
2000	1.18	1.18	1	0.91	1.02	1.63	1.03	3.5	0.73	1.65	1.3	1.38	0.97	1.02	2.84
2001	1.25	1.18	1	0.92	1.02	1.64	1.01	2.34	0.76	2.1	1.29	1.45	0.97	1.03	2.49
2002	1.23	1.19	1	0.92	1	1.62	1	1.73	0.78	2	1.26	1.42	0.96	1.02	2.19
2003	1.2	1.17	1	0.93	0.99	1.55	0.98	1.43	0.81	1.89	1.24	1.39	0.97	1.02	1.96
2004	1.12	1.13	1	0.94	0.99	1.43	0.98	1.31	0.85	1.66	1.21	1.32	0.98	1.02	1.68
2005	0.97	1.11	1	0.96	1	1.39	1	1.26	0.89	1.3	1.19	1.17	0.99	1.02	1.45
2006	0.92	1.09	1	0.99	1.01	1.33	1.03	1.19	0.92	1.13	1.16	1.07	1	1.02	1.3
2007	0.91	1.06	1	1	1.02	1.21	1.04	1.15	0.96	1.01	1.12	0.98	1	1.02	1.17
2008	0.8	1	1	1.01	1.01	1.1	1.03	1.05	0.99	0.78	1.05	0.84	0.99	1.01	1.01
2009	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2010	0.86	0.97	1	1	1.01	0.92	0.98	0.96	1.03	0.86	0.93	0.91	1	0.98	0.89
2011	0.76	0.92	1	1.01	1.01	0.84	0.99	0.9	1.08	0.72	0.89	0.8	1.01	0.98	0.78
2012	0.75	0.9	1	1.02	1.02	0.76	0.99	0.86	1.11	0.71	0.84	0.8	1.02	0.98	0.74
2013	0.77	0.89	1	1.01	1.02	0.71	1	0.82	1.13	0.73	0.8	0.79	1.03	0.98	0.71
2014	0.8	0.89	1	1.01	1.03	0.64	1	0.76	1.13	0.73	0.78	0.83	1.03	0.98	0.68

* Authors calculation based on data from World Development Indicators

Table VII: The nominal exchange rate for Jordan key trade partner per dollar (ERT)

year	SA	US	CN	IQ	IN	DE	IT	AE	EG	TR	KP	JP	FR	UK	RS
1995	3.8	1	8.4	0.3	32.4	1.4	1629	3.7	3.4	0	771.3	94.1	5	0.6	4.6
1996	3.8	1	8.3	0.3	35.4	1.5	1543	3.7	3.4	0.1	804.5	108.8	5.1	0.6	5.1
1997	3.8	1	8.3	0.3	36.3	1.7	1703	3.7	3.4	0.2	951.3	121	5.8	0.6	5.8
1998	3.8	1	8.3	0.3	41.3	1.8	1736	3.7	3.4	0.3	1401	130.9	5.9	0.6	9.7
1999	3.8	1	8.3	0.3	43.1	0.9	0.9	3.7	3.4	0.4	1189	113.9	0.9	0.6	24.6
2000	3.8	1	8.3	0.3	44.9	1.1	1.1	3.7	3.5	0.6	1131	107.8	1.1	0.7	28.1
2001	3.8	1	8.3	0.3	47.2	1.1	1.1	3.7	4	1.2	1291	121.5	1.1	0.7	29.2
2002	3.8	1	8.3	0.3	48.6	1.1	1.1	3.7	4.5	1.5	1251	125.4	1.1	0.7	31.3
2003	3.8	1	8.3	2134	46.6	0.9	0.9	3.7	5.9	1.5	1192	115.9	0.9	0.6	30.7
2004	3.8	1	8.3	1453	45.3	0.8	0.8	3.7	6.2	1.4	1145	108.2	0.8	0.5	28.8
2005	3.7	1	8.2	1472	44.1	0.8	0.8	3.7	5.8	1.3	1024	110.2	0.8	0.5	28.3
2006	3.7	1	8	1467	45.3	0.8	0.8	3.7	5.7	1.4	954.8	116.3	0.8	0.5	27.2
2007	3.7	1	7.6	1255	41.3	0.7	0.7	3.7	5.6	1.3	929.3	117.8	0.7	0.5	25.6
2008	3.8	1	6.9	1193	43.5	0.7	0.7	3.7	5.4	1.3	1102	103.4	0.7	0.5	24.9
2009	3.8	1	6.8	1170	48.4	0.7	0.7	3.7	5.5	1.5	1277	93.6	0.7	0.6	31.7
2010	3.8	1	6.8	1170	45.7	0.8	0.8	3.7	5.6	1.5	1156	87.8	0.8	0.6	30.4
2011	3.8	1	6.5	1170	46.7	0.7	0.7	3.7	5.9	1.7	1108	79.8	0.7	0.6	29.4
2012	3.8	1	6.3	1166	53.4	0.8	0.8	3.7	6.1	1.8	1127	79.8	0.8	0.6	30.8
2013	3.8	1	6.2	1166	58.6	0.8	0.8	3.7	6.9	1.9	1095	97.6	0.8	0.6	31.8
2014	3.8	1	6.1	1166	61	0.8	0.8	3.7	7.1	2.2	1053	105.9	0.8	0.6	38.4

