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# Financial development and economic growth in an oil-rich economy:

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# Financial development and economic growth in an oil-rich economy: The case of Saudi Arabia[*]

Nahla Samargandi[†], Jan Fidrmuc[‡] and Sugata Ghosh[§]

May 2013

## Abstract

We investigate the effect of financial development on economic growth in the context of an oil-rich economy. In doing so, we allow for the effect of financial development to be different for the oil and non-oil sectors of the economy in the long–run. Using the Autoregressive Distributed Lag (ARDL) bounds test technique; we find that financial development has a positive impact on the growth of the non-oil sector in Saudi Arabia. In contrast, its impact on total GDP growth is negative but insignificant.

Keywords: Financial Development; Economic Growth; ARDL Method, Saudi Arabia.

## I. Introduction

In this paper, we explore the link between financial development and economic growth for an oil-rich economy, Saudi Arabia. Countries whose economies are dominated by oil or other natural resources possess specific features not shared by industrialized or developing economies. Large share, often lion's share, of economic activity is represented by resource extraction, characterized by low added value and often by high degree of state regulation. Moreover, economic dynamics are predominantly determined by the prices of natural resources at world markers rather than by domestic economic developments. To the best of our knowledge, our paper is one of the first studies to specifically consider the role that financial development plays in a resource-dependent economy, and the potentially different effects that it may have on the resource-extraction and conventional sectors of such an economy.

The literature on the relationship between financial development and economic growth is voluminous. There is, however, yet no consensus view on either the nature of this relationship or the direction of causality. Four different hypotheses have been proposed.

The first view is that financial development is supply–leading, in the sense that it fosters economic growth by acting as a productive input. This view has been supported theoretically and empirically by a large number of studies. One of the first contributions is Schumpeter (1911) who argues that the services provided by financial intermediaries and increases the competition in the financial sector, which in turn promotes economic growth. Similar ideas are put forward by, among others, Galbis (1977), Fry (1978), Goldsmith (1969), Greenwood and Jovanovic (1990), Thakor (1996), and Hicks (1969). They view financial development as a vital determinant of economic growth, which increases savings and facilitates capital accumulation and thereby leads to greater investment and growth. Empirically, several studies support the supply–leading view. A prominent study is King and Levine (1993). They study 80 countries by means of a simple cross-country OLS regression. Their findings imply that financial development is indeed important determinant of economic growth. Similar results have been found in a study by Chistopoulos and Tsionas (2004), who examine the long-run relationship between bank development and economic growth for 10 developing countries. They utilize panel cointegration techniques and find a uni-directional relationship going from financial development to economic growth. Atje and Jovanovic (1993) assess the role of the stock market on economic growth and find that the volume of transactions in the stock market has a fundamental effect on economic growth. Subsequent studies confirm these results by focusing on both market-based and bank-based measures of financial development (see for example, Levine and Zervos, 1998, and Kunt and Maksimovic, 1998).

The second view is demand-following. In contrast to the previous position, Robinson (1952) argues that financial development follows economic growth, which implies that as an economy develops the demand for financial services increases and as a result more financial institutions, financial instruments and services appear in the market. A similar view is expressed by Kuznets (1955), who suggests that as the real side of the economy expands and approaches the intermediate stage of growth, the demand for financial services begins to increase. Hence, according to this view, financial development depends on the level of economic development rather than the other way around. This view has been empirically confirmed by studies such as, for example, Al-Yousif (2002) and Ang and McKibbin (2007).

The third view is one of bidirectional causality. Accordingly, there is a mutual or two-way causal relationship between financial development and economic growth. This argument is put forward by Patrick (1966) who was one of the first researchers to posit that the development of the financial sector (financial deepening) is as an outcome of economic growth, which in turn feeds back as a factor of real growth. Similarly, a number of

Beck (2011) argues that the ambiguity in the relationship between financial development and economic growth in oil-rich (or natural-resource-rich) countries in the previous literature reflects the general belief that economic growth is driven by different forces in these countries and that the financial sector has a different structure and plays a different role there. Nevertheless, his findings indicate, contrary to Nili and Rastad (2007), that there is in fact no significant difference in the impact of financial development on economic growth between both resource-based countries and non-resource based countries. However, when he assesses the level of countries' reliance on natural resources, he finds that countries that depend more on the exports of natural resources tend to have underdeveloped financial systems. This is despite the fact that banks in resource-based economies tend to display higher profitability and are more liquid and better capitalized. However, they offer less credit to the private sector, which he attributes to the incidence of financial repression in resource-based countries. Therefore, he concludes that resource-based countries can be subject to the natural resource curse in financial development, and suggests that further work is needed on this issue.

