



The Causal Relationship Model between Financial Development and Economic Growth in Yemen

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Abstract

Slow growth has been the case in the Middle East and North Africa (MENA) region in the 1970s and 1990s. The financial sector performance of most MENA countries in the 1990s to early 2000s has been dismally limited, with uneven reforms in the financial sector, the banking sector is characterized by poor credit allocations, losses and liquidity problems and wide interest rates spread. This situation was the case for Yemen, the growth performance of the country in the last decades was mixed. The financial sector performance is mixed and largely attributed to weak intermediation, inadequate legal and judicial environment, institutional and administrative bottlenecks in conducting banking and financial services. Given the role of finance on growth, we investigate the link between financial sector development and economic growth in Yemen from 1991-2011, using the Error Correction Model (ECM) and Granger Causality test. This study shows that the overall financial depth and credit to the private sector have positive impact on growth. While, interest rate spread, real

exchange rate and inflation negatively affects growth. There is evidence of co-integration and bi-directional relationship between financial sector development and economic growth in Yemen. This study contributes to current literature by providing an econometric understanding of relationship in finance and economic growth for the MENA countries. This understanding is important for academics, policy makers and development organizations in shaping the future financial sector infrastructure and economic growth.

Keywords:

Financial Sector Development; Economic Growth; Error Correction Model (ECM); Causality Test and Yemen

1. Introduction

The relationship between financial sector development and economic growth is a controversial issue because we are most concern about poor performance in the financial sector that can lead to failures and crises in the



sector and hence impacts negatively on the economic growth. This research does not undermine poor financial sector performance and the devastation it may caused on the financial sector and the overall growth climate. It is the case that, recently the world witnessed one of the most devastating financial meltdowns of 2007-2009 since the great depression of the 1930s and affected investment, employment, remittances and trade thus leading to world recession.

The nature of the relationship between finance and economic growth has been one of the most debated in the recent past, yet with little consensus. Central to this debate is the question of whether strong economic performance is finance-led or growth driven. The issue is because the determination of the causal pattern between finance and growth has important germane implications for policy-makers' decisions about the appropriate growth and development policies to adopt. The fact that strong correlation exists between finance and economic growth has been well documented in the economic development literature. However, previous empirical studies have produced mixed and conflicting results on the nature and direction of the causal relationship between finance and economic growth.

For instance, Warman and Thirlwall (1994), and Athukorala (1998) arrive at rather opposite conclusions. For the case of Mexico over the period 1960 to 1990, Warman and Thirlwall (1994) find a positive impact of real interest rates on financial savings alone. Athukorala (1998) shows a positive impact of interest rates

on all kinds of savings for India in the period 1955 to 1995, even though a weaker one for total saving (which includes the public sector). He is not able, however, to detect significant evidence for asset substitution as predicted by the neo-structuralists.

Slow growth has been the case in the Middle East and North Africa (MENA) region in the 1970s and 1980s. This worsened in the 1990s partly as a result of civil unrest and political instability in the region which adversely affected planning and growth. The financial sector performance of most MENA countries in the 1990s spanning to early 2000s has been dismally limited, with uneven reforms in the financial sector, the banking sector is dominated by public sector banks, which are characterized by government intervention in credit allocations, losses and liquidity problems and wide interest rates spread. Given the growing concern by MENA countries to improve on the poor growth episodes and financial sector restraints of the 1970s to 1990s, development of the financial sector attracted considerable attention from policy makers across the region with prudent reforms in the sector by improving access to finance for investment and extensive liberalization of the financial sector in the region. (International Financial Institutions and Yemen Country Report, 2007)

This scenario was the case for Yemen, the growth performance of the country in the last decades was weak, and classified as the poorest country in the MENA region, coupled with the range of successive crises and growth challenges led to increase in poverty and food



insecurity. The financial sector in Yemen is dominated by the banking sector, as is the case for most developing countries and is considered one of the weakest in the MENA region. Financial intermediation is weak and largely attributed to weak legal and judicial environment, access to finance outside the capital city among small business and the poor in agriculture is very limited. Physical barriers to financial sector deepening posed by weak infrastructure exacerbated by institutional and administrative bottlenecks in conducting banking and financial services. Outside the banking sector, key supporting institutions and financial markets are either non-existence or play a very limited role, the sector was significantly affected by the uncertainties of the 2011 crisis leading to a fall in banking balance sheet as large deposit withdrawals in both local and foreign currencies were made. (Financial Infrastructure Development Project of Yemen, 2013)