* Data from database: World Development Indicators

Table VIII: The nominal exchange rate for Jordan key Export partner per dollar (ERt)

year	US	IQ	IN	SA	AE	LB	ID	IL	CN	KW	EG	QA	MY	TR	JP
1995	1	0.3	32.4	3.8	3.7	11.2	1621.4	2248.6	3	8.4	0.3	3.4	3.6	2.5	0
1996	1	0.3	35.4	3.8	3.7	11.2	1571.4	2342.3	3.2	8.3	0.3	3.4	3.6	2.5	0.1
1997	1	0.3	36.3	3.8	3.7	11.2	1539.5	2909.4	3.4	8.3	0.3	3.4	3.6	2.8	0.2
1998	1	0.3	41.3	3.8	3.7	11.2	1516.1	10014	3.8	8.3	0.3	3.4	3.6	3.9	0.3
1999	1	0.3	43.1	3.8	3.7	11.2	1507.8	7855.2	4.1	8.3	0.3	3.4	3.6	3.8	0.4
2000	1	0.3	44.9	3.8	3.7	11.2	1507.5	8421.8	4.1	8.3	0.3	3.5	3.6	3.8	0.6
2001	1	0.3	47.2	3.8	3.7	11.2	1507.5	10261	4.2	8.3	0.3	4	3.6	3.8	1.2
2002	1	0.3	48.6	3.8	3.7	11.2	1507.5	9311.2	4.7	8.3	0.3	4.5	3.6	3.8	1.5
2003	1	2133.8	46.6	3.8	3.7	11.2	1507.5	8577.1	4.6	8.3	0.3	5.9	3.6	3.8	1.5
2004	1	1453.4	45.3	3.8	3.7	11.2	1507.5	8938.9	4.5	8.3	0.3	6.2	3.6	3.8	1.4
2005	1	1472	44.1	3.7	3.7	11.2	1507.5	9704.7	4.5	8.2	0.3	5.8	3.6	3.8	1.3
2006	1	1467.4	45.3	3.7	3.7	11.2	1507.5	9159.3	4.5	8	0.3	5.7	3.6	3.7	1.4
2007	1	1254.6	41.3	3.7	3.7	11.2	1507.5	9141	4.1	7.6	0.3	5.6	3.6	3.4	1.3
2008	1	1193.1	43.5	3.8	3.7	11.2	1507.5	9699	3.6	6.9	0.3	5.4	3.6	3.3	1.3
2009	1	1170	48.4	3.8	3.7	11.2	1507.5	10390	3.9	6.8	0.3	5.5	3.6	3.5	1.5
2010	1	1170	45.7	3.8	3.7	11.2	1507.5	9090.4	3.7	6.8	0.3	5.6	3.6	3.2	1.5
2011	1	1170	46.7	3.8	3.7	11.2	1507.5	8770.4	3.6	6.5	0.3	5.9	3.6	3.1	1.7
2012	1	1166.2	53.4	3.8	3.7	11.2	1507.5	9386.6	3.9	6.3	0.3	6.1	3.6	3.1	1.8
2013	1	1166	58.6	3.8	3.7	11.2	1507.5	10461	3.6	6.2	0.3	6.9	3.6	3.2	1.9
2014	1	1166	61	3.8	3.7	11.2	1507.5	11865	3.6	6.1	0.3	7.1	3.6	3.3	2.2

* Data from database: World Development Indicators

Table IX: The nominal exchange rate for Jordan key import partner per dollar (ERt)

year	SA	CN	US	DE	IT	EG	KP	TR	JP	IQ	IN	AE	FR	UK	RS
1995	3.8	8.4	1	1.4	1628.9	3.4	771.3	0	94.1	0.3	32.4	3.7	5	0.6	4.6
1996	3.8	8.3	1	1.5	1542.9	3.4	804.5	0.1	108.8	0.3	35.4	3.7	5.1	0.6	5.1
1997	3.8	8.3	1	1.7	1703.1	3.4	951.3	0.2	121	0.3	36.3	3.7	5.8	0.6	5.8
1998	3.8	8.3	1	1.8	1736.2	3.4	1401.4	0.3	130.9	0.3	41.3	3.7	5.9	0.6	9.7
1999	3.8	8.3	1	0.9	0.9	3.4	1188.8	0.4	113.9	0.3	43.1	3.7	0.9	0.6	24.6
2000	3.8	8.3	1	1.1	1.1	3.5	1131	0.6	107.8	0.3	44.9	3.7	1.1	0.7	28.1
2001	3.8	8.3	1	1.1	1.1	4	1291	1.2	121.5	0.3	47.2	3.7	1.1	0.7	29.2
2002	3.8	8.3	1	1.1	1.1	4.5	1251.1	1.5	125.4	0.3	48.6	3.7	1.1	0.7	31.3
2003	3.8	8.3	1	0.9	0.9	5.9	1191.6	1.5	115.9	2133.8	46.6	3.7	0.9	0.6	30.7
2004	3.8	8.3	1	0.8	0.8	6.2	1145.3	1.4	108.2	1453.4	45.3	3.7	0.8	0.5	28.8
2005	3.7	8.2	1	0.8	0.8	5.8	1024.1	1.3	110.2	1472	44.1	3.7	0.8	0.5	28.3
2006	3.7	8	1	0.8	0.8	5.7	954.8	1.4	116.3	1467.4	45.3	3.7	0.8	0.5	27.2
2007	3.7	7.6	1	0.7	0.7	5.6	929.3	1.3	117.8	1254.6	41.3	3.7	0.7	0.5	25.6
2008	3.8	6.9	1	0.7	0.7	5.4	1102	1.3	103.4	1193.1	43.5	3.7	0.7	0.5	24.9
2009	3.8	6.8	1	0.7	0.7	5.5	1276.9	1.5	93.6	1170	48.4	3.7	0.7	0.6	31.7
2010	3.8	6.8	1	0.8	0.8	5.6	1156.1	1.5	87.8	1170	45.7	3.7	0.8	0.6	30.4
2011	3.8	6.5	1	0.7	0.7	5.9	1108.3	1.7	79.8	1170	46.7	3.7	0.7	0.6	29.4
2012	3.8	6.3	1	0.8	0.8	6.1	1126.5	1.8	79.8	1166.2	53.4	3.7	0.8	0.6	30.8
2013	3.8	6.2	1	0.8	0.8	6.9	1094.9	1.9	97.6	1166	58.6	3.7	0.8	0.6	31.8
2014	3.8	6.1	1	0.8	0.8	7.1	1053	2.2	105.9	1166	61	3.7	0.8	0.6	38.4

