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AUTHORS	Erasmus L. Owusu Nicholas Odhiambo

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Erasmus L. Owusu (UK), Nicholas M. Odhiambo (South Africa)

Financial liberalization and economic growth in Ivory Coast: an empirical investigation

Abstract

This paper examines the relationship between financial liberalization policies and economic growth in Ivory Coast. Specifically, the study employs the autoregressive distributed lag (ARDL)-bounds testing approach to examine the long-run relationship between economic growth, which is measured by real GDP per capita and financial liberalization, which is represented by an index – calculated by using principal component analysis (PCA). The empirical findings show that the effects of financial liberalization policies on economic growth are negligible in the short run as well as in the long run. This finding, though contrary to the expectation of our study, is consistent with a number of previous studies in which negative or inconclusive results regarding the effects of financial liberalization on economic growth have been reported.

Keywords: economic growth, financial liberalization, ARDL-Bounds Testing Approach, co-integration, Ivory Coast.
JEL Classification: C32, G15, O16, O47.

Introduction

It is widely acknowledged by many economists that the efficient organization of the financial system is crucial to economic growth; but if it is poorly organized, it could hamper economic growth and development[1]. This assertion is implicitly based on the dominant view that the working of the financial system (such as financial institutions and others) can be portrayed as an intermediary between savers and investors. Based on this view, for at least the past thirty years, both neo-classical economists and World Bank/IMF representatives have been advising developing countries to liberalize their financial sectors. They argue that financial liberalization[2] can lead to an increase in savings, higher investment, efficient allocation of financial resources, and hence, rapid economic growth (Gibson and Tsakalotos, 1994). The purpose of this paper is to empirically investigate and provide insight into the impact of financial liberalization on economic growth in Ivory Coast (a member of the Economic Community of West African States – ECOWAS[3]). In this investigation, we construct a financial liberalization index factor[4], which encompasses all the relevant policies of financial liberalization taken in Ivory Coast, using PCA. The study applies the empirical analytical method of ARDL-bounds testing approach, in an attempt to establish a long-term relationship between financial liberalization and economic growth – using time-series data. The sources of the data include various issues of the World Bank's World Development Indicators, the World Bank's African Development Indicators, the IMF's International Financial Statistics, the West African Economic and Monetary Union (WAEMU), as well as other relevant sources. This paper contributes to the literature on financial liberalization, by establishing whether financial liberalisation policies have any positive influence on economic growth in Ivory Coast. The paper uses data from 1969 and 2008, thus covering both the periods of financial repression and financial liberalisation. However, the main period of this paper is the post-liberalization period. The motivation for using the financial liberalization index factors is to ensure that all the various financial liberalization policies implemented for the attainment of full financial liberalization status are taken into account for Ivory Coast (Caprio et al., 2001 and Laeven, 2003). Moreover, most of the earlier studies completed on financial liberalization and economic growth were based on evidence from Latin American and the East Asian countries, with little attention being paid to African countries, especially primary commodity countries in the region.

The rest of the paper is organized as follows. Section 1 reviews the financial liberalization policies in Ivory Coast. Section 2 deals with literature review, both theoretical and empirical. In section 3, we look at the methodology and the empirical analysis. The final section concludes the study.

1. Overview of financial liberalization policy in Ivory Coast

As in many other African countries, Ivory Coast has, since independence, adopted the policy of financial sector intervention – in the hope of

Erasmus L. Owusu, Dr., DLitt et Phil, Measurement Sciences Business Leader, AC Nielsen, Oxford, UK.
Nicholas M. Odhiambo, Ph.D., Professor of Economics, Department of Economics, University of South Africa, South Africa.
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[1] Early works on the importance of finance in the process of industrialization were undertaken by, for example, Goldsmith (1955, 1966, 1968); Gerschenkron (1965); Cameron (1967, 1972); and Patrick (1966).

[2] The term financial liberalization in this paper refers to the combined policies of interest rate and capital account liberalizations.