To address these problems, Central Bank of Yemen (CBY) and the Banking Acts were revised in 2012, to provide sound legal framework, increasing the scope of financial liberalization and intermediation consistent with a more Independent Central Bank and effective banking supervision. These measures resulted to good overall financial performance in the country. Despite the progress made thus far, the sector is still faced with systematic and institutional inefficiencies, these have contributed to the high cost of financial intermediation, the inadequate financing productive investment especially, for small and medium enterprises, high volume of

non-performing loans, inadequate judicial and legal procedures for loan recovery, inadequate credit risk management evaluation mechanism, weak supervision and enforcement of prudential regulations. (Central Bank of Yemen Annual Report, 2013)

Now that growth promotion in the financial sector is being actively supported by the International Monetary Fund (IMF), the World Bank and other International Financial Institutions (IFS) including the Government, all these efforts requires research to find out the link between financial sector development and economic growth in Yemen. The economy of Yemen provides a good laboratory test as it has fraught with weak financial sector performance and poor growth for a very long time and coupled with the global financial crisis and the bailouts in 2007-2009, we ask the question, can development in the financial sector useful for increased economic growth?

Therefore, the purpose of this paper is to investigate empirically the link between financial sector development and economic growth in the economy of Yemen using data from World Development Indicators from 1991-2011, on financial sector indicators and control variables. The Ordinary Least Squares (OLS) regression within the framework of Co-integration test and the Granger causality test is applied in the study to determine the first and second hypotheses. An investigation in to these issues will help provide guidelines for sound financial sector reforms that can enhance the quality of financial sector development and can also be used to design policy that can promote investment in productive sectors and



hence economic growth. This study contributes to the current literature in the following ways;

This study is the first in the context of Yemen to assess the link between financial sector development and economic growth. Second, studies on the effect of interest rate spread on finance are rare; this study incorporates the interest rates spread to capture its effect on financial sector development and economic growth in Yemen. Third, it contributes to the literature by providing an econometric relationship of finance and growth in Yemen, this understanding is important for academics and policy makers in shaping the future stability of the financial sector in the MENA region and globally. Primary weakness of the study is limited availability of the data. Analysis is therefore restricted to a smaller number of variables than desired because of these restrictions. However, sufficient data is available for the purpose of this research.

The rest of this paper is structured as follows: section 2 provides is the literature review, section 3, is methodology and data, section 4, the empirical results and discussions and finally, section 5 is the conclusion. Graphs/ Figures are shown as Appendix.

2.0 Literature Review

This section reviews theory and empirical literature in the context of developing and developed countries and to review a broader literature strand on the connection between financial sector development and economic growth. Available literature is presented between interest rates and economic growth, financial liberalization and economic growth

and financial intermediation and economic growth.

Mckinnon (1973) and Shaw (1973) in addressing the adverse effects of “financial repression” on economic growth, they refer to financial repression as the distortion of domestic financial markets through measures such as ceiling on interest rates and credit expansion, selective allocation of credit and high reserve requirements, they pointed out that such misguided policies have damaged the economies of many developing countries by reducing savings and encouraging investment in inefficient and unproductive activities. The standard recommendation is then positive real interests are established on deposit and loans by eliminating interest and ceiling, stopping selective credits allocation and lowering reserve requirements. The true scarcity prices of capital could then be seen by savers and investors leading to improved allocative efficiency and foster output growth. On the other hand, Stiglitz and Weiss (1981) observed that raising interest rates have favourable effects on financial intermediation and on growth. However, they noted also that excessively high real interest rates have adverse economic effects, it is the case that extremely high interest rates will not permit the financing of investments projects that otherwise have good economic rational and will favour projects that have a high risk. The latter problem became known as the heat of “adverse risk selection” on the assumption that risk tends to rise with the rate of return.

DornBusch and Reynoso (1989) underscored the importance of attaining



macroeconomic stability prior to financial deepening. They noted that high and unstable inflation often increases the demand for financial deepening, but this might trigger further increases in inflation especially if fiscal deficits are large and the exchange rate is depreciating rapidly. They concluded that domestic financial liberalization should be accompanied before external liberalization is undertaken. This is both to generate expertise and to establish domestic financial institutions including banks that can withstand the rigors of international competition and hence growth and development.