* Data from database: World Development Indicators

Is there a Link between Profit Share Rate of Participation Banks and Interest Rate?: The Case of Turkey

Cem Korkut¹ and Önder Özgür²

Today, the sensitive side of national economies is financial sector. The main reason for this sensitivity is financial crises. This situation has increased the demand and orientation for Islamic finance as a substitute for the modern financial system. The Islamic finance is discussed as a real solution to financial crises because the Islamic finance methods and applications depend on real economic activities. Both this case and the distance that is taken by Muslim countries in recent years has increased the share of Islamic banking/finance in the world. Thus, it has been a long debate in Islamic finance literature to investigate the presence of dependency between profit share rate settled by participation banks and deposit interest rate offered in conventional banking. In this study, variables that affect profit share rate of participation banks and deposit interest rate of conventional banks are examined over the period between January 2006 and May 2015 in Turkey. Multiple regression analysis is made by OLS method and Granger Causality is applied. Empirical results are pointed out that interest rate on government security and foreign exchange rate are significantly effective on participation banks' profit share rate. In addition, the profitability of conventional banks, government security, and foreign exchange rate are significantly effective on deposit interest rate settled by conventional banks. Besides, Granger causality analysis stressed that there is bidirectional causal relationship between profit share rate and interest rate. The main reason for this link between conventional interest rate and profit share rate arises with the dominance of murabahah, simple buy and sell with term sale transactions, at Islamic financial institutions. The interest rate is a benchmark for participation banks to determine the profit share rate. To get rid of this dependency, Islamic financial institutions may tend towards mudarabah transactions.

Keywords: Islamic banking and finance, participation banks, banking system, rate of returns, profit share rate, interest

JEL: C32, C58, Z12

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1. Introduction and Brief History of Islamic Financial Institutions

The prohibition of interest in Islamic economics draws the broad contours of borrowing and lending³. Thus, Islamic financial instruments are shaped by this ban. Moreover, the Islamic shares should not contain the firms that are engaged in interest, alcoholic beverages, pork etc. Although many restrictions may seem, Islamic finance is spread on a wide spectrum. Because the flexibility of Islamic jurisprudence has led the Islamic societies to find many solutions to overcome prohibitions. These solutions are based on production and commercial due to interest rate ban.

In addition, the Islamic financial institutions and banks arise from the Middle East and Southeast Asia regions. Because, the interest-based system is prohibited in these regions by Islam, and direct these societies to alternative kinds of systems. Bahrain and Malaysia are the major hubs of the Islamic banking in the world. However, these kinds of banks appear not only in Islamic societies but also exist in non-Islamic societies. They spread across from these regions to Europe and United States in time (Ahmad and Noor, 2011, p. 1).

Dealing of interest is the major difference between the conventional banking and Islamic banking. Interest is mainly used in debt and finance in the conventional banking system. The all conventional banking system is based on debt money. There is a huge difference between the real money and the alleged money in the market because of money creation mechanism. Yamaguchi (2011) claims that this debt money system causes financial failures/crises in the economy. Thus, the Islamic finance can be a solution to these failures. Because, there is no fake money creation due to all transactions are depended on true commodities. Furthermore, sharing risk composes the fundamentals of the Islamic finance (Ng, Mirakhor, & Ibrahim, 2015, p. 161). However, this is not valid for the modern conventional banking system. Islamic

³ Surah Al-Baqarah, Quran (2:275) Those who consume interest cannot stand [on the Day of Resurrection] except as one stands who is being beaten by Satan into insanity. That is because they say, "Trade is [just] like interest." *But Allah has permitted trade and has forbidden interest.* So whoever has received an admonition from his Lord and desists may have what is past, and his affair rests with Allah. But whoever returns to [dealing in interest or usury] - those are the companions of the Fire; they will abide eternally therein.

banking system is similar to conventional banking system but it is mainly based on profit and loss sharing between the borrowers and banks (Khan and Mirakhor, 1987). So, the major component which is non-fixed-interest-rate regime forms all the transactions in Islamic banking. Islamic banks generally offer three main types of account for their clients; current account, saving account, and investment deposit account (Bessadet and Karema, 2009). In addition, there are five basic contracts in Islamic finance: *Mudarabah*, *Musharakah*, *Murabahah*, *Ijarah*, and *Salam* (Smaoui and Salah, 2011, pp. 3-4). Transactions in Islamic banking are mainly developed around these contracts. But, new halal Islamic banking products are launched with the developments in Islamic banking in time.

Despite the advantages of the Islamic banks over the conventional banks, there are also some weaknesses of these kinds of banks which include theoretical issues and operational issues. Islamic banking is strictly based on Sharia rules. Thus, practice in banking area cannot begin without handling Sharia issues. However, since the weak communication between the jurists and the financial engineers, issues can't be handled easily. Because, each group has a different language, method, and mentality. On the other side, Islamic banks should consider issues, risk management, internal audit, transparency etc., like conventional banks because of Basel II rules (Iqbal and Molyneux, 2005, pp. 105-122).

1.1. Islamic Financial Institutions in the World

We will not focus the history of Islamic finance and banking in this study. However, it can be said that the modern studies on Islamic finance were started at the beginning of the 1950s (Can, 2014). Addition to this, first modern applications of Islamic finance brought out in 1963 with the Mith Ghams Savings Bank administrated by Ahmad El-Naggar in Egypt (Wilson, 1983, p. 76). The other modern Islamic financial institutions were founded after Mith Ghams Savings Bank. However, it was known that there were cash waqfs (CWs) in Ottoman that operated as Islamic financial institutions since the 15th century. They met the demand for credit. The cash needs of artisans, merchants and other entrepreneurs were provided by CWs (Bulut, 2005, s. 450). They were operated with the methods (qardh⁴, mudarabah⁵, bidaa, murabahah⁶,

⁴ Interest-free loan also called as beautiful loan

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istighlal⁷, rental transformation, the remuneration from Awqaf-ı Humayun, istirbah at Kismet-i Askeriyye Court) under the Islamic fiqh (Çam, 2014, s. 40). Thus, they can be accepted as pioneers of Islamic financial institutions. These waqfs have been successful in terms of both economic needs and charity services.