[3] The Economic Community of West African States is made up of 15 countries in the in the West African sub-region, namely: Benin, Burkina Faso, Cape Verde, Ivory Coast, Gambia, Ghana, Guinea-Bissau, Guinea, Liberia, Mali, Niger, Nigeria, Senegal, Sierra Leone and Togo.

[4] This factor will be used instead of dummies to represent the effect of financial liberalization policies in the selected countries. A similar approach was employed by Caprio et al. (2001) and Laeven (2003).

promoting economic growth and development (World Bank, 1989). This included interest rate controls, directed credit to priority sectors and securing bank loans at below market interest rates to finance budget deficits. These policies turned out to be detrimental to the domestic financial system: thereby stifling economic growth and development. In the late 1980s, the financial system was especially hard hit by the fall in earnings from cocoa exports. This led to a massive liquidity crisis in the Ivorian financial system. In 1987, the Ivorian Bank for Construction and Public Works (Banque Ivoirienne de Construction et de Travaux Publics – BICT) and the National Savings and Loan Bank (Banque Nationale d'Epargne et Credit – BNEC) were closed by the financial authorities. In early 1988, the National Agricultural Development Bank (Banque Nationale pour le Dévelopment d'Agricole – BNDA), which provided credit to peasant farmers, and Ivory Coast Credit Bank (Crédit de la Cote d'Ivoire – CCI), an industrial development bank, suspended operations (African Studies Center, 1988).

Also, regulations governing credit allocations discouraged local investment. Banks preferred high liquidity, which meant that short and medium-term loans, i.e. loans repayable within a period of between one and five years, were granted only against short and medium-term funds, effectively preventing loans to local and indigenous businesses, which in most cases, lacked the financial resources. Thus, prior to the financial liberalization, the majority of short and medium-term credit allocations in Ivory Coast went to foreign investors (African Studies Center, 1988).

In 1990, in the face of macroeconomic instability, the liquidity crisis, the balance-of-payment problems, internal political crises and internal inconsistent economic policies, Ivory Coast liberalized its preferential discount rate. This was followed by bank interest rate de-regulations. This was the first step to a structured liberalization policy. However, Ivory Coast continued to have negative real interest rates – even after the liberalization (Montiel, 1995). By liberalizing the preferential discount rate, Ivory Coast was geared towards restructuring the financial sector, controlling inflation, as well as strengthening the external reserves positions. However, in the case of Ivory Coast, financial liberalization mainly took the form of privatization of banks, restructuring and bank liquidation, as well as strengthening of the banking supervision regime (Inanga and Ekpenyong, 2002).

According to the IMF, in Ivory Coast, the government's objectives under this interest rate liberalization were to strengthen the financial sector by increasing domestic savings and boosting the competitiveness and efficiency of banking and financial institutions – by streamlining and improving the banking supervision regime. This entailed legal and regulatory reforms, as well as the expansion of the range of financial services and instruments made available to private sector investors and depositors – and in particular through: (a) the launching of the regional financial market; and (b) the development of decentralized, local financial institutions (IMF, 1996). According to IMF (1996), Ivory Coast also took the necessary measures to address the weaknesses noted by the Banking Commission regarding non-performing agriculture credits. In addition, the authorities helped to diversify financial instruments, so that the financial system could better allocate the long-term resources needed for investment by enterprises.

When the financial liberalization policy started in 1990, Ivory Coast already had a stock exchange. As part of the policy, the exchange was modernized and fully deregulated in 1998, to turn it into a regional exchange for eight West African Countries. Accordingly, in 1998, foreign investors were allowed to participate in the capital market – with all the benefits that such participation affords. The Ivorian stock market was created in 1973; and it was named Bourse des Valeurs d'Abidjan (hereafter called the BVA). The stock exchange market started with 22 listed companies. The number of listed companies reached 35 in 1997, before the BVA was transformed into a regional Stock Market (Bourse Régionale des Valeurs Mobilières [BRVM]). In 1994, when the CFA was devalued, the market capitalization increased sharply; and that trend continued until 1999, before dropping the following year – due mainly to the military coup and the political instability that followed (N'Zue, 2006).