We seek to contribute to this debate by considering the case of a resource-dominated country: Saudi Arabia.[6] The economy of Saudi Arabia is heavily dependent on oil revenue. Recently, however, the government has been promoting diversification towards the non-oil sector and reducing the country's dependence on the petroleum sector. Since the

[6]Substantial literature focuses on single country studies, e.g Murinde and Eng (1994) for Singapore; Abu-Bader,et al (2008) for Egypt; Lyons and Murinde (1994) for Ghana; Odedow(a; 48Tr)-5-5.8(e ()8a; 48Tr Nigeria; Agung and Ford (1998) for Indonesia ; Wood (1993) for Barbados; Khan, et al (2005) for Pakistan; Hondroyiannis , et al (20058Te9or Greece; Ang, et al (2008Te9or Malaysia; Majid (20078Tefor Thailand; Mohamad (20088Tefor Sudan; Singh (2008)for India; Safdari et al (2011) for Iran; Thangavelu, et al (2004) for Australia; Muhsin and Pentecost (2000) for Turkey; Qi Liang,et al (20068Tefor China; Ghatak(19978Tefor SLad Al-Malikawi et al (2012) for UAE.

## II. Overview of the Saudi Economy and its Financial Sectors

Saudi Arabia's economy depends heavily on the oil sector. The country is the world's leading exporter of petroleum and a very prominent member of the OPEC. The oil sector contributes to about 45 percent of the total GDP and 90 percent of the total export earnings. Besides oil, the Saudi economy is also dependent on migration, as roughly 6 million overseas workers work in the oil and service sectors. In order to reduce the dependence on the oil sector, the government has, over the last couple of decades, been trying to diversify the economy by promoting the non-oil sector. Efforts have been made to diversify into power generation, telecommunications, natural gas exploration, and petrochemical sectors. What is more, in order to foster economic growth, the government has recognized the important role of the financial sector in mobilising savings and channeling funds to economic activities. To this effect, it has been promoting the development of an efficient banking system, well-developed financial markets and comprehensive and competitive insurance services.

There have been several signs that the economy has been switching from the oil to the non-oil sector over the last four decades.[7] During the 1970s, the share of the non-oil sector in overall GDP was very low, from 30% to 37%. However, at the beginning of the 1980s, the Saudi economy experienced a rapid shift in favour of the non-oil sector at the expense of the oil sector. In 1985, the non-oil output peaked at 77% of GDP. Thereafter, its share fluctuated between 60% and 72% during the following period (1986-2010).

Choudhury and Al-Sahlawi (2000) see this significant growth of the non-oil sector could as a success of the emphasis on diversification made in the fourth development plan

[7] The oil sector refers to the production activity relating to the extraction and supply of crude oil. The non-oil activities include finance, trade, government services, construction, utilities, natural gas and petroleum-processing industries.

shareholders while the rest are owned by a mix of Saudi and foreign shareholders (Ariss, et al., 2007). Table 1 shows some selected indicators of the banking sector. The ratio of liquid liabilities to GDP (M3/GDP) has increased moderately from 2005 to 2010, though it has fallen somewhat in 2008 and 2010 compared to the previous years. A higher liquidity ratio means that the banking system has grown in size. The ratio of private sector credit to GDP has followed the same trend as the liquid liabilities to GDP ratio. Table 1 also shows that total bank assets have been increasing constantly over the years.

The Saudi commercial banks have expanded the amount of investment and consumer lending. The private sector in Saudi Arabia remains relatively inflation, openness to trade and various measures of financial development (discussed in greater detail below) as our main variables of interest.[8] However, when including all variables in the regression, several turned out to be insignificant. We, therefore, proceeded to omit the insignificant explanatory variables, one by one, until we were left with a model that contained only significant variables: the oil price (OILP), trade openness (TRD) and financial development (FD).[9] The fact that investment dropped out is particularly puzzling: it is typically a robust determinant of economic growth in most studies, and therefore it is surprising that it fails to feature significantly as a determinant of Saudi growth. This may be due to the overwhelming dominance of the oil sector in this country. It may also reflect the fact that a large fraction of investment in Saudi Arabia is related to oil exploration and thus may affect growth only with a substantial lag, likely to be several years.