Table 1. Pioneers of Modern Islamic Financial Institutions in World

Institution	Head Office	Founded	Ownership Status
The Investment Corporation of Pakistan	Islamabad	1966	Private companies 75%, institutional investors 20%, public 5%
Nasser Social Bank	Cairo	1972	Egyptian state owned (100%)
Dubai Islamic Bank	Dubai	1975	Joint stock company with 10% Kuwait government share
Kuwait Finance House	Kuwait	1977	Kuwait government 49%, private investors 51%
Faisal Islamic Bank of Sudan	Khartoum	1977	Sudanese citizens and state institutions 40%, Saudi private citizens 40%, other nationals 20%
Faisal Islamic Bank of Egypt	Cairo	1977	Egyptian citizens and state institutions 51%, Saudi and other Arab nationals 49%
Jordan Islamic Bank for Finance and Investment	Amman	1978	Jordanian private investors 98,7%, Housing Bank 1.3%
Bahrain Islamic Bank	Manama	1979	Bahrain citizens, government and social security fund 30%, Kuwaiti interest 30%, Dubai Islamic Bank 5%, Saudi investors 35%
Iran Islamic Bank	Tehran	1979	Iranian merchants 100%

Source: (Wilson, 1983, p. 81)

⁵ Trust financing partnership; a contract between a capital provider (rabbul mal) and an entrepreneur (mudarib) under which the rabbul mal provides capital to be managed by the mudarib and any profit generated from the capital is shared between the rabbul mal and mudarib according to mutually agreed profit-sharing ratio while financial losses are borne by the rabbul mal provided that such losses are not due to the mudarib's misconduct, negligence, or breach of specified terms (Ng, Mirakhor, & Ibrahim, 2015, p. 184)

⁶ Sale and purchase contract where the acquisition cost and the mark-up are disclosed to the purchaser (Ng, Mirakhor, & Ibrahim, 2015, p. 184)

⁷ Collateral for borrowed cash from cash waqf used in the Ottoman period (Ng, Mirakhor, & Ibrahim, 2015, p. 184)

The pioneers of modern Islamic financial institutions in World, especially in the Middle East were listed in Table 1. It was thought the first modern bank was founded in the 15th century. This situation shows the differences of mentality between civilizations. The interest ban can be considered as the reason of rapid developments in modern banking in West not in Islamic civilization. However, the Western countries noticed the great potential of Islamic economics and finance future and some of the Western banks started to found Islamic finance department that operated under Islamic principles in their own structure. Such as, London became one of the centers of Islamic financial institutions in the world (Khorshid, 2004, p. 15).

Although some people thought that there are suspicions about financing terrorist organizations, the demand for Sharia-complaint funds increased even post-September 11. These Islamic financial institutions spread through various countries from Bahrain to Malaysia, even in secular countries like England and Australia (Venardos, *Islamic Banking & Finance in South-East Asia Its Development & Future*, 2006, p. 25).

1.2. Participation Banking in Turkey

Modern Islamic financial institutions began to operate with the law that was accepted at 16.12.1983 in Turkey. This kind of institutions was named as Private Financial Institution or Private Finance House⁸. Taking capital flows of Middle Eastern countries into Turkey is the main goal of these institutions. On the other hand, there were other interest-free applications in Turkey before 1983. One of them was State Industrial and Workers Investment Bank (DESIYAB). This organization was run by the state. But, it did not continue using interest-free application. Thus, it can be thought as an unsuccessful attempt for Turkey (Karapınar & Doğan, 2015, pp. 24-25). First, Albaraka Türk Private Financial Institution have been founded to operate in 1985. Then, Kuwait Türk Awqaf Financial Institution established in 1989. After that, in chronological order, Anadolu Financial Institution in 1991, İhlas Financial Institution in 1995, and Asya Financial Institution in 1996 were established as Islamic institutions after the law.

⁸ Özel Finans Kurumları in Turkish.

The approach of Turkey differs from the world about Islamic finance. Turkey does not prefer to use Islam and banking terms side by side. So, these financial institutions are called as participation banks generally not Islamic banks. Moreover, the Islamic financial institutions also use participation term rather than bank, like Al Baraka Participation, Vakıf Participation etc.

Four participation banks have been operated in Turkey for many years. This fact has curbed the development of Islamic banking in Turkey. On the other hand, the current government began to pay special attention to this area. Therefore, Ziraat Participation was founded in May 2015 with paid-in capital 675 million Turkish Liras⁹ as a first state participation bank. Moreover, again, another state participation bank, Vakıf Participation was founded in February 2016 with paid-in capital 805 million Turkish Liras¹⁰. The studies about another state participation bank, Halk Participation are still ongoing. This shows that the ratio of participation banking over total sector will rise in time. Thus, Turkey can be found to catch the chance of being one of the interest-free financing sector centers. Turkey has a serious potential especially with its location to accumulate the capital that is distributed to secular Western countries. In this respect, the state's supports to participation banking sector is crucial.

1.3. The Existing Participation Banks in Turkey

There are six participation banks in Turkish banking sector now¹¹: (1) Albaraka Türk Participation Bank, (2) Bank Asya, (3) Kuveyt Türk Participation Bank Inc., (4) Türkiye Finans Participation Bank, (5) Vakıf Participation Bank and (6) Ziraat Participation Bank.

