Capital Formation in Thailand: Its Importance and Determinants

Jiranyakul, Komain

National Institute of Development Administration

September 2014

Capital Formation in Thailand: Its Importance and Determinants

Komain Jiranyakul, School of Development Economics, National Institute of Development Administration, Thailand. Email: komain_j@hotmail.com

Abstract:

Using the dataset that comprises annual data during 1979 and 2012 and obtained from various sources, this study examines the importance of capital formation to Thai economy and what driving forces influence capital formation. The results show that real GDP and capital formation are cointegrated, and capital formation imposes a positive impact on real GDP in the long run. It is also found that stock market liquidity measured by stock market capitalization rather than foreign direct investment plays important role in capital accumulation process. These findings give some policy implications.

Keywords: Capital formation, economic growth, stock market capitalization, bounds testing.
JEL Classification: E22, O40

1. Introduction

Thailand is one of emerging market economies in Asia that has adopted the export-led growth strategy since 1972. This strategy has been believed by development economists that it can help an economy in achieving high economic growth. The average growth rate of the country during 2000 and 2012 was 4.2 percent with the high growth rate of 7.8 percent in 2010. The average growth rate of manufacturing output during the same period was 4.9 percent compared to 2.2 percent of that of agricultural output (World Development Indicators, 2014). This provides evidence that the manufacturing sector has been playing an important role in the growth process. However, the average growth rate of the country was close to those of Malaysia and the Philippines. The role of capital formation defined as investment by private enterprises could be a crucial driving force in the country's growth process. Theoretically, there are various determinants of capital formation. On the imports side, firms operated in the country rely heavily on imported capital goods, such as machinery and equipments. The data from the Bank of Thailand show that the average percentage of imports of capital goods in total imports was approximately 22 percent during 2000 to 2012. The sources of imports of capital goods were Japan, the United States, and the Euro Area countries. These imported equipments are necessary for the production of manufacturing products, both for exports and domestic consumption. The main importing countries of Thailand are the United States and Japan. Another driving force can be foreign direct investment (FDI). Inward FDI can be a source of technological transfer that can enhance the productive capacity, especially in the labor-intensive production processes. Multinational enterprises from Japan have been playing an important role in terms of inward FDI in the Thai economy. The domestic

currency appreciation after the 1997 Asian Financial Crisis is believed to induce inward FDI.

Recently, researchers tend to focus on the role of financial market in mobilizing investment funds via equity instrument to private enterprises. The debate on the relative roles of bank lending and capital market capitalization for capital formation still remains. Bank lending and market capitalization can be the contending or complement driving forces of capital formation.

The main objective of the present study is to examine the importance of capital formation and its determinants using available time series data from 1979 to 2012. The recently developed autoregressive distributed lag (ARDL) is employed to determine level relationship in bivariate and multivariate frameworks. The main advantages of this procedure over other cointegration technique are: firstly it can be applied to variables that are not integrated at the same orders as far as the order of integration of each variable does not exceed two, secondly re-parameterizing the model into the equivalent vector error correction model is not required. The next section gives evidence from previous studies. Section 3 describes data and methodology used. Section 4 presents the findings while the last section gives concluding remarks.

2. Literature Review

The role of capital formation on economic growth has been widely addressed since the emergence of the Solow (1956) growth model. The change in capital stock is from the change in the savings rate that can stimulate growth. In agricultural sector, Herr (1964) finds that capital formation is important in terms of productivity and that taxation, a measure of government policy, affects farm investment. However, for many developing countries, industrial sector has been playing important role in the last two decades. This implies that capital formation has been generated from manufacturing firms. The issue that private investment or public investment is more important in stimulating growth has also been addressed. Khan and Reinhart (1990) formulate a simple growth model that separates the impacts of public sector and private sector investment and use it to estimate a cross-section dataset of 24 developing countries. Their results support the notion that private investment has a larger direct effect on growth than that of public investment.