We, therefore, estimate a model that includes only a relatively narrow set of core variables alongside our main variable of interest: financial development. This is in line with the literature arguing against controlling for a relatively extensive list of explanatory variables: the resulting coefficients then often depend crucially on the set of specific remaining variables included (see the discussion in, among others, Levine and Renelt, 1992, and Woo, 2009).

*Construction of financial development variables: Principal component analysis (PCA)*

We collected information on the following three indicators of financial development:

1. The ratio of broad money (M2)[10] to nominal GDP.
2. The ratio of liquid liabilities (M3)[11] to the nominal GDP.

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[8] We also sought to include some measure of human capital but were unable to do so because of missing values.

[9] This approach is equivalent to implementing the general-to-specific procedure.

[10] M2 = M1 (currency outside banks + demand deposits) + time and saving deposits.

[11] M3= M2 + other quasi monetary deposits.

3. The ratio of credit to private sector to nominal GDP.

We follow Ang and McKibbin (2007) in constructing a single measure of financial development by using principal component analysis. The justification for doing this is two-fold. First, it addresses the problem of multicollinearity, or the high correlation between the various financial development indicators. Second, there is no general consensus as to which measure of financial development is the mo more than two cointegrated variables under consideration (see, Asteriou and Hall (2011); Ang (2010)). Another shortcoming of this method is in its implementation: in order to obtain the long-run equilibrium relationship, we need to estimate the Ordinary Least Squares (OLS) regression as a first step on levels of the variables. This procedure, as pointed out by Banerjee et al. (1986), may generate a substantial bias owing to the omission of dynamics, and this can undermine the performance of the estimator. Also, the two-step residual-based procedure uses the generated residual series in the first step to estimate a new regression model in the second stage, in order to see whether the residual series is stationary or not. Hence, the error introduced in the first step is carried forward into the second step (Enders, 2004; Asteriou and Hall, 2011).

The Johansen method, which is known as a system-based approach to cointegration, is considered to be a superior method over the Engle and Granger method, and offers a solution in the case of having more than two variables and multiple cointegration vectors that might exist between the variables. Also, the Johansen approach mitigates the omitted lagged variables bias that affects the Engle and Granger approach by the inclusion of lags in the estimation. Even so, the advantages of the Johansen method can be subject to criticism. The first drawback is the sensitiveness of the results to the optimal number of lags included in the test (Gonzalo, 1994). The second is that if there are more than one cointegrating vectors, it is often hard to interpret each implied economic relationship and yo find the most appropriate vector for the subsequent test (Ang, 2010).

Both the Engle-Granger and Johansen techniques are criticised on the grounds that the validity of these methods requires that all the variables be integrated of order one, e.g. I(1). They cannot be employed, therefore, if we have a mixture of I(0) and I(1) variables, as in our case (see below).

In equation (1), Y is the real gross domestic product per capita, X1 stands for financial development, X2 is the oil price, X3 is trade openness, and ε is the error term.

Using the ARDL approach we estimate three models where the first model relates real GDP per capita (GDP) = f (Financial Development (FD), Oil Price (OILP), Trade Openness (TRD)), the second model is real GDP per capita of Non Oil Sector (GDPN) = f(Financial Development (FD), Oil Price (OILP), Trade Openness (TRD)), and the third model is real GDP per capita of Oil Sector (GDPO) = f(Financial Development (FD), Oil Price (OILP), Trade Openness (TRD)).

*Estimation procedure*

We first estimate equation (1) using OLS and then conduct the Wald Test or F- test for joint significance of the coefficients of lagged variables for the purpose of examining the existence of a long-run relationship among the variables. We test the null hypothesis, ($H_0$): ᛏ ٻ ᛏ ٻ ᛏ ٺ ᛏ ٿ π, that there is no conintregration among the variables, against the alternative hypothesis ($H_a$): ᛏ ٻ ᛏ ٻ ᛏ ٺ ᛏ ٿ π

In this process, we use the SIC criteria for selecting the appropriate lag length of the ARDL model for all four variables under study. Finally, we use the error correction model to estimate the short run dynamics:

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*Cusum and cusumsq test (Stability Test)*

We perform two tests of stability of the long-run coefficients together with the short run dynamics, following Pesaran (1997), after estimating the error correction model: the cumulative sum of recursive residuals (CUSUM) and the cumulative sum of squares of recursive residuals (CUSUMSQ) tests.