In the study by Barro (1999b), he highlighted that government policies play a crucial role in determining where an economy will go in the long-run. For example, fewer distortions of private and financial markets, favourable government policies for financial sector and growth stability, less non-government consumption and greater public investment in high-return areas and the maintenance of law and order will lead in the long-run to financial sector development and higher levels of real GDP. In the study of information based model of competitive banking industry which focuses on the feed-back relationship among banking specialization, the cost of monitoring and growth. Harrison et al, (1999) in their model, economic growth increases banks activities and profits and promote entry of more banks. This entry shortens the average distance between banks and borrowers, facilitates regional specialization and thus lowers the cost of financial intermediation (“the specialization effect”). This in turn boost investment and

economic growth. Demirque-Kunt and Detragiache (1997) viewed financial deepening as playing an important role in dampening the impact of external shocks on the domestic economy, concluding that financial systems without the necessary institutional development has lead to a poor handling or even magnification of risk rather than mitigation. These relationships provide the theoretical underpinnings for the current study.

In terms of the empirical evidence, a number of studies have been recorded, for instance, in a study by Fry (1995) in the Asian Development Bank’s combined times series observation and cross sectional data for India, Korea, Malaysia, Nepal, Pakistan, Singapore, Taiwan and Thailand, they found that the incremental output-capital ratio was positively associated with the real deposit rate with the later variable being statistically significant at 5-percent level. However, Gupta (1986) obtained conflicting result in a cross section study of India and Korea using dynamic multiplier analysis to examine the long-run effects of changes in nominal interest rates and inflation rates on economic growth. The result shows an unfavourable effect of higher interest rates on economic growth. However, the long-run multiplier shows the beneficial effect of raising interest rates on economic growth. In the case of India, the best results obtained on the nominal rate of interest rates and the expected rate of inflation remains the same. In the case of Korea, a decline in the expected rate of inflation with nominal interest rates remaining constant gives the best results. A possible explanation for the differences in the



result is the distortions introduced by combining countries with different structures.

A number of empirical tests on the relationship between economic growth and financial development have often used broad money and private sector credit to GDP ratios as measures of financial sector development. For example, the World Bank (1994) estimated that policies that would raise the M2/GDP ratio by 5% would increase the long-term per capita growth rate by 0.1–0.2% points. Arestis et al. (1997) use measures like stock market capitalization (scaled by GDP) and report that stock markets have made significant contributions to growth in Germany, Japan and France.

To understand the relationship between financial deepening and economic growth, researchers in recent time have also employed both firm-levels and industry-level data across a broad cross-section of countries in Europe and Latin America. These studies better addresses causality issues. For example, Demirguc-Kunt and Maksimovic (2005) uses firm level data and financial planning model to show that developed financial system-as proxied by larger banking systems and more liquid stock markets-allow firms to grow faster than they can finance internally. Consistent with this study, Becks, et. al, (2005) also used firms level data in Asian countries of Indian, China and Bangladesh their results show that the sensitivity of investment to internal funds is greater in countries with less developed financial systems. Noting that financial deepening eases the obstacles that firms face to

growing faster and that this effect is stronger particularly for small firms and that finance promotes growth through productivity increases.

Mckinnon (1973) and Shaw (1973) and (Gelb, 1988 p.23) made estimates on the assumption that causation goes from financial intermediation to economic growth a “supply-leading” relationship. But the causation may also run from economic growth creates demand for financial services such a “demand following” relationship was postulated by Goldsmith (1969). However, Patrick (1976) suggested that the direction of causality changes in the course of economic development. In his view, financial development is necessary for sustained economic growth to take place but “as the process of real growth occurs the supply-leading impetus gradually becomes dominant.

On balance, literature survey reveals that numerous studies have looked at the nexus between financial sector reforms and economic growth; results of these studies are mostly inconclusive. These contradictory conclusions resulted from the empirical literature are one of the motivations for the present investigation. To the best of our knowledge this is the first study that looks at the connection between financial sector development and economic growth in Yemen, whose economy that is structurally constrained and the financial sector climate still quite underdeveloped. Findings of the study contribute to theory of financial sector development and economic growth. This is of important for policy makers to develop policies



for sustained financial sector development and growth. This understanding is also of significance to investors and businesses who seek to invest in profitable ventures for superior risk-adjusted returns in the financial sector.

3. Materials and Methods

The study adopts an empirical approach in the analysis. It makes use of secondary annual time series data collected from the World Development Indicators of the World Bank data base on Yemen from 1991 to 2011 on financial sector indicators and control variables that influenced growth of output. We propose the following hypotheses that can be tested or proven.