Some empirical studies emphasize the role of macroeconomic variables. Greene and Villanueva (1991) examine the effects of policies and macroeconomic variables on the rate of private investment in developing countries and find that the rate of private investment is positively related to real GDP growth, level of per capita GDP and the rate of public investment, but negatively related to real interest rate, domestic inflation, the debt-service ratio, and the ratio of debt to GDP. Serven and Solimano (1993) examine the impact of macroeconomic variables on investment performance of 15 developing countries using panel data. Their main findings are: 1) output growth and public investment have significantly positive impact on private investment, and 2) foreign debt burden, macroeconomic instability and the deterioration in world economic conditions impose significantly negative impact on private investment. Kim and Lau (1994) examine the sources of economic growth of four East Asian newly industrialized countries and five industrialized countries. They find that technical

progress can be represented as purely capital-augmenting in all countries. However, the most important source of growth in East Asian newly industrialized countries is capital accumulation. The opposite view is addressed by Jun (2003) who finds evidence that investment efficiency in rural industrialization of small firms in non-state sector is the cause of high growth rate in China. One main finding by Qin et al. (2006) is that the growth of capital stock or investment does not exogenously drive output growth regularly either in the short run or in the long run. It is the output that drives investment demand. In addition, rapid investment growth results in rising capital-output ratio in China rather than output growth acceleration.

The role of stock market can be important in the growth process. Stock markets with high liquidity can enable listed firms to acquire more capital stocks compared to the lending by bank sector. However, this issue is still controversial. Arestis et al. (2001) find evidence that banking development plays more important role than stock market development on economic growth. On the contrary, Caporale et al. (2004) find evidence obtained from a sample of seven countries, which suggests that a well-developed stock markets foster economic growth in the long run by fuelling the engine of growth through faster capital accumulation, and by turning it through better resource allocation. Naceur and Ghanzouni (2007) find no significant relationship between banking and stock market development and economic growth in eleven Middle East and North African countries. Wolde-Rufael (2009) re-examines the relation between financial development and growth in Kenya and finds bidirectional causality between domestic bank credits and economic growth. Decharax et al. (2009) employ quarterly data from the first quarter of 1996 to the second quarter of 2008 to investigate the crucial determinants of investment in Thailand. The results from their regressions show that real GDP growth, returns on investment and expectations of future returns positively affect private investment in subsequent periods. On the contrary, local currency devaluation, corporate leverage and political instability adversely affect private investment.

Yu et al. (2012) find causal linkages between financial development, stock market development and growth in cross-countries regressions for both regional and income groups. For the role of foreign direct investment on capital accumulation, Al-Sadig (2013) examine the effect of foreign direct investment (FDI) inflows on private investment using panel data of 91 developing countries over the period 1970-2000. The results show that FDI inflows stimulate private domestic investment. For low-income countries, the positive impacts of FDI on private investment depend on the availability of human capital.

For Asian economies, Pradhan et al. (2014) employ principal-component analysis, panel cointegration, and Granger causality tests to apply to recent data of 35 countries. They find that banking sector and stock market maturity lead to economic growth via inflation and trade openness. Paul (2014) examines the determinants of investment or capital formation in Bangladesh and finds that lending rate, domestic credit, trade, foreign aid, economic openness and financial deepening impose the long-run impact on investment.

3. Data and Methodology

The dataset used in this study comprises annual data during 1979 and 2012 and obtained from various sources. Gross capital formation in billion US dollars at 1970 constant price is obtained from Ivan Kushnir's Research Center. Consumer price index (CPI) and the US dollar exchange rate are obtained from the Bank of Thailand. Real capital formation in billions of baht is obtained by multiplying the gross capital formation series with the US dollar exchange rate. Real GDP, imports, foreign direct investment expressed in billions of baht are also obtained from the Bank of Thailand. These series are deflated by CPI such that they are in real terms. The lending rate by banks is obtained from the bank of Thailand while stock market capitalization is retrieved from the Stock Exchange of Thailand website. Real market capitalization is obtained by deflating nominal capitalization with CPI. The share of imports in GDP is the ratio of real imports to real GDP. All series are transformed into logarithmic series. The sample size comprises 34 observations.

The present study adopts the asymptotic theory proposed by Pesaran et al. (2001) to test the existence of level relationship between a variable and its regressors when the degree of integration of each variable is not certainly known. This bounds testing procedure can provide unbiased long-run estimates and valid test statistics. The conditional error correction mechanism (ECM) of the bounds testing in a multivariate framework can be expressed as:

$$\Delta y_t = \alpha_0 + \sum_{i=1}^{p} \beta_i \Delta y_{t-i} + \sum_{j1=0}^{p1} \gamma_{1j} \Delta x_{1t-j1} + \sum_{j2=0}^{p2} \gamma_{2j2} \Delta x_{2t-j2} + ... + \sum_{jk}^{pk} \gamma_{kjk} \Delta x_{kt-jk} + \lambda e_{t-1} + u_t \quad (1)$$