## V. Results and Discussion

*Unit-root test*

Prior to testing for cointegration, we conduct a test of the order of integration for each variable using the Augmented Dickey-Fuller test (Table 4). Even though the ARDL framework does not require pre-testing variables, the unit root test could indicate whether or not the ARDL model should be used. As can be seen from Table 4, only some of the variables, in particular real GDP per capita in the non-oil sector (GDPN), real GDP per capita in the oil sector (GDPO) and the oil price (OILP), are stationary at the 5 percent or 10 percent significance level, whereas all variables are stationary after first differencing. Hence, the results of unit root test demonstrate that the ARDL model is more appropriate to analyze the data than the Johansen cointegration model.

*Cointegration test*

The calculated *F*-statistics for the cointegration test are displayed in Tables 5, 9 and 13. The *F*-statistic for the first model (7.5803, Table 5) is higher than the upper bound critical value at the 1 percent level of significance, using restricted intercept and no trend. This implies that the null hypothesis of no cointegration cannot be accepted, therefore there is a cointegrating relationship among the variables. Through normalization process we find that there is cointegration at 5 % when financial development and the oil price are the dependent variables but not when we consider openness to trade. The same procedure has been applied to analyze the other two models (for the oil and non-oil sectors). The results suggest the presence of cointegration between GDPN and all other explanatory variables, and also cointegration between GDPO and the other variables.

*Long- run impact*

The empirical results are reported in Tables 6, 10 and 14. They shows that trade openness has positive and significant effect on overall economic growth as well as on the growth of both oil and non-oil sectors. This result is consistent with theoretical and empirical predictions. In addition, the oil price has a positive and significant impact on overall GDP growth but an insignificant impact on the non-oil sector in the long-run.

Financial development has a negative but insignificant impact on economic growth, indicating that the Saudi economy has not benefitted from financial development. This result is in line with Barajas, Chami and Yousefi (2012), who find that financial development has lower if not negative effect on economic growth in oil-rich anong the inancial d(Af3 TDn 0 MENAw(counD.

development on economic growth.  Jalil and Ma (2008), similarly, argue that inefficient allocation of resources by banks coupled with the absence of favourable investment environment in the private sector slow the overall economic growth in China. The findings of Jalil and Mia would be applicable to Saudi Arabia where, as in China, most economic decisions are directed by the government. Barajas et al. (2011) argue that the impact of financial deepening on economic growth disappears in the case of an oil-based economy like Saudi Arabia. The findings of our research are in line also with Ang and McKibbin (2006) who found no evidence of economic improvement due to expansion of financial sector in Malaysia. Ang and McKibbin suggest that the returns from financial development depend on the mobilization of savings and allocation of funds to productive investment projects. But due to information gaps, high transaction costs and improper allocation of resources, the interaction between savings and investment and its link with economic growth is not strong in developing countries. According to Beck (2011), the existence of natural resource curse in financial development might be another reasons for this insignificant impact of financial development on growth in oil-rich economies .

In contrast, the effect of financial development (FD) on the non oil sector in Saudi Arabia is positive and statistically significant at 10%. The magnitude of this impact is not sufficient to warrant a positive relationship for the overall economy since the non-oil sector constitutes only a relatively small part of the Saudi economy. This finding is consistent with Nili and Rastad, (2007) who find that financial markets in

In contrast, the third model shows that FD does not have any impact on the oil sector of Saudi Arabia. Since the oil sector is exclusively controlled by the government, it is not surprising that financial development does not significantly contribute towards its growth.

*Short rum impact and adjustment*

The coefficients of the error correction model for all three specifications are presented in Tables 7, 11 and 15. The negative signs of each coefficient of the ECM variable reveal that short-run adjustment, which occurs at a high speed in the negative direction, is statistically significant. Moreover, this is an indication of cointegration relationship among GDP (both oil and non-oil), financial development, oil price, and trade openness. The values of ECM coefficients strongly suggest that the disequilibrium caused by previous year's shocks dissipates and the economy converges back to the long-run equilibrium in the current year (see Dara and Sovannroeun, 2008; and Hossein, 2007).