⁹ <http://www.ziraatkatilim.com.tr/en/our-bank/Pages/about-us.aspx>

¹⁰ <http://vakifkatilim.com.tr/hakkimizda/index.html>

¹¹ The information is taken from Participation Banks Association of Turkey (TKBB)

Table 2. Shares of Participation Banks in Turkish Banking Sector

	January 2016
Collected fund	5,9%
Given fund	5,2%
Total assets	5,0%
Equity	4,0%
Net Profit	0,9%

Source: Participation Banks Association of Turkey

The total assets of participation banks are 119.804 million TL in January 2016. This means that the share of total assets of participation banks in total banking sector is 5,0%. The aim of Turkey is that reaching the share of participation banks in the total banking sector 15% in 2023.

2. Literature Review

It has been a long debate in Islamic finance literature to examine whether there is a correlation between profit share rate offered by participation banks and interest rate settled in conventional banking. Furthermore, there is a wide range of studies in the literature to stress the determinants of the volume of deposits settled in participation accounts and the factors influencing the profit share rate offered by participation banks both in Turkey and other Muslim societies in which participation banks operating. In this part of the paper, we aimed to mention briefly to these studies chronologically both in a single country and multi-country basis.

Haron and Ahmad (2000) examined the volume of participation accounts settled in Malaysian participation banks by using monthly data covering the period between January 1984 through December 1998. Results of their study highlighted that there is an inverse relationship between the interest rate offered by commercial banks and the volume of participation accounts. Thus, their findings revealed that the people who deposited their savings in participation accounts stimulated with the profit motive and they do not act the way compatible with Shariah doctrines.

Chong and Liu (2009) investigated the deposit rates in commercial banks and profit share rates in participation banks for the banks running in Malaysia during the period between April 1995 and April 2004. They utilized Engle-Granger error correction method to analyze the causal relationship between the deposit returns of participation and commercial banks. Results of their study pointed out that the Islamic investment rates are sensitive to changes in conventional interest rates settled by commercial banks in the long-term. Similarly, **Zainol and Kassim (2010)** analyzed the Malaysian banking sector with monthly data over the period January 1997 and October 2008. They concluded that Islamic banks' rate of return and deposit banks' deposit rate is co-integrated. Also, they revealed that there is a bi-directional causal relationship between rate of return and deposit interest rate.

Moreover, **Abduh et al. (2011)** investigated the dynamic relationship between the volume of participation accounts in participation banks and interest rate, profit share rate, production level, inflation and crisis in Malaysia. They used monthly data between January 2000 and December 2010 and employed co-integration test and vector error correction method. Their findings stressed that changes in interest rates, profit share rate, and production level growth is not significantly effective over the amount settled in participation accounts whereas inflation has a negative effect on participation accounts.

Aziz et al. (2014) aimed to point out the macroeconomic variables that influence the volume of participation accounts in Qatar by using quarterly data over the period between 2006 and 2013. They employed co-integration test and vector error correction methodology. Empirical results of their study highlighted that deposits in participation banks are not influenced by conventional banks' interest rate, Islamic banks' profit rate, and other macroeconomic indicators. **Cevik and Charap (2011)** investigated the correlation between profit share rate and commercial bank deposit rate in Turkey and Malaysia by gathering monthly data between January 1997 and August 2010. Empirical results of their study pointed out that profit share rate and deposit rate are co-integrated both in Turkey and Malaysia. Also, they revealed that there is unidirectional causal relationship between profit share rate and conventional interest rate. In addition, volatility of these two variables are highly correlated in Turkey and Malaysia.

Moreover, **Yusof et al. (2015)** analyzed the correlation between commercial bank deposit rate and participation banks profit share rate in GCC countries (Bahrain, Saudi Arabia, UAE, Kuwait, and Qatar) with 18 participation banks between 1998 and 2010. Empirical results of their study pointed out that, as it is expected and compatible with Sharia, deposit banks interest rates and profit share rate are not co-integrated in the long-run, and there is no correlation between these two in the short-term. **Meslier et al. (2016)** further analyzed the pricing behavior of commercial and participation banks in 20 countries which comprises dual banking system over the period between 2000 and 2014. They mentioned that conventional banks operating in dominant Muslim societies set higher prices to attract depositors. Also, empirical results of their study stressed that market power is not statistically significant for participation banks whereas commercial banks can set lower interest rates.

There are also some studies aiming to analyze the variables affecting deposits in commercial and participation banks in Turkey. **Ergeç and Arslan (2011)** examined the impact of interest rate shocks on the volume of participation accounts and deposits held by participation and commercial banks respectively in Turkey. They used monthly data for the period from December 2005 to July 2009 and employed vector error correction methodology. Empirically, they presented that deposits held by conventional banks respond negatively to a positive interest rate shock up to 4 months, then the response turns to positive whereas deposit in participation banks respond negatively to a positive interest rate shock up to 11 months. Briefly, they concluded that deposits held by participation banks are affected by interest rate changes.

Likewise, **Aysan et al. (2014)** analyzed the response of deposits settled in conventional and participation banks operating in Turkey to interest rate changes. They divided the depositors into five groups according to their deposit size and utilized panel vector autoregression method in order to display dynamic effects of interest rate shocks on deposits. Results of their study pointed out that in conventional banks, except largest owner group other deposit owner groups are not sensitive to interest rate changes. However, in participation banks except for smallest deposit holders, all respond significantly and negatively to interest rate shocks. Moreover, by using aggregated data in both banking forms, the amount of deposits settled respond negatively and

significantly to a positive interest rate shock. Furthermore, **Çetin (2014)** examined the relationship between deposits held in participation banks and financial variables in Turkey over the period between December 2005 and November 2013. Jonahsen co-integration test results displayed that, all the variables that are participation bank deposits, 3-month Libor rate, 1 ounce London gold price and Turkey's CPI are co-integrated in the long-term. Also, according to VAR analysis, 3-month Libor rate is more effective to explain the variation in the volume of participation bank deposits than the other variables.