where Δ denotes the first difference operator, y denotes the dependent variables and $x_1, x_2, \ldots, x_k$ denote the independent variables or the driving forces. The lag orders p, $p_1, p_2, \ldots, p_k$ of the first difference of variables are not necessary the same. The error correction term (ECT) is the lagged residuals (e_{t-1}) from the long-run equation. Without the ECT, equation (1) becomes an ARDL($p,p_1, p_2,\ldots,p_k$) model.[1] By adding lagged variables to the specified ARDL model, the following equation will be obtained.

$$\Delta y_t = \alpha_0 + \delta_0 y_{t-1} + \delta_1 x_{1t-1} + \delta_2 x_{2t-1} + ... + \delta_k x_{kt-1} + \sum_{i=1}^{p} \beta_i \Delta y_{t-i} + \sum_{j1=0}^{p1} \gamma_{1j} \Delta x_{1t-j1} + \sum_{j2=0}^{p2} \gamma_{2j2} \Delta x_{2t-j2}$$
$$+ ..... + \sum_{jk}^{pk} \gamma_{kjk} \Delta x_{kt-jk} + u_t \quad (2)$$

The model in equation (2) is tested against the ARDL($p,p_1, p_2,\ldots,p_k$) model to examine whether the lagged level of independent variables that are added to the ARDL model impose a significant impact on the dependent variable. In other words, the null hypothesis: $\delta_1 = \delta_2 = ... = \delta_k = 0$ is tested against the alternative hypothesis that these coefficients are not equal to zero. The computed F-statistic is obtained from

[1] The ARDL model that is free of serial correlation will give a reliable result.

this test. the computed F-statistic to be compared with the upper bound and lower bound critical values provided by Pesaran et al. (2001). If cointegration exists, the computed F-statistic will be larger than the upper bound critical value. If cointegration does not exist, the computed F-statistic will be smaller than the lower bound critical value. The computed F-statistic that takes the value between the upper bound and lower bound critical values will lead to an inconclusive result. By setting all first differenced variables to zero, the long-run equilibrium equation will become:

$$y_t = a_0 + a_1 x_{1t} + a_2 x_{2t} + ... + a_k x_{kt} + e_t \quad (3)$$

The main advantage of the conditional ARDL procedure in testing for cointegration is that re-parameterization of the model into the equivalent vector error correction model is not required compared with other techniques of cointeration tests.

4. Empirical Results

Even though testing for unit root of variables is not required in conducting the bounds testing for cointegration, the procedure is not suitable if any variable is integrated of order two, i.e., it is I(2) series. The PP tests proposed by Phillips and Perron (1988) are used to test for unit root of all variables of interest.[2] The results are reported in Table 1. The results of unit root tests show that three series are integrated of order one, I(1), and two series are integrated of order zero, I(0). All of the series do not appear to be integrated of order two, I(2). Therefore, the bounds testing is eligible for cointegration test.

Due to the small sample size that is used in the present study, the models in Section 2 are performed under bivariate or trivariate framework so as to prevent the loss of degree of freedom, which can lead to unreliable estimates of parameters. How important capital formation (*lcf*) in determining real GDP (*ly*) is tested in a bivariate cointegration test. The ARDL (0,3) model is chosen and free of serial correlation with Chi-square stististic of 0.893 and the probability of accepting the null hypothesis that the residuals exhibit no serial correlation is 0.640. The results of long-run relationship with the 1997 financial dummy variable (*Dt*)[3] and short-run dynamics are shown in Table 2.

[2] According to Choi and Chung (1995), the PP tests seem to be powerful for low frequency data, specifically annual data.

[3] The dummy variable takes the value of zero before 1997 and of one thereafter.