*Diagnostic test*

The overall goodness of fit of the estimated models shown in Tables 8, 12 and 16 is quite high, with $R^2$ values of 96%, 99% and 77% for the first, second and third model, respectively. This is not surprising, given that the ARDL model includes the lagged dependent variable. We applied a number of diagnostic tests to the ARDL model. We found no evidence of serial correlation, multicollinerarity, and error in the functional form, but found heteroskedasticity in model 2 and model 3 (Tables 12 and 16). However, as Shrestha and Chowdhury (2005) and Fosu and Magnus (2006) point out, it is natural to detect heteroskedasticity in the ADRL approach, since the model mixes time series data integrated of order I(0) and I(1). Figure 1, 2 and 3 show the CUSUM and the CUSUMSQ stability test results to the residuals of equation (1): the CUSUM and CUSUMSQ remain within the critical boundaries for the 5%

economy. Banking plays an important role in industrialized and agricultural economies alike, in that it improves allocation of resources to firms and helps these firms stay afloat until their goods are sold. This role is less important when the economy is dominated by extraction of a highly liquid (in financial sense) and easily marketable commodity.

Our results suggest, nevertheless, the Saudi non-oil sector is favourably affected by financial development. Therefore, if the diversification of the Saudi economy continues, we can anticipate that financial development will play a more prominent role in the country's overall economic performance in the future, provided the expansion of the non-oil sector is not hampered by the underdevelopment of the financial sector.

## References


Atje, Raymond and Boyan Jovanovic. (1993). Stock Markets and Development. *European Economic Review* : 37, 632-640.

Abu-Bader, S., and Abu-Qarn, A.S. (2008). Financial Development and Economic Growth: The Egyptian Experience. *Journal of Policy Modeling*, 30 (5), 887–898.

Albatel, A.H. (2000). Financial Development and Economic Growth in Saudi Arabia. *Journal of Economic & Administrative Sciences*, 16, 162-188.

Al-Hassan, A., Khamis,M. and Oulidi.N. (2010). The GCC Banking Sector: Topography and Analysis, International Monetary Fund, IMF Working Paper.

Al-Malkawi, H., and Abdullah, N. (2012). Finance-Growth Nexus: Evidence from a Panel of MENA Countries. *International Journal of Economics and Finance*, 4 (5), 129-139.

Al-Yousif, Y. K. (2002). Financial Development and Economic Growth: Another Look at the Evidence from Developing Countries. *Review of Financial Economics*, 11(2), 131–150.

Ang, J. B., and McKibbin,W.J. (2007). Financial development and Economic Growth: Evidence from Malaysia. *Journal of Development Economics*, 84, 215-233.

Ang,James B ,(2010) financial development and economic growth in Malaysia. Routledge Studies in the Growth Economies of Asia

Agung, F. and Ford, J. (1998). Financial Development, Liberalization and Economic Development in Indonesia, 1966-1996: Cointegration and Causality. *University Of Birmingham, Department of Economics Discussion Paper No: 98-12.*

Asterious, Dimitrios and Stephen Hall, 2011, Applied Econometrics: A Modern Approach, Palgrave Macmillan. Second edition.

Balajas, A., Chami, R., and Yousefi, R.S. (2011). The Finance-Growth Nexus Re-Examined: Are There Cross-Region Differences? *IMF Working Paper*, 48(3).

Barajas, R. Chami and R. Yousefi. (2012). The Finance and Growth Nexus Re-examined: Are There Cross-Region Differences? Mimeo.

Beck, Thorsten. (2010). Finance and Oil: Is There a Resource Curse in Financial Development?. *European Banking Centre Discussion Paper No. 2011-004*. (Tilburg, The Netherlands: Tilburg University).

Berthelemy, J.C., and Varoudakis, A. (1997). Economic Growth, Convergence Clubs, and the Role of Financial Development. *Oxford Economic Papers* 48, 300–328.

Buffie, E. F. (1984). Financial Repression, the New Structuralists, and Stabilization Policy in Semi-Industrialized Economics, *Journal of Development Economics*, 14, 305-22.