H₁: Long run equilibrium relationship exists between financial sector development and economic growth in Yemen

H₂: Causal relationship exists between financial sector development and economic growth in Yemen

According to Barro (1989a), the growth of real GDP is considered to depend on several variables. For the purpose of our study, the relationship between finance and growth can be augmented from the Barro-growth regression of financial development variables which takes the form thus;

$$\text{Growth} = \alpha_0 + \beta_i [\text{Finance}] + \gamma_i [\text{conditioning set}] + \mu_t$$

Where β_i the coefficient of the measures of financial sector development/indicators and γ_i is the coefficients of the set of control variables.

However, it is difficult to identify proxies for measuring financial sector development and

growth. For instance, Bec et al., (2005) discuss different indicators of financial development capturing the size, activity and efficiency of the financial sector, institutions or markets and taking a clue from previous studies by Mckinnon (1973) and Shaw (1973), Fry et al., (1988) and Demirguc-Kunt and Maksimovnic (2005). However, this study improves on their models by including the Interest Rates Spread (IRS) on deposits and loans to capture empirically its impact on financial sector development and economic growth in Yemen.

The regression model is therefore specified with the real GDP (RGDP) as dependent variable, measured as GDP growth on an annual basis adjusted for inflation. The explanatory variables comprise both the financial sector indicators and the control variables as follows:

Financial sector indicators

- FD = the overall financial depth of the financial system (measured as the ratio of broad money to GDP, ie M2/GDP), denoted as FD. (World Bank,1994)
- CPSF = the ratio of credit to the private sector to GDP, which is the value of loans made to the private enterprises and households used as a measure of financial sector development. (Levine and Zervos, 1996)
- IRS = the interest rate spread is calculated as the difference between the deposit and lending rates and measures the degree of competitiveness/ efficiency in the banking sector.

The control/conditioning variables include;

- RER = Annual real exchange rate
- INF= inflation, which is the average consumer prices, it measures the degree of uncertainties about the future market environment.

The model is specified thus,

$$RGDP = \alpha_0 + \alpha_1 FD + \alpha_2 CPSF + \alpha_3 IRS + \beta_1 RER + \beta_2 INF + \mu_t \quad (1)$$

Taking natural logarithm (ln) in equation (1) above, the model can be decomposed as follows;

$$\ln RGDP = \alpha_0 + \alpha_1 \ln FD + \alpha_2 \ln CPSF + \alpha_3 \ln IRS + \beta_1 \ln RER + \beta_2 \ln INF + \mu_t \quad (2)$$

From equation

(3), $\alpha_1, \alpha_2, > 0$ or < 0 , $\alpha_3, \beta_1, \beta_2, < 0$, and

μ_t is the error term/ unobserved term. The rationale for making these restrictions in the above model are based on economic theory and their expected behavior in the signs (coefficients to be estimated) can be tested in the analysis, it implies that a unit increase in the independent variable will lead to a unit decrease (< 0) or increase (> 0) in RGDP

3.1 Estimation Procedure

Most time series data are non-stationary, and using the OLS estimation technique may mean that the result obtained would be spurious and having no economic meaning. However, to overcome this problem, we test for the stationary of the data by applying the Augmented Dickey-Fuller (ADF) unit root test. (Hannan and Quinn, 1979). An econometric view (EView-6) is applied in the analysis

3.1.1 Unit Root Test:

The Augmented Dickey-Fuller (ADF) unit root test is a test of the null hypothesis that the series are non-stationary I (1) against the alternative hypothesis that the series are stationary I (0). (Dickey and Fuller, 1979; Hamilton, 1994).

The Augmented Dickey Fuller (ADF) test regression of a unit root is given by

$$\Delta x_t = \mu + \beta t + \delta x_{t-1} + \dots + \sum \delta_1 \Delta x_{t-1} + \delta_m \Delta x_{t-m} + \mu_t \quad (3)$$

Equation (3) contains a trend term and m is the lag terms introduced in the model as additional regressors to account for heteroskedasticity and auto-correlation. The inclusion of the time trend explains the importance attached to trended series but can be dropped if found to be insignificant; however, dropping it requires caution. Hence we include the time trend in the unit tests regressions in our study. We carry the tests under the condition that:

Null Hypothesis $H_0 : \delta = 0$, the series has a unit root (non-stationary) that is I(1) against the Alternative Hypothesis $H_1 : \delta < 0$ the series has no unit root (Stationary) that is I(0), if the calculated value of the tests statistic is less than the critical value at 0.05 of one tailed test, we reject H_0 and accept H_1 . That is the series is I (0), stationary otherwise the series is I(1), non-stationary.