2. Theoretical and empirical literature review

2.1. Theoretical issues. The McKinnon-Shaw hypothesis, that financial liberalization would enhance growth, has been extended to consider liberalization, along with macroeconomic stabilization programmes and capital-account liberalization. Most of the models, which seek to formalize the hypothesis, concentrate on the effects of financial liberalization – either on the quantity of investment (Kapur, 1976; Mathieson, 1980) or on its quality (Galbis, 1977). Kapur (1976) examines the impact of liberalization in an economy characterized by under-utilized fixed capital and surplus labour. He argues that the real supply of credits affects capital accumulation through its role as the sole source of finance for working-capital requirements.

The real credit supply is determined by the demand for broad money, which in itself is a function of inflation and the deposit rate of interest. A rise in

the deposit rate works more indirectly on the supply of credits, and hence, the supply of bank deposits increases. This allows banks to give more credits (Gibson and Tsakalotos, 1994). Mathieson's (1980) model is similar to that of Kapur (1976) with the only difference being that banks credit finances, not only the net additions to working capital, but to fixed assets also. In both Kapur (1976) and Mathieson (1980), increased growth is the result of an increase in the quantity of investment, while McKinnon and Shaw's growth is as a result of an increase in the quantity and quality of investments.

The principal critics of the McKinnon-Shaw hypothesis are Van Wijnbergen (1983) and Taylor (1983)[1]. Using Tobin's portfolio framework for a household, the household choice of investments includes a time deposit, loans to business through the informal sector, and gold or currency. They argue that, in response to the increase in interest rate on deposits, households will substitute these for gold or cash and loans in the informal sector. Van Wijnbergen (1983) contrasts his model to those of McKinnon (1973) and Kapur (1976). He expresses the view that the outcomes of the McKinnon-Kapur models depend crucially on one implicit assumption on the asset market structure, an assumption that is never stated explicitly: that the portfolio shift into bank deposit is coming out of "unproductive" assets, like gold or cash and inventories. He further argues that it is not at all obvious that bank deposits are closer substitutes for cash, gold, livestock and other commodities, but rather to loans extended on the informal sector.

As already mentioned above, the theory of financial liberalization, since McKinnon (1973) and Shaw (1973) has advanced from focusing on credit markets and interest rates to include the private sector. In some of the recent studies, the debate has been focused on the dynamics of the liberalization of the debt (bonds) and equity markets, and their effect on economic growth in developing countries. Capital account liberalisation refers to a deliberate policy by which the government of a country allows foreign investors to participate in the domestic shares and bonds market, while at the same time, allowing domestic investors to trade in foreign securities (Tswamuno et al., 2007).

Opponents of capital account liberalization argue that it increases the risk of speculative attacks and increases a country's exposure to international shocks and capital flight; and hence, it jeopardizes the economic growth. Stiglitz et al. (1994) argue that information asymmetries, which are especially endemic to financial markets and transactions in developing countries, can be detrimental to capital account liberalization. They further contend that compared with their developed counterparts, the markets in developing countries do not have the capability to assemble information relevant to financial transactions; and thus, they cannot guarantee that capital will flow to where its marginal productivity exceeds its opportunity cost. Even though, Stiglitz et al. (1994) are merely worried about the effects of information asymmetry on capital account liberalization, they have pointed out one of the significant limitations to the neo-classical model, as proposed by Solow (1956), Henry (2006) and others.

2.2. Some empirical evidence. Empirical evidence of the McKinnon-Shaw hypothesis has been shown to have rather mixed results. This may be an indication that the interest rate liberalization policy alone is a necessary but insufficient condition for economic growth and development in developing countries. Most of the evidence of the interest rate liberalization hypothesis seems to suggest a significant improvement in the quality of investment, but not in the quantity of investment, and the volume of savings. Also, available evidence shows that in addition to macroeconomic stabilization, sound and proven regulation of the financial sector seems to play an important role in the successful implementation of the interest rate liberalization policy.