Choudhury, M.A and Al-Sahlawi, M. A. (2000).Oil and Non-oil Sectors in the Saudi Arabian Economy. *OPEC Review*, 24 (3), 235–250.

Christopoulos, D. K. and Tsionas, E. G. (2004) 'Financial development and economic growth: Evidence from panel unit root and cointegration tests', *Journal of Development Economics*, 73, 55-74.

Demirguc-Kunt, Asli and Vojislav Maksimovic. (1998). Law, finance and firm growth, *Journal of Finance*, 53(6), 2107-2137.

Dara, L. and Sovannroeun, (2008) "*The Monetary Model of Exchange Rate: Evidence from the Phillipines using ARDL Approach*", Munich Personal RePEc Archive (MPRA).

De Gregorio, J., and Guidotti, P. (1995). Financial Development and Economic Growth. *World Development*, 23, 433-448.

Demetriades, P. and Law, S.H. (2006). Finance, Institutions and

Inder, B. (1993). Estimating Long-Run Relationship in Economics: A Comparison of Different Approaches. *Journal of Econometrics,* 57: 53-68.

Jalil, A., and Ma, Y. (2008). Financial Development and Economic Growth: Time Series Evidence from Pakistan and China. *Journal of Economic Cooperation*, 29(2), 29-68.

King, R. G. and Levine, R. (1993). Finance and growth: Schumpeter Might Be Right. *Quarterly Journal Economics*, 108: 717-37.

Kenny, C., and Williams, D. (2001). What Do We Know about Economic Growth? Or, Why Don't We Know Very Much? *World Development*, 29(1), 1–22.

Khan, M. A., Qayyum, A. and Saeed, A. S. (2005). Financial Development and Economic Growth: The Case of Pakistan", *The Pakistan Development Review 4. 44, 819-837.*

Krugman, P.R. (1979). Increasing Returns, Monopolistic Competition and International Trade. *Journal of International Economics*, 9 (4), 469-479.

Krugman, P.R. (1980). Scale Economies, Product Differentiation, and the Pattern of Trade. *American Economic Review*, 70 (5), 950-959.

Kuznets, S. (1955). Economic Growth and Income Inequality. *The American Economic Review*, 45(1), 1–28.

Levine, Ross and Zervos, Sara (1998), "Stock Markets, Banks, and Growth," *American Economic Review*, 88(3), 537-558.

Levine, R. and Renelt, D. (1992), "A Sensitivity Analysis of Cross-Country Growth Regressions," *American Economic Review* 82 (4), 942-963.

Lyons, S.E. and Murinde, V. (1994) .Cointegration and Granger-Causality Testing of Hypotheses on Supply-Leading and Demand-Following Finance. *Economic Notes*. 23 (2), 308-316.

Loayza, N. V., and Ranciere, R. (2006). Financial Development, Financial Fragility, and Growth. *Journal of Money, Credit and Banking*. 38(4), 1051-1076.

Lucas, R. (1988). On the Mechanics of Economic Development. *Journal of Monetary Economics* 22, 2-42.

Majid, M. S. (2007). Does Financial Development and Inflation Spur Economic Growth in Thailand? *Chulalongkorn Journal of Economics*, *19*, 161–184.

McKinnon R. (1973) Money and Capital in Economic Development (Washington: The Brookings Institute).

Mohamad, S. E. (2008). Finance-Growth Nexus In Sudan: Empirical Assessment Based on an Application of the Autoregressive Distributed Lag (ARDL) Model. *Working*

Pesaran, M. H., Shin, Y., and Smith, R. J. (2001). Bounds Testing Approaches to the Analysis of Level Relationships. *Journal of Applied Econometrics*, 16, 289-326.

Ram, R. (1999). Financial Development and Economic Growth: Additional Evidence. *The Journal of Development Studies*, 35 (4), 164-174.

Qi, L. and Teng, J. Z. (pro.0nt S1cs

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*Finance*, 20, 917-948.