3.1.2 Co-integration Test

Having found that the series are stationary, we proceed to test whether the dependent variable exhibit long run equilibrium-relationship with the explanatory variables or are co-integrated

using the Co-integrating Regression Augmented Dickey–Fuller (CRADF) test. This test uses residuals form of a co-integration regression; we estimate the model using OLS by minimizes the sum of the squares residuals. Engel and Granger in *Econometrica* (1987).

The Co-integration Augmented Dickey Fuller (CRADF) test regression equation is given by

$$\Delta e_t = \alpha_1 e_{t-1} + \delta_1 \Delta e_{t-2} + \dots + \delta_m \Delta e_{t-m} + \mu_t \quad (4)$$

From equation (4) Δe terms are included to eliminate any autocorrelation so that $\mu_t \sim \text{IID}(0, \delta^2)$, notice that there is no constant in the regression. A constant can be included in either the co-integrating regression or the CRADF but not both. (Mackinnon, 1991), we carry the CRADF test thus:

$H_0: \alpha_1 = 0$ and e_t are $I(1)$, the series are not co-integrated

$H_1: \alpha_1 < 0$ and e_t are $I(0)$, the series are co-integrated

The test statistics under the null has no standard distribution, if the calculated value of the test statistic is less-than the critical value, the null hypothesis of no co-integration is rejected; the series are co-integrated, m is the number of lagged terms is selected in the same way as for the unit root tests. We use Mackinnon (1991) critical values to make a decision on the test statistic and not the individual unit root values of the ADF test.

3.1.3 The Error Correction Model (ECM)

To ensure that the regression model is not spurious, we difference the series and following the Engel and Granger Representation Theorem (1987), we expressed a general ECM of the

form

$$\Delta \ln y_t = \alpha_0 + \sigma_1 \Delta \ln X_t + \sum_{i=1}^p \tau_i \Delta \ln Y_{t-i} + \sum_{i=1}^{p-1} \delta_i \Delta \ln X_{t-i} + \gamma \text{EC}_{t-i} + \varepsilon_t \quad (5)$$

Where ε_t is white noise, and γ is the coefficient of the error correction term (EC_{t-i}) which measures the speed of adjustment or the feedback effect which should be negative and statistically significant at any level of significance towards attaining the longrun equilibrium resulting from the series. σ_1 is the short run elasticity.

Equation (5) is appealing due to its ability by combining the short-run and long-run dynamics in a unified system. Hence the estimates of the parameters of the ECM are generally consistent and efficient. (Hendry and Richard, 1983)

3.1.4 Granger Causality Test:

The Granger (1969) causality procedure is developed to test for causal relation. According to Granger, Y causes X if the past values of Y can be used to predict X more precisely than simply using the past values of X and vice versa. The idea behind this test is to run the following bi-variate regression models, if we want to determine the direction of causality between X and Y

$$X_t = \gamma_0 + \sum_{i=1}^n \delta_i X_{t-i} + \sum_{j=1}^m \sigma_j Y_{t-j} + \mu_t \quad (6)$$

$$Y_t = \alpha_0 + \sum_{i=1}^n \alpha_i X_{t-i} + \sum_{j=1}^m \beta_j Y_{t-j} + \mu_{2t}$$

(7)

Where m and n are the number of lagged, X and Y are the terms respectively. μ_{1t} , μ_{2t} are the random errors and follows $N(0, \sigma^2)$, equation (6) predicts that X_t is related to past values of itself as well as that of Y_t and equation (7) predicts similar trend for Y_t . If we want to test whether X Granger cause Y or/and Y Granger cause X we carry out an F-test on the joint significance of σ_j and α_i respectively.

Therefore, we proceed with the test thus:

$$H_0 : \sum_{j=1}^m \sigma_j = 0 \text{ and } H_0 : \sum_{i=1}^m \alpha_i = 0 ,$$

respectively

We reject the H_0 , if the calculated $F^* > F_{n-k}^m$ (k is the number of parameters estimated in equations (6) and (7), n is the number of observations. Otherwise we do not reject H_0 . We may also use the Probability value of the F-statistic to make a decision based on the significance level, usually 1%, 5% and 10% respectively.