In their study that analyzes the causal relationship between conventional banks deposit rate and participation banks' rate of return in Turkey, **Ergec and Kaytanci (2014)** used monthly data covering the period between 2002 and 2010. They performed Granger causality method and the results of their study stressed that time deposit interest rates are the Granger cause of the participation banks' rate of return. Briefly, it is concluded that participation banks are sensitive to changes in interest rates settled by conventional banks in Turkey. Currently, **Saraç and Zeren (2015)** further analyzed the long-run relationship between conventional bank time deposit rates and participation banks profit share rate by employing Maki co-integration test with multiple breaks and frequency domain causality tests over the period December 2001 and August 2013 for the banks operating in Turkey. Co-integration test results represented that rate of returns in two banking forms pegged together in the long-term. Also, frequency domain causality test results displayed the fact that there is a permanent causality runs from conventional bank deposit rate to participation banks' profit share rate.

3. Data and Methodology

Economic relationships generally include more than one independent variable.

In this study, two econometric models are constructed for modeling determinants of PSR (profit share rate of participation banks) for participation banking and IR (interest rate of deposit banks) for deposit banking. The main goal of this study is estimating coefficients of determinants of PSR and IR models based on OLS method. For this purpose, Eq. 6 and Eq. 7. are set up, respectively. These analyses are based on monthly time series data which cover the period of 2006M1-

2015M5 for Turkish banking sector. TREND is included to models as a linear time trend, ε is the error term. Description of data is represented in Table 1. Returns of GOLD, BIST (Borsa İstanbul, stock exchange), GS (government security), FX (foreign exchange rate), and PPB (net profit of participation banks) are the independent variables of Eq. 6. On the other hand, PDB (net profit of deposit banks) is included to Eq. 7 instead of the net profit of participation banks for estimating IR. PSR is calculated from average profit share rates of Albaraka Türk, Kuveyt Türk, Bank Asya, and Türkiye Finans¹².

$$PSR_t = \alpha + \beta_1 \Delta PPB_t + \beta_2 GOLD_t + \beta_3 BIST_t + \beta_4 GS_t + \beta_5 FX_t + \beta_6 TREND_t + \varepsilon_t \quad (2)$$

$$IR_t = \alpha + \beta_1 \Delta PDB_t + \beta_2 GOLD_t + \beta_3 BIST_t + \beta_4 GS_t + \beta_5 FX_t + \beta_6 TREND_t + \varepsilon_t \quad (3)$$

Table 3: Descriptions of Data

Abbreviations	Variables	Source	Unit
PSR	Profit Share Rate of Participation Banks	PBAT	Nominal monthly
IR	Interest Rate of Deposit Banks	CBRT	Nominal monthly
PDB	Net Profit of Deposit Banks	BRSA	Nominal monthly
PPB	Net Profit of Participation Banks	BRSA	Nominal monthly
GOLD	Return of Gold	TURKSTAT	Monthly real return (2003=100)
BIST	Return of Borsa İstanbul	TURKSTAT	Monthly real return (2003=100)
GS	Return of Government Security	TURKSTAT	Monthly real return (2003=100)
FX	Return of Exchange Rate	TURKSTAT	Monthly real return (2003=100)

Series are gathered from PBAT (Participation Banks Association of Turkey), CBRT (Central Bank of the Republic of Turkey), BRSA

¹² Ziraat and Vakıf Participation Banks are founded recently and the data is not sufficient for tests. The other issue is that Bank Asya had operations between the years 2006 and 2015. So, Albaraka Türk, Kuveyt Türk, Bank Asya, and Türkiye Finans are taken for correct test results.

(Banking Regulation and Supervision Agency), and TURKSTAT (Turkish Statistical Institute). All series are converted to seasonally adjusted monthly data in terms of real Turkish Liras. Census X-13-additive method is conducted for seasonal adjustments of series. Summary statistics that includes mean, median, maximum value, minimum value, standard deviation, skewness and kurtosis of dependent and independent variables are displayed in Table 4.

Table 4: Descriptive statistics of the variables

Descriptive Statistics	PSR	IR	PDB	PPB	GOLD	BIST	GS	FX
Mean	0.22	0.13	17.26	0.80	0.81	0.30	0.33	0.00
Median	0.24	0.13	17.40	0.78	0.24	0.45	0.44	-0.32
Maximum	1.77	1.77	23.18	1.20	16.98	20.63	5.24	15.19
Minimum	-2.15	-2.22	10.94	0.32	-10.97	-27.79	-5.21	-5.93
Standard Deviation	0.60	0.63	3.00	0.23	4.48	6.58	1.45	2.91
Skewness	-0.33	-0.26	-0.08	-0.03	1.19	-0.51	-0.45	1.84
Kurtosis	4.39	3.97	1.89	1.90	5.76	5.96	5.25	10.08

4. Econometric Results

Stationarity of the variables is a very significant issue to estimate an econometric model in time series analysis. Estimation results may be spurious when the series have unit roots. This makes t-stats of coefficients higher than they should be (Granger and Newbold, 1974). Thus, stationarity of the variables is tested with Augmented Dickey-Fuller (ADF) Test and Phillips-Perron (PP) Test in this study. Unit root test results for constant and constant and trend models are displayed in Table 5.