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Tables

Table 1: Selected Indicators of Banking Sector

| Year | M3/GDP | PRIVATE/GDP | Total Bank Asset |
|---|---|---|---|
| 2005 | 46.8218 | 36.8644469 | 759075 |
| 2006 | 49.4604 | 35.64138057 | 861088 |
| 2007 | 54.7463 | 40.05913986 | 1075221 |
| 2008 | 52.0185 | 41.12532216 | 1302271 |

Table 3: Principal Components Analysis

Number of Obs = 41 Number of comp. = 3

| Component | Eigenvalue | Difference | Proportion | Cumulative |
|---|---|---|---|---|
| Comp1 | 2.912 | 2.840 | 0.971 | 0.971 |
| Comp2 | .072 | .0569 | 0.024 | 0.995 |
| Comp3 | .015 | . | 0.005 | 1.000 |

Table 4: Unitroot Test

| Variables | ADF test | | ADF test | |
|---|---|---|---|---|
| | In level I(0) | | First difference I(1) | |
| | Intercept | Intercept & trend | Intercept | Intercept &trend |
| GDP | -2.598 | -3.078* | -2.997** | -3.463* |
| GDPN | -3.15** | -3.371* | -2.47 | -2.82 |
| GDPO | -2.659* | -3.450* | -5.335*** | -5.394*** |
| FD | -0.250 | -2.621 | -6.999*** | -7.004*** |
| OILP | -2.631* | -2.401 | -6.028*** | -6.022*** |
| TRD | -1.555 | -1.491 | -9.097*** | -9.001*** |

Note: ** at 5%, ***at 1% * at 10%

Table 5: Result from Bound test

| Dep. Var. | SIC Lag | F-statistic | Probability | Outcome |
|---|---|---|---|---|
| $F_{GDP}$(GDP\|FD, OILP, TRD) | 1 | 7.580 | 0.000*** | Cointegration |
| $F_{FD}$(FD\|GDP, OILP, TRD) | 1 | 3.636 | 0.015** | Cointegration |
| $F_{OILP}$(OILP\| FD, GDP, TRD) | 1 | 3.355 | 0.021** | Cointegration |
| $F_{TRD}$(TRD\| FD, GDP, OILP) | 1 | 1.254 | 0.308 | No Cointegration |

Note: ** at 5%, ***at 1% * at 10%

Table 6: Estimated Long Run Coefficients using the ARDL Approach

ARDL(2,0,1,1) selected based on Schwarz Bayesian Criterion, Dependent variable is GDP

| Regressor | Coefficient | Standard Error | T-Ratio | Probability |
|---|---|---|---|---|
| C | -6.950 | 12.390 | -.560 | .579 |
| FD | -.033 | .035 | -.962 | .342 |
| OILP | .133*** | .023 | 5.690 | .000 |
| TRD | 2.14*** | .088 | 24.310 | .000 |

Note : ** at 5%, ***at 1% * at 10%

Table 7: Error Correction Representation for the Selected ARDL Model

ARDL(2,0,1,1) selected based on Schwarz Bayesian Criterion. Dependent variable is dGDP

| Regressor | Coefficient | Standard Error | T-Ratio | Probability |
|---|---|---|---|---|
| ΔFD | -0.004 | 0.004 | -.993 | 0.327 |
| ΔOILP | 0.001 | 0.004 | .252 | 0.802 |
| ΔTRD | 0.118* | 0.058 | 1.74 | 0.089 |
| ecm(-1) | -0.128*** | 0.023 | -5.47 | 0.000 |

Note : ** at 5%, ***at 1% * at 10%

Table 8: ARDL-VECM Model Diagnostic Tests

$R^2$=0.96, Adjusted $R^2$=0.95

Serial Correlation ꭗ̱ ٻ ρ =.001[0.972]		Normality ꭗ̱ ٻ ς =1.687[0.43]

Functional Form ꭗ̱ ٻ

Table 9: Result from Bound test

| Dep. Var. | SIC Lag | F-statistic | Probability | Outcome |
|---|---|---|---|---|
| $F_{GDPN}$ (GDPN\| FD, OILP, TRD) | 2 | 10.381 | 0.000*** | Cointegration |
| $F_{FD}$ (FD\| GDPN, OILP, TRD) | 1 | 4.199 | 0.007** | Cointegration |
| $F_{OILP}$(OILP\| FD, GDPN, TRD) | 1 | 5.996 | 0.001** | Cointegration |
| $F_{TRD}$(TRD\| FD, GDPN, OILP) | 1 | 2.770 | 0.042* | Cointegration |