4. Results and Discussions

4.1 Result of the Unit Root tests:

Table1: Result of the Augmented Dickey Fuller (ADF) Unit Root Test

Variable		Augmented Dickey Fuller (ADF) Unit Root Test				Conclusion
		One-lag model		Two-Lag Model		
		Constant	Constant and Trend	Constant	Constant and Trend	
lnRGDP	level	-3.109710	-3.274181	-3.109710	-3.274181	I(1)
	Δ level	-6.484295**	-6.262695**	-6.484295**	-6.262695**	
lnFD	level	-1.808691	-2.410635	-1.808691	-2.410635	I(1)
	Δ level	-4.740425**	-4.600725**	-4.740425**	-4.600725**	
lnCPSF	level	-1.430829	-0.726938	-1.430829	-0.726938	I(1)
	Δ level	-3.282643**	-3.539578**	-3.282643**	-3.539578**	
lnIRS	level	-2.481278	-2.587062	-2.481278	-2.587062	I(1)
	Δ level	-5.064350**	-4.957440**	-5.064350**	-4.957440**	
lnRER	level	-2.528840	-2.017265	-2.528840	-2.017265	I(1)
	Δ level	-2.479880**	-2.934985**	-2.479880**	-3.604487**	
ln INF	level	-2.630849	-2.617955	-2.630849	-2.617955	I(1)
	Δ level	-5.455647**	-5.392609**	-5.455647**	-5.392609**	

Note: (*) and (**) denote 1 % and 5% significance level respectively, Δ =first difference and I (1) means order of integration

The ADF unit root test is performed under the null hypothesis that unit root exist against the alternative hypothesis that unit root does not exist. The ADF unit root test in table 1, above shows

that all the variables are not stationary in level but stationary at first difference, implying that all the variables are integrated of order one, denoted as I(1).

4.2 Co-integration Result

Having found the series to confirm the existence of unit root and are stationary at first difference I (1), the next logical thing to do is to test for long-run equilibrium relationship between the dependent variable and the explanatory variables using the Co-integration Regression Augmented Dickey Fuller (CRADF) test.

Table 2: Result of the (CRADF) Test.

Null Hypothesis: E has a unit root

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-4.129359	0.0062
Test critical values:		
1% level	-3.886751	
5% level	-3.052169	
10% level	-2.666593	

*MacKinnon (1996) one-sided p-values.

The test-statistic on E (-1) is **-4.129359**, with 20 included observations at 0.05 Mackinnon (1991) critical values is **-3.6585**. The calculated value of the test statistic is less-than the critical value rejecting the null hypothesis of no co-integration; the series are co-integrated. The residuals as shown in appendix figure 3 crosses the zero line so often (the residuals are stationary), confirming also the presence of co-integration. The presence of co-integration implies that long run equilibrium relationship exists between the dependent variables and the explanatory variables. Hence the hypothesis that long-run equilibrium relationship between financial sector development and economic growth exists in Yemen is supported.

4.3 Result of the Error Correction Model

Table 3: Result of the Error Correction Model (ECM)

Dependent Variable: DLNRGDP

Variable	Coefficient	Std. Error	t-Statistic	Prob
C	-0.165995	0.097248	-1.706921	0.1387
DLNFD	0.354647	0.159850	2.218624	0.0683***
DLNCPSF	0.039200	0.014572	2.690173	0.0360**
DLNIRS	-0.671114	0.250445	-2.679681	0.0366**
DLNRER	-0.012202	0.003939	-3.097661	0.0101**
DLNINF	-0.672147	0.210586	-3.191801	0.0188**
DLNRGDP(-1)	-1.826976	0.366840	-4.980309	0.0025
DLNFD(-1)	0.280253	0.110782	2.529779	0.0231
DLNCPSF(-1)	0.359798	0.195400	1.841340	0.0821
DLNIRS(-1)	-0.008892	0.003265	-2.723624	0.0157

DLNRER(-1)	-0.035680	0.016543	-2.156745	0.0540
DLNINF(-1)	-0.035503	0.012095	-2.935328	0.0102
E(-1)	-0.703419	0.137058	-5.132278	0.0001*

Note: (*); (**) and (***) denote 1%; 5% and 10% significance level respectively.