Table 1 Results of PP tests for all variables, 1979-2012

	Level of variables		First difference of variables		
Variables	Test A	Test B	Test A	Test B	Integration
Capital formation (*lcf*)	-1.50 (0.52)	-0.64 (0.75)	-4.84 (0.01)	-4.89 (0.00)	I(1)
GDP (*ly*)	-.2.83 (0.06)	-0.87 (0.99)	-3.95 (0.01)	-5.27 (0.00)	I(1) or I(0)
FDI (*lfdi*)	-2.44 (0.14)	-3.05 (0.13)	-8.67 (0.00)	-8.20 (0.00)	I(1)
Share of imports in GDP (*lsm*)	-0.41 (0.89)	-3.21 (0.10)	-5.72 (0.00)	-5.66 (0.00)	I(1) or I(0)
Stock market capitalization (*lmc*)	-1.04 (0.73)	-1.61 (0.77)	-5.17 (0.00)	-5.16 (0.00)	I(1)

Note: Test A includes intercept only while Test B includes intercept and a linear trend. The number in parenthesis is the probability of accepting the null hypothesis of unit root. I(1) or I(0) indicates that at least one test shows the series is I(0).

The result from bounds test shows that cointegration exists between *ly* and *lcf* because the computed F-statistic of 7.04 is larger than the upper bound critical value of 5.73 at the 5 percent level of significance. The diagnostic tests for the validity of ECM estimate show that it is free of serial correlation and heteroskedasticity. Also the residuals are normally distributed.

Table 2 Results of long-run and short-run dynamics estimates of the impact of capital formation on real GDP, 1979 to 2012

Panel A. Long-run estimation with *ly* as dependent variable	
	Coefficient
lcf_t	0.609 (2.648)**
D_t	0.978 (5.644)***
Constant	6.323 (2.139)**
Adjusted R^2	0.816
Panel B. ECM estimation with Δly as dependent variable	
Δlcf_t	0.078 (1.063)
Δlcf_{t-1}	0.113 (1.554)
Δlcf_{t-2}	0.056 (0.760)
Δlcf_{t-3}	-0.090 (-1.210)
e_{t-1}	-0.099 (-2.865)***
Adjusted R^2	0.240
Diagnostic tests:	
Serieal correlation (LM)	1.973 (p=0.373)
Normality (Jarque Bera)	3.865 (p=0.145)
Heteroskedasticity (ARCH)	1.043 (p=0.307)

Note: The number in parenthesis is t-statistic. p is the probability of accepting the null hypotheses that there is no serial correlation, no heteroskedasticity, and residuals are normally distributed. *** and ** denote significance at the 1 and 5 percent level, respectively.

In the long run, a one percent increase in real capital formation causes an increase in real GDP by 0.6 percent (Panel A of Table 2). This indicates that real capital formation is one of the main determinants of real GDP. The significantly positive coefficient of the 1997 financial crisis shows that the crisis imposes a positive impact for the contribution of capital formation to real GDP. It should be noted that there are various macroeconomic variables that can impose different impacts on capital formation (see Serven and Solimanu, 1993, among others). Therefore, the estimated equation illustrates the contribution of capital formation to real GDP.

The short-run dynamics result from error correction mechanism (ECM) estimate is illustrated in Panel B of Table 2. In the short run, the relationship between output growth and a change in capital formation is positive, but is not statistically significant. Furthermore, all coefficients of lagged *lcf* are insignificant. Therefore, a change in capital formation does not affect the growth rate in the short run. However, the estimated coefficient of the error correction term (e_{t-1}) is significantly negative and takes the absolute value of less than one. This indicates that any deviation from long-run equilibrium will be corrected.

The above results show that how capital formation is capable of generating real GDP for the country. It is interesting to find cointegration in a bivariate framework because there are various variables as determinants of real GDP.

There remain some questions such as: 1) what are factors affecting capital formation in the long run?, and 2) what are important policy measures that foster these influential factors? Different forcing (independent) variables can be influential determinants of capital formation. Two models are estimated to obtain the existence of cointegration between capital formation and its forcing variables. The first model stipulates that share of imports and market capitalization are the driving forces of capital formation while the second model stipulates that FDI and market capitalization are the driving forces of it. The results are reported in Table 3.

Table 3. Results of bounds testing for cointegration with capital formation as dependent variable, 1979-2012

Model	Computed F-statistic	$\chi^2_{(2)}$
1. ARDL (2,1,1) for *lcf*, *lsm*, and *lmc*.	4.812	0.043 (p=0.979)
2. ARDL (2,1,1) for *lcf*, *lfdi*, and *lmc*.	3.949	1.228 (p=0.541)

Note: The computed F-statistic is used to test the null hypothesis that the coefficients of lagged level of variables are equal to zero. The ARDL models must be free of serial correlation using the LM test with the Chi-square and its probability shown in parenthesis.