Oshikoya (1992), using the time-series econometrics on data, from 1970 to 1989 to investigate whether interest rate liberalization has any effect on economic growth in Kenya, shows a negative and insignificant coefficient for the real interest rate. However, after dividing the sample into the two sub-periods of 1970-1979 and 1980-1989, the results show that the real interest rate had a negative and significant coefficient for the 1970-1979 period, but was positive and significant for the 1980-1989 period. These results offer no robust support for the positive effect of interest rate liberalization on economic growth.

Bashar and Khan (2007) evaluate the impact of liberalization on the economic growth in Bangladesh, by analyzing time-series data from 1974 to 2002, using co-integration and error-correction methods. The results suggest that long-run economic growth in Bangladesh is largely explained by physical capital and real interest rates; while economic growth remains unaffected by short-term changes in the labour force and the secondary enrolment ratio. They conclude that the reason why financial liberalization has had a significant negative impact on economic growth is that financial reforms have failed to attract new investment – due to the adverse

[1] See also Grabel (1995, 1994), Studart (1996), Dutt (1990) and Burkett and Dutt (1991).

investment climate. Furthermore, they point out the effects of capital account liberalization were rather insignificant. This was possibly due to the weak supply response, and the lack of credibility of such liberalization programs.

In some empirical evidence from Africa, Tswamuno et al. (2007), for example, use data from South Africa, to study the relationship between capital account liberalization and economic growth. And they conclude that the equity and bond markets do not stimulate economic growth. Another study conducted by Onaolapo (2008) agreed with the study of Tswamuno et al. (2007). Using data from Nigeria for the period of 1990 and 2006, Onaolapo (2008) conducted a causality test, and concluded that while economic growth leads to an increase in market capitalization, the reverse is not true.

Also, Naceur, Ghazouani and Omran (2008) using panel data from 11 Middle East and North African (MENA) countries between the periods of 1979 to 2005 found that the Stock Market liberalization did not lead to economic growth in the MENA region. However, they found that there exists a long-term positive relationship between stock market liberalization and economic growth. A similar conclusion was also reached by Shahbaz et al. (2008).

Quinn and Toyoda (2008) tested whether capital account liberalization leads to economic growth, using pooled time-series data from 93 developed and developing countries from 1950 to 2004. They found that capital account liberalization has a positive association with economic growth in both the developed and the developing countries. Employing cross sectional OLS and the system of GMM estimators, they concluded that equity markets liberalization has had an independence effect on economic growth.

3. Methodology and empirical analysis

3.1. Methodology. This paper follows Beck et al. (2000) and specifies a modified model for real GDP per capita as the dependent variable with the following as the explanatory variables. Thus, foreign direct investments, government expenditure, real export revenue, inflation and the financial liberalization index, as well as variables for labor and capital formation. The model used in this study can therefore be expressed as follows:

$$\begin{aligned} \mathrm{In}Y_t &= C_t + \alpha \mathrm{Ln}K_t + \beta \mathrm{Ln}L_t + \phi FDI_t + \\ &+\theta \mathrm{Ln}GEXP_t + \eta \mathrm{Ln}RXR_t + \pi \mathrm{Ln}INFL_t + \\ &+\omega FLBL_t + \varepsilon_t, \end{aligned} \quad (1)$$

where Y is the GDP per capita (RGDP); K is the capital stock; L is the labor force; *FDI* is the foreign direct investment; *RXR* is the real export revenue; *GEXP* is the real government expenditure; *INFL* is the inflation; *FLBL* is the combined financial liberalisation index; C_t is a constant parameter; ε is the white noise error term; and Ln is natural log operator.