R-squared= 0.777194; Adjusted R-squared= 0.655664 DW: 2.120525; Prob (F-statistic) = 0.004165

The result in table 3 above, shows that CPSF and FD have positive effect on RGDP and are statistically significant at the 5% and 10% respectively, while IRS, RER and INF are found to have a negative relationship on RGDP and significant at 5% level respectively. This indicates that high inflation raises the cost of production and reduces returns from investment and thus impact negatively on growth. Other things being equal, after adjustment for the degrees of freedom, the result suggest that about 65.56% of the variation in RGDP is explained by variation in the independent variables. The coefficient of the error correction term E (-1) is -0.703419 as measure of the speed of adjustment which is negative and statistically significance, it means that during periods of negative shocks and disequilibrium errors to the system, the variables increases less rapidly than consistent and thus moving their lagged values below the long run steady-state path. Due to the negative of the coefficient of the EC_{t-i} term, the total effect is to bring back the changes of variables to their long run trajectory as determined by the system. This implies that for any drift away from the long run equilibrium in previous years, convergence to the equilibrium is corrected by 70.3%. That is approximately 70.3% of the error is corrected every year in the event of shocks in the system

4.4 Result of the Granger Causality Test

Table 4: Result of the Granger Causality Tests

Hypothesis	No. of lags	F-Stat	Prob.	Conclusion
DLNFD does not Granger Cause DLNRGDP	2	5.35561	0.0201**	Bi-directional Relationship
DLNRGDP does not Granger Cause DLNFD	2	4.68222	0.0277**	
DLNCPSF does not Granger Cause DLNRGDP	2	3.32416	0.0658**	Bi directional Relationship
DLNRGDP does not Granger Cause DLNCPSF	2	12.7692	0.00070*	
DLNIRS does not Granger Cause DLNRGDP	2	0.37088	0.6972	Unidirectional Relationship
DLNRGDP does not Granger Cause DLNIRS	2	4.46905	0.03155**	
DLNRER does not Granger Cause DLNRGDP	2	11.6602	0.0012**	Bi-directional Relationship
DLNRGDP does not Granger Cause DLNRER	2	3.17357	0.0730***	
DLNINF does not Granger Cause DLNRGDP	2	0.20372	0.8182	Unidirectional Relationship
DLNRGDP does not Granger Cause DLNINF	2	5.19445	0.0219**	

Note: (*), (**) and (***) indicates that the null hypothesis is rejected at 1%, 5% and 10% level of significance respectively. The appropriate lag length is selected based on the Schwarz Information Criteria (SIC), the test is performed on the stationary data series.

The result of the Granger causality test in table 4, above indicates a bi-directional relationship between FD and RDGP, CPSF and RGDP, RER and RDGP at the level of their p-values. There exist a unidirectional relationship between IRS and RGDP; the causation runs from RGDP to

IRS at 5% level of significance. Causation runs from RGDP to INF at the 5% level of significance and does not run in the reverse sense. In general, the Granger causality test result demonstrates a fairly strong evidence of a bi-directional relationship between financial



sector development and the growth of output. Hence, confirming the hypotheses that causality exists between financial sector development and economic growth in Yemen. This could also be seen from the series that there is a strong speed of adjustment as it can correct about 70.3% convergence to equilibrium following a shock to the system.

5. Conclusion

Slow growth episodes has been the case in most MENA countries, most authors and policy makers are searching for ways to enhance growth. The financial sector is one of the identified sources. Hence, the links between the two sectors, financial and real have been a major area for consideration by researchers. Findings of the current literature are mixed and inconclusive. To the best of our knowledge, in the context of Yemen economy there are some studies that have attempted to find out the relationship between macroeconomic policies and economic growth in general, but there is no specific study on how financial sector development can impact on the economic growth. These contradictory conclusions emerging from the empirical literature and coupled with the weak growth performance of the Yemen economy motivates this present study. Using data from 1991-2011, we investigate the link between financial sector development and economic growth in Yemen.

The hypothesis that long-run equilibrium relationship exists between financial sector development and economic growth in Yemen is supported with the use of the Co-integration Regression Augmented Dickey Fuller (CRADF) test. Our results also confirmed the hypothesis that causality exists between financial sector development and economic growth using the Granger Causality test. There is strong evidence of a bi-directional relationship between financial sector development and economic

growth. This could also be seen from the series that there is a strong speed of adjustment as it can correct about 70.3% convergence to equilibrium following a shock to the system. This result is consistent with the study by Mckinnon (1973) and Shaw (1973), Gelb (1988) and Patrick (1976) that causation of finance and growth could be bi-directional or unidirectional (Supply-leading or demand leading impetus).

Our findings also reveal that domestic credit to the private sector has a positive effect on the growth of output; this implies that an increase in the domestic credit to the private sector encourages private investment and hence increases growth. High interest rate margin as observed in the study impacts negatively on growth. This signals that the banking sector in Yemen is relatively uncompetitive. With an uncompetitive banking sector, the cost of capital is very high and therefore slowing down investment and growth. To this end, Government should strive to attain sound macroeconomic climate, loan administration capacity, competitive interest rate spread and compliance with financial institutions legal instruments to make the financial sector more responsive to the needs of the Yemen populace. Therefore, a more efficient financial system could positively impact on economic growth and hence increasing employment and growth. Since, economic growth is conventionally expected to reduce poverty.