The criterion for choosing lag length in an ARDL model is the parsimonious model that is free of serial correlation. The Lagrangian Multiplier serial correlation test with the Chi-square statistic with the degree of freedom of two ($\chi^2_{(2)}$) rejects the null hypothesis that there is serial correlation in the residuals in each model. Table 3 summarizes the bounds critical values for unrestricted intercept and no trend for models with different regressors and their criteria.

Table 4 Bounds critical values

	F-statistic	Critical bound
Two regressors	3.79 to 4.85	5 percent
	3.17 to 4.14	10 percent
	2.72 to 3.77	10 percent
	2.45 to 3.52	10 percent
Criteia: Above the upper bound critical value		Cointegration
Below the upper bound critical value		No cointegration
Between the lower and upper bounds critical value		Inconclusive result

Note: Adapted from Table CI (iii) Case III in Pesaran et al. (2001).

The results in Table 3 indicate that cointegration exists in Models 1, but it does not exist in Model 2. Model 1 exhibits cointegration at the 10 percent level of significance because the computed F-statistic of 4.81 is larger than the upper bound critical value of 4.14. For Model 2, the computed F-statistics are below the lower bound critical values at the 5 and 10 percent level of significance (Table 4).

Table 5 Results of long-run and short-run dynamics estimates of the impact of share of imports and stock market capitalization on capital formation, 1979 to 2012

Panel A. Long-run estimation with *lcf* as dependent variable	
	Coefficient
lsm_t	0.030 (0.177)
lmc_t	0.219 (5.386)***
D_t	-0.083 (-0.764)
Constant	11.438 (10.644)***
Adjusted R^2	0.828
Panel B. ECM estimation with Δlcf as dependent variable	
Δlcf_{t-1}	0.337 (1.898)*
Δlcf_{t-2}	0.382 (2.823)***
Δlsm_t	0.581 (3.453)***
Δlsm_{t-1}	-0.008 (0.039)
Δlmc_t	0.019 (0.469)
Δlmc_{t-1}	0.036 (0.737)
e_{t-1}	-0.539 (-3.506)***
Adjusted R^2	0.693
Diagnostic tests:	
Serieal correlation (LM)	0.115 (p=0.994)
Normality (Jarque Bera)	3.829 (p=0.147)
Heteroskedasticity (ARCH)	1.132 (p=0.287)

Note: The number in parenthesis is t-statistic. p is the probability of accepting the null hypotheses that there is no serial correlation, no heteroskedasticity, and residuals are normally distributed. *** and * denote significance at the 1 and 10 percent level, respectively.

The results of long-run equilibrium relationship and short-run dynamics are shown in Table 5. The long-run coefficient on the share of imports in real GDP is insignificantly positive, implying that capital formation does not depend on this variable in spite of the fact that there has been a substantial proportion of equipments and machinery in total imports. However, the positive impact of market capitalization is significant, implying that stock market plays a crucial role of capital formation in Thailand. A one percent increase in real market capitalization causes real capital formation to increase by 0.22 percent. Compared with other driving forces, such as real GDP and bank lending, market capitalization can be considered the important driving force in the process of capital formation in the country.[4]

For the ECM estimate, diagnostic tests reveal that there are no serial correlation and heteroskedasticity in the residuals. The residuals are normally distributed. The highly significant coefficient of the error correction term (e_{t-1}) of -0.54 indicates that any deviation from long-run relationship will be corrected in a rapid speed. In addition, there is a positive short-run relationship between a change in the share of imports and a change in capital formation. It should be noted that the share of imports does not affect capital formation in the long run, but it does in the short-run.

The findings on the significant long-run impact of market capitalization and on the significant short-run impact of the share of imports on capital formation give some policy implications. Some measures that can foster the development of the stock market seem to be necessary in the future even though the stock market have been recently more developed. The bank borrowing rate might not directly effect capital formation, but might indirectly affect it. If fund mangers and investors can borrow at the lower rate, they can invest more in some blue ship stocks in energy and manufacturing sectors. This can lead to larger market capitalization in the future. Furthermore, the government can create investment climate for firms by ensuring macroeconomic stability so that firms can invest more in capital goods. As a result, higher long-run growth rate can be achieved in the near future.