Financial liberalization is expected to lead to rapid economic growth and development. Real government expenditure (*GEXP*) is calculated as a ratio of GDP. This variable was included, because it is expected to crowd out private investments. This has a consequence on financial deepening; and hence, on economic growth. Barro and Sala-i-Martin (1995) argue that government expenditure does not directly affect productivity, but it could lead to distortions in the private sector. Many economists share the view that the benefits derived from increased real export revenue (*RXR*) include greater capacity utilization, economies of scale, incentives to technological improvements, development of indigenous entrepreneurship and efficient management due to competition from abroad (Balassa, 1978; Srinivasam, 1978; and Krueger, 1980). Hence, the coefficient of real export revenue is expected to be positive. To improve the efficiency of capital requires human effort; and this has been captured, by including capital stock (K) and a labor factor (L) in equation (1). Foreign direct investments are known to have positive effects on economic growth (Bengoa-Calvo, 2002). Consequently, its coefficient is expected to be positive and statistically significant. Inflation (*INFL*) has been included as one of the macroeconomic indicators, because it can be viewed as an indicator of bad macroeconomic policies, which are likely to make a country prone to crises. Fischer (2003) shows that inflation is detrimental to economic growth. Furthermore, De Gregorio (1993) points out that higher inflation has the effect of reducing the labor supply; and hence, it reduces economic growth.

Finally, the combined financial liberalization index (*FLBL*) is calculated by using principal component analysis (PCA). This is included in the model to show the various policy changes throughout the process of implementing the financial liberalization policy. According to Shrestha and Chowdhury (2006), in order to derive the financial liberalization indices, some arbitrary value is assigned to each of the financial liberalization policy variables. Each policy variable can take a value between 0 and 1 depending on the implementation status (see Caprio et al., 2001; Laeven, 2003 for a detailed exposition of the method).

When a particular sector is fully liberalized, that policy variable takes a value of 1, and when that sector remains regulated, it takes a value of 0. To capture the scenario of part, step-wise or gradual

liberalization process in a particular sector, partial values like 0.33, 0.50, and 0.66 would be assigned. A value of 0.50 would indicate the first phase of partial deregulation in a two-step deregulation process, whereas a value 0.33 and 0.66 would indicate the first and second steps, respectively, in a three-phased deregulation process.

The two-phased process takes a value of 1 in the second phase and the three-phased case takes a value of 1 in the third phase. In other words, if a sector is fully liberalised in a single phase, the value assigned in this case is 1. But if the liberalization is completed in two phases, then 0.5 is assigned for the first phase and 1 for the second. Similarly, if the liberalisation takes place in three phases, then the number assigned is 0.33 for the first phase, 0.66 for the second phase and 1 for the last phase (Shrestha and Chowdhury, 2006). The above methodology was applied on Regulatory and Legal Reforms policies, Institutional Restructuring policies, Capital Account liberalization policies, Monetary control policies, Interest Rate policies, Capital Market development, Secondary Reserve requirement policies and the Creation of Universal banking policies to establish the financial liberalization index.

The ARDL-bounds testing approach used in this study involves two stages. The first stage is to estimate the ARDL-model of interest by ordinary least squares (OLS), in order to test for the existence of a long-run relationship among the relevant variables. This is done by conducting a Wald test (*F*-test version for bound-testing methodology) for the joint significance of the lagged levels of the variables. If the computed F-statistic exceeds the upper critical bounds value, then the null hypothesis of no long-run relationship can be rejected, irrespective of the orders of integration for the time series. Conversely, if the test statistic falls below the lower critical values, then the null hypothesis cannot be rejected. However, if the *F*-statistic falls between the upper and the lower critical values, then result is inconclusive.