** at 5%, ***at 1% * at 10%

Table 10: Estimated Long Run Coefficients using the ARDL Approach

ARDL(2,0,1,1) selected based on Schwarz Bayesian Criterion, Dependent variable is GDPN

| Regressor | Coefficient | Standard Error | T-Ratio | Probability |
|---|---|---|---|---|
| C | 1.25** | 0.600 | 2.070 | 0.040 |
| FD | .184* | .106 | 1.730 | .091 |
| OILP | .078 | .046 | 1.660 | .104 |
| TRD | 2.14*** | .088 | 24.310 | .000 |

Note : ** at 5%, ***at 1% * at 10%

Table 11: Error Correction Representation for the Selected ARDL Model

ARDL(2,0,1,1) selected based on Schwarz Bayesian Criterion. Dependent variable is DGDPN

| Regressor | Coefficient | Standard Error | T-Ratio | Probability |
|---|---|---|---|---|
| ΔFD | 0.111 | 0.008 | 1.390 | 0.172 |
| ΔOILP | 0.110*** | 0.004 | 2.570 | 0.014 |
| ΔTRD | 0.061 | 0.062 | 0.980 | 0.333 |
| ecm(-1) | -0.06*** | 0.174 | -3.450 | 0.001 |

Note : ** at 5%, ***at 1% * at 10%

Table 12: ARDL-VECM Model Diagnostic Tests

$R^2$=0.99, Adjusted $R^2$=0.99

| | |
|---|---|
| Serial Correlation אַ֤ ρ =.010[0.91] | Normality אַ֤ ς =0.053[0.97] |
| Functional Form אַ֤ ρ = .016[0.89] | Heteroscedasticy אַ֤ ρ =4.65[0.031] |

Figure 2: Cusum and Cusumq for coefficients stability for ECM model (2)

Plot of Cumulative Sum of Recursive Residuals

The straight lines represent critical bounds at 5% significance level

Table 13: Result from Bound test

| Dep. Var. | SIC Lag | F-statistic | Probability | Outcome |
|---|---|---|---|---|
| $F_{GDPO}$(GDPO\|FD, OILP, TRD) | 1 | 3.840 | 0.017** | Cointegration |
| $F_{FD}$(FD\|GDPO, OILP, TRD) | 1 | 1.313 | 0.297 | No Cointegration |
| $F_{OILP}$(OILP\| FD, GDPO, TRD) | 1 | 2.504 | 0.068 | Inconclusive |
| $F_{TRD}$(TRD\| FD, GDPO, OILP) | 1 | 1.959 | 0.138 | No Cointegration |

** at 5%, ***at 1% * at 10%

Table 14: Estimated Long Run Coefficients using the ARDL Approach

ARDL(1,1,0,0) selected based on Schwarz Bayesian Criterion, Dependent variable is GDPO

| Regressor | Coefficient | Standard Error | T-Ratio | Probability |
|---|---|---|---|---|
| C | 4.100 | 6.060 | .676 | .504 |
| FD | .170 | .123 | 1.44 | .157 |
| OILP | .193** | .082 | 2.35 | .025 |
| TRD | 3.140*** | .158 | 19.87 | .000 |

Note: ** at 5%, ***at 1% * at 10%

Table 15: Error Correction Representation for the Selected ARDL Model

ARDL (1,1,0,0) selected based on Schwarz Bayesian Criterion. Dependent variable is DGDPO

| Regressor | Coefficient | Standard Error | T-Ratio | Probability |
|---|---|---|---|---|
| ΔFD | -0.088 | 0.044 | -2.004 | 0.053 |
| ΔOILP | 0.021*** | 0.007 | 2.954 | 0.006 |
| ΔTRD | 0.349** | 0.149 | 2.340 | 0.025 |
| ecm(-1) | -0.111** | 0.051 | -2.155 | 0.038 |

Note : ** at 5%, ***at 1% * at 10%

Table 16: ARDL-VECM model diagnostic tests

| | |
|---|---|
| $R^2$=0.77, Adjusted $R^2$=0.73 | |
| Serial Correlation ℵ ᵞ ρ =2.049[0.152] | Normality ℵ ᵞ ς =.0211[0.989] |
| Functional Form ℵ ᵞ ρ = 2.291[0.130] | Heteroscedasticy ℵ ᵞ ρ =14.860[0.00] |

Figure 3: Cusum and Cusumq for coefficients stability for ECM model (3)