5. Concluding Remarks

Many empirical studies investigate the role of capital formation or investment on output, but few studies emphasize the determinants of capital formation. The present study examines the impact of capital formation or investment on real GDP and its determinants. By employing the recent time series analysis techniques, the bounds testing shows that capital formation or investment imposes a positive long-run impact on real GDP. This result shows how important capital formation in determining real GDP in Thai economy. Even though there is no short-run relationship between a change in capital formation and the growth rate because the coefficient is insignificantly positive, there exists long-run causality running from capital formation

[4] Real GDP and bank lending rate as used as each driving force along with market captitalization, but cointegration is not found because very low computed F-statistics are obtained. Therefore, real GDP is not a driving force of capital formation. The insignificant impact of bank lending on capital formation implies that large enterprises in the country do not rely on bank lending. Therefore, financial deepening does not play any role in capital formation.

to real GDP because the coefficient of the error correction term is significant. What the determinants of capital formation are is also investigated. It is found that stock market liquidity measured by stock market capitalization rather than foreign direct investment plays important role in capital accumulation process. Again, there is long-run causality running from the share of imports and market capitalization to capital formation as indicated by the significance of the coefficient of the error correction term in the analysis of short-run dynamics. Therefore, the government should create more favorable investment climate for firms by ensuring favorable financial conditions so that firms can invest more in capital goods if the main target is to enhance higher economic growth rate.

References

Al-Sadig, A., 2013. The effect of foreign direct investment on private domestic investment: evidence from developing countries. Empirical Economics, 44, 1267-1275.

Arestis, P., Demetriades, P., Luintel, K., 2001. Financial development and economic growth: the role of stock markets. Journal of Money, Credit and Banking, 33, 16-41.

Caporale, G. M., Howells, P. G. A., Soliman, A. M., 2004. Stock market development and economic growth; the causal likage. Journal of Economic Development, 29, 33-50.

Choi, I., Chung, B., 1995. Sampling frequency and the power of tests for a unit root: a simulation study. Economics Letters, 2, 131-36.

Decharax, K., Leelapornchai, P., Udomkerdmongkol, M., 2009. Thailand's investment in the post-crisis era: issues and challenges. Bank of Thailand Discussion Paper.

Greene, J., Villanueva, D., 1991. Private investment in developing countries: an empirical analysis. IMF Staff Papers, 38, 33-58.

Herr, W. M., 1964. Capital formation: its importance and determinants. Australian Journal of Agricultural Economics, 8, 97-111,

Jun, Z., 2003. Investment, investment efficiency, and economic growth in China. Journal of Asian Economics, 14, 713-734.

Khan, M., Reinhart, C., 1990. Private investment and economic growth in developing countries. World Development, 18, 19-27.

Kim, J-I., Lau, L., 1994. The source of growth of East Asian newly industrialized countries. Journal of the Japanese and International Economics, 8, 235-271.

Naceur, S. B., Ghanzouni, S., 2007. Stock market, banks and economic growth: empirical evidence from the MENA region. Research in International Business and Finance, 21, 297-315.

Paul, B. P., 2014. How to finance investment in Bangladesh: finding long-run factors in a bounds test method. International Journal of Finance and Banking, 1, 13-24.

Pesaran, M. H., Shin, Y, Smith, R. J., 2001. Bounds testing approaches to the analysis of level relationships. Journal of Applied Econometrics, 16, 289-326.

Phillips, P. C. B., Perron, P., 1988. Testing for a unit root in time series regression. Biometrika, 75, 335-346.

Pradhan, R. P., Arvin, M. B., Norman, N. R., Hall, J. H., 2014. The dynamics of banking sector and stock market maturity and the performance of Asian economies: time series evidence. Journal of Economic and Administrative Sciences, 30, 16-44.

Qin, D., Cagas, M. A., Quising, P., He, X-H., 2006. How much does investment drive economic growth in China? Journal of Policy Modeling, 28, 751-774.

Serven, L., Solimano, A., 1993. "Debt crisis, adjustment policies, and capital formation in developing countries: where do we stand? World Development, 21, 127-140.

Solow, R. M., 1956. A contribution to the theory of economic growth. Quarterly Journal of Economics, 70, 65-94.

Wolde-Rufael, Y., 2009. Reexamining financial development and economic growth nexus in Kenya. Economic Modelling, 26, 1140-1146.

World Development Indicators, 2014. World Bank, Washington, D. C.

Yu, J., Hassan, M. K., Sanchez, B., 2012. A re-examination of financial development and economic growth. Applied Economics, 44, 3479-3489.