Despite data limitation, our findings have an important implication not only for policy makers in Yemen but also for development organizations that are assisting in the growth process of Yemen and other MENA countries. On this basis, we look forward to future study on growth issues with a view to further provoke policy discourse, such study could be the nexus between foreign direct investment and economic growth in the MENA countries.



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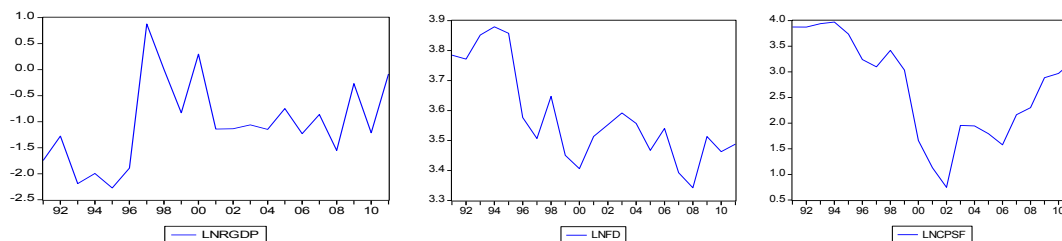
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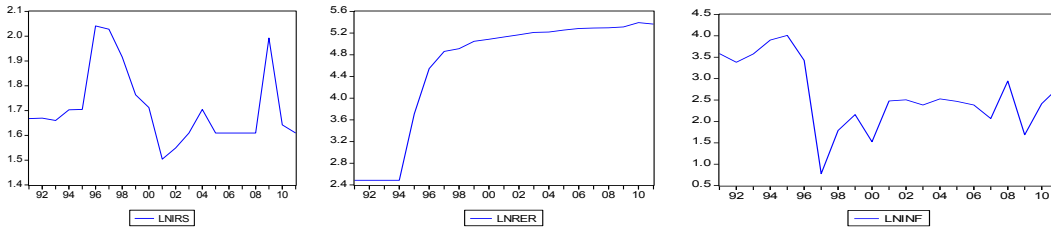
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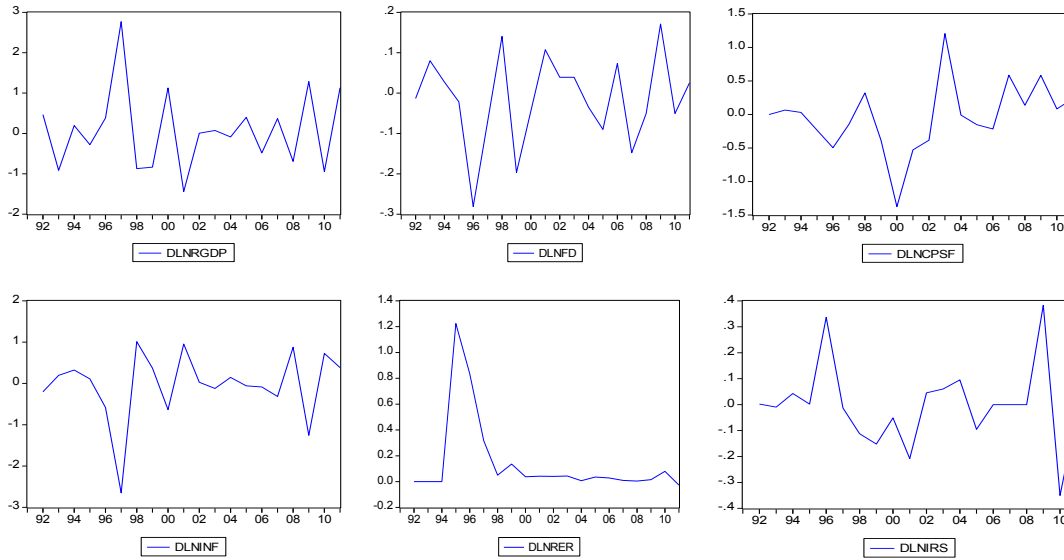
Appendix

Graphs of Level/Figure 1: Non- Stationary





Graphs of First Difference/ Figure 2: Stationary



Graph of the Residuals/ Figure 3, are Stationary, suggesting evidence of Co-integration among the dependent and independent variables