Table 5: Unit root test results

Variables	ADF Test		PP Test	
	Constant	Constant & Trend	Constant	Constant & Trend
PSR	-7.09***	-8.27***	-7.02***	-8.25***
IR	-6.63***	-8.58***	-6.72***	-8.60***
PDB	-1.63	-4.09***	-2.14	-4.09***
PPB	-1.06	-2.38	-1.03	-4.44***
GOLD	-8.27***	-8.33***	-8.31***	-8.37***
BIST	-8.16***	-8.13***	-8.13***	-8.10***
GS	-6.31***	-6.50***	-6.04***	-6.01***
FX	-7.42***	-7.41***	-7.13***	-7.11***
Δ PPB	-12.91***	-12.87***	-18.69***	-18.81***
Δ PDB	-11.05***	-11.00***	-14.26***	-14.20***

Note: Δ denotes difference operator. *** denotes 1% significance level.

Empirical results suggest that PSR, IR, GOLD, BIST, GS, and FX are stationary at their level values ($I(0)$). However, PPB and PDB are stationary at their first difference ($I(1)$). So, stationary variables should use in the OLS method in this study.

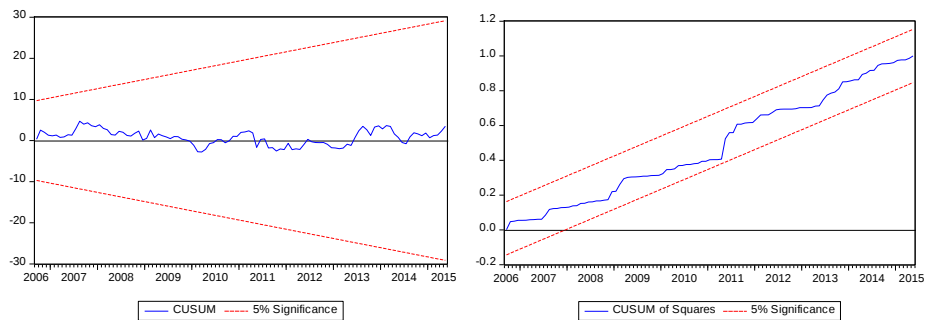
Econometric results of the PSR model is displayed in Table 4. Results suggest that GS and FX have a positive effect on PSR. A one-unit increase in return of government security leads profit share rate of participation banks to rise by 0.30 unit at 1% significance level. Moreover, a one-unit increase in return of foreign exchange causes profit share rate to increase about 0.04 unit at 5% significance level.

Table 6: Coefficients of PSR model

<u>Variables</u>	<u>Coefficients</u>	<u>t-Statistic</u>
C	0.44***	5.47
Δ PPB	0.87	1.24
GOLD	-0.01	-1.24
BIST	-0.00	-0.39
GS	0.30***	9.52
FX	0.04**	2.46
TREND	-0.00***	-4.76
<u>Descriptive Statistics</u>		
R^2	0.60 0.58 1.26 [0.53] 24.89 [0.58] 15.96 [0.00]	
Adjusted R^2		
Autocorrelation (LM Test)		
Heteroscedasticity (White)		
Normality (Jarque-Bera)		

Note: *** and ** denotes statistical significance at the 1% and 5% respectively. Figures in the square brackets are p-values.

Figure 1: CUSUM and CUSUMQ of PSR model



In order to test the presence of multicollinearity in the presented model we constructed correlation matrix in Table 7.

Table 7: Correlation Matrix for PSR Model

Variables	PPB	FX	GOLD	GS	BIST
PPB	1.00	0.18	0.18	-0.05	-0.14
FX	0.18	1.00	0.56	-0.40	-0.66
GOLD	0.18	0.56	1.00	-0.07	-0.39
GS	-0.05	-0.40	-0.07	1.00	0.55
BIST	-0.14	-0.66	-0.39	0.55	1.00

Furthermore, as an additional evidence to represent the lack of multicollinearity, centered VIF values are displayed in Table 8.

Table 8: Centered VIF Values for PSR Model

Variables	Centered VIF
PPB	1.04
GOLD	1.59
BIST	2.27
GS	1.61
FX	2.32

Both correlation matrix and centered VIF values demonstrated that there is no significant multicollinearity problem in the constructed PSR model.

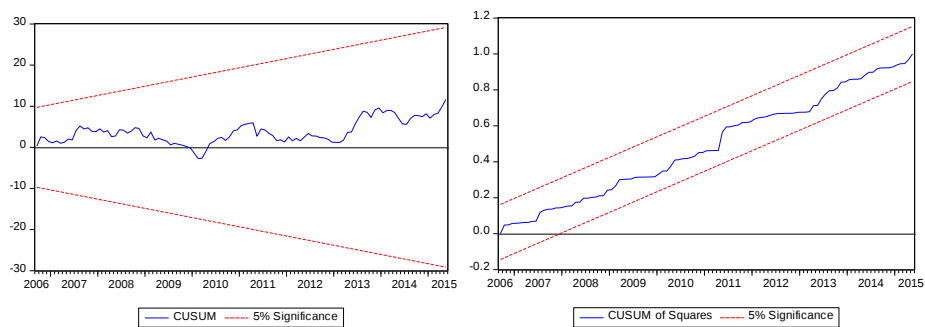
Results of IR model are showed in Table 5. Empirical results suggest that one-unit increase in PDB increases IR about 0.08 unit at 1% significance level. On the other hand, a one-unit increase in GS and FX both have a positive impact on IR about 0.30 unit and 0.05 unit at 1% significance level respectively.

Table9: Coefficients of IR model

<u>Variables</u>	<u>Coefficients</u>	<u>t-Statistic</u>
C	0.50***	6.42
Δ PDB	0.08***	3.13
GOLD	-0.01	-1.88
BIST	-0.01	-1.23
GS	0.30***	9.78
FX	0.05***	2.84
TREND	-0.00***	-7.08
<u>Descriptive Statistics</u>		
R ²	0.66 0.64 0.69 [0.70] 25.72 [0.53] 6.65 [0.03]	
Adjusted R ²		
Autocorrelation (LM Test)		
Heteroscedasticity (White Test)		
Normality (Jarque-Bera Test)		

Note: *** denotes statistical significance at the 1%. Figures in the square brackets are p-values.

Figure 2: CUSUM and CUSUMQ of IR model



All the estimated models above pass the diagnostic tests which include autocorrelation and heteroscedasticity successfully, except normality of disturbances. But, OLS is still BLUE (Best Linear Unbiased Estimators) if the disturbances don't have a normal distribution (Baltagi, 2008: 98). Furthermore, CUSUM and CUSUMQ fall within the lines at 5% significance level as seen in Fig. 1 and Fig. 2. So, both PSR and IR

models are effective with stable recursive residuals. Thus, these two models don't include structural breaks.

Similarly, to test the existence of multicollinearity problem in an employed IR model we examined correlation matrix and uncentered VIF values. Results are represented in Tables 10 and 11.

Table 10: Correlation Matrix for PSR Model

Variables	PDB	BIST	GS	FX	GOLD
PDB	1.00	0.01	-0.05	0.01	0.09
BIST	0.01	1.00	0.55	-0.66	-0.40
GS	-0.05	0.55	1.00	-0.40	-0.08
FX	0.01	-0.66	-0.40	1.00	0.56
GOLD	0.09	-0.40	-0.08	0.56	1.00

Table 11: Centered VIF Values for PSR Model

Variables	Centered VIF
PDB	1.02
GOLD	1.60
BIST	2.28
GS	1.62
FX	2.32

Empirical results of the two regression models stressed that GS and FX are significant for both IR and PSR. Thus, it comes to an issue that participation banks may use deposit bank interest rate as a benchmark so GS and FX are significant both for IR and PSR. Therefore, to test this prospect we also applied Granger causality test indicating the causal relationship between IR and PSR.

To apply Granger causality test employed variables must be stationary. Both of PSR and IR are stationary at a level so they are included with their I(0) values in causality analysis. Following two models are utilized to test the direction of causal relationship between PSR and IR (Granger, 1969).

$$PSR = \sum_{i=1}^m a_i PSR_{t-i} + \sum_{i=1}^m b_i IR_{t-i} + \varepsilon_i \quad (3)$$

$$IR = \sum_{i=1}^m c_i IR_{t-i} + \sum_{i=1}^m d_i PSR_{t-i} + \eta_i \quad (4)$$

$$E[\varepsilon_i \varepsilon_s] = E[\eta_i \eta_s] = 0 \text{ and } t \neq s \quad (5)$$

Granger causality test is sensitive to the selection of lag length. Suitable lag length is 4 in our analysis according to minimum Akaike Information Criteria (AIC). “m” represents the lag length in equations (4) and (5). Granger causality analysis tests causal relationship from IR to PSR by testing $H_0 = b_1 = b_2 \dots = b_m = 0$ and from PSR to IR by testing $H_0 = d_1 = d_2 \dots = d_m = 0$. If H_0 is not rejected then it is said that there is no causal relationship (Pamuk and Bektaş, 2014). Granger causality test is applied based on VAR model since PSR and IR are the variables that are I(0). Results of the causality test are summarized as follows:

Table 12: Granger Causality Test Results

The Way of Causality	H0 Hypothesis	Chi-Square Prob. Value	Result
PSR → IR	PSR is the Granger cause of IR.	0.002*	Do not reject H_0 .
IR → PSR	IR is the Granger cause of PSR.	0.013**	Do not reject H_0 .

Note: * represents 1% and ** represents 5% significance. →, shows the direction of causality.

Findings of the Granger causality test indicated that there is a bidirectional causal relationship between PSR and IR. Thus, it is reasonable to say that both PSR and IR can be used as a tool for forecasting of another variable.

5. Conclusion

Islamic banking and finance sector increases its importance for developing countries. The opportunities that it creates is crucial for economic development and growth for these countries. This sector provides economic and financial stability for developing countries because it depends on the real sector. It opens up opportunities for growth both financial and real sectors. Although Turkey had an important history about Islamic finance institutions as Ottoman cash waqfs, it met these opportunities very late. However, the recent developments show that Turkey notices the potentials and possibilities at this sector. The new participation banks that are founded by government, the educational developments at Islamic economic and finance, the aim of making Istanbul as a finance center etc. shows the Turkey's intentions about this sector. On the other hand, the participation banks in Turkey depend heavily on the conventional financial sector and its instruments. In this study, the OLS model shows that the return of government security affects the profit share rates of participation banks. This situation is not covetable for Islamic finance sector. One of the reasons for this situation is that the murabahah transactions are the most used instrument at Islamic institutions. This wide usage of murabahah prevents the strong relations between production industry as real sector and financial sector. If the mudarabah transactions can become widespread for the sector, this keeps Islamic institutions from being depended on conventional financial industries. It is normal for IR becoming benchmark for PSR, because murabahah is a simple purchasing and term sale transaction. Participation banks do not take initiative in determining profit for term sales. The interest rate of credit in the market is determinant for PSR. However, the mudarabah is related to the real sector and production. Therefore, this method will finance production. The profit from the production is different from the interest because it is variable. Even, the profitability is different in different sectors. The mudarabah, production-oriented, is not focused on consumption like murabahah. Mudarabah, known as venture capital in the modern financial system, can create a PSR as a benchmark for this sector with the spread of such transactions. The effect of exchange rates is originated from partnership structure of banks because many of them have foreign partners and the capital is closely related to exchange rate. In addition, financial integration is another reason for the effect of the exchange rate.

In conclusion, Turkey as a developing country has an aim to make Istanbul a financial center. Its historical background and natural borders show that Islamic capital can see the Turkey as a safe port. Thus, if the correct financial policies are applied in Islamic banking and finance sector, Turkey can be a unique choice for Muslim countries, Muslims and others that are willing to invest ethic financial instruments. The support of production-based financing instruments will also provide economic growth. Thus, both Turkey and investors will win.

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