Once the long-run relationship or co-integration has been established, the second stage of the testing involves the estimation of the long-run coefficients (which represent the optimum order of the variables after selection by AIC or SBC), and then estimating the associated error correction model – in order to calculate the adjustment coefficients of the error correction term (Masih et al., 2008). Thereafter, a general ARDL-UECM model can be formulated as follows:

$$\begin{aligned}\Delta \mathrm{Ln}Y_t = {} & c_0 + \delta_1 \mathrm{Ln}Y_{t-1} + \delta_2 \mathrm{Ln}K_{t-1} + \delta_3 \mathrm{Ln}L_{t-1} + \delta_4 FDI_{t-1} + \delta_5 \mathrm{Ln}GEXP_{t-1} + \delta_6 \mathrm{Ln}RXR_{t-1} + \\ & + \delta_7 \mathrm{Ln}INFL_{t-1} + \delta_8 FLBL_{t-1} + \sum_{i=1}^{p} \alpha_i \Delta \mathrm{Ln}Y_{t-i} + \sum_{i=0}^{q} \beta_j \Delta \mathrm{Ln}K_{t-j} + \sum_{i=0}^{q} \gamma_1 \Delta \mathrm{Ln}L_{t-1} + \sum_{i=0}^{q} \zeta_k \Delta FDI_{t-k} + \\ & + \sum_{i=0}^{q} \lambda_r \Delta \mathrm{Ln}GEXP_{t-r} + \sum_{i=0}^{q} \varphi_v \Delta \mathrm{Ln}RXR_{t-v} + \sum_{i=0}^{q} \theta_p \Delta \mathrm{Ln}INFL_{t-p} + \sum_{i=0}^{q} \phi_z \Delta FLBL_{t-z} + \varepsilon_t,\end{aligned} \quad (2)$$

where δ_i are the long run multipliers corresponding to long run relationships; c_0 are drifts; and ε_t are the white noise errors.

The short-run effects, therefore, will be captured by the coefficients of the first differenced variables in the UECM model. According to Bahmani-Oskooee and Brooks (1999), the existence of a long-term relationship derived from equation (1) does not necessarily imply that the estimated coefficients are stable. This suggests that there is a need to perform a series of diagnostic tests on the model established. This involves the testing of the residuals (i.e. homoscedasticity, non-serial correlation, etc.), as well as stability tests to ensure that the estimated model is statistically robust.

3.2. Empirical analysis. *3.2.1. Unit root tests for variables.* The results of the Dickey-Fuller generalized least squares (DF-GLS) and the Phillips and Peron (PP) unit-root tests for the relevant variables are reported in Tables 1 to 4 below. The DF-GLS lag length is selected automatically by AIC, whilst the PP truncation lag is selected automatically on the Newey-West bandwidth.

Table 1. DF-GLS unit root tests for the variables in levels

Variable	No trend	Result	Trend	Result
FDI	-2.444**	S	-3.130*	S
FLBL	-0.130	N	-1.752	N
Ln*GEXP*	-0.983	N	-1.805	N
Ln*INFL*	-3.570***	S	-3.905***	S
Ln*K*	-1.548	N	-1.794	N
Ln*L*	1.051	N	-2.329	N
Ln*RGDP*	-0.605	N	-2.511	N
Ln*RXR*	-0.789	N	-2.621	N

Notes: *, ** and *** denote the rejection of the null hypothesis at 10%, 5% and 1% significant levels respectively. S = Stationary and N = Non-stationary. Ln is the natural log operator.

Table 2. DF-GLS unit root tests for the variables in first differences

Variable	No trend	Result	Trend	Result
Δ*FLBL*	-4.275***	S	-4.372***	S
ΔLn*GEXP*	-4.246***	S	-4.791***	S
ΔLn*K*	-3.905***	S	-4.265***	S
Δ*L*	-6.167***	S	-6.442***	S
ΔLn*RGDP*	-1.708*	S	-3.840***	S

Table 2 (cont.). DF-GLS unit root tests for the variables in first differences

Variable	No trend	Result	Trend	Result
ΔLn*RXR*	-6.136***	S	-6.211***	S

Notes: S = Stationary and N = Non-stationary. Δ is the difference operator and Ln is the natural log operator. *, ** and *** denote the rejection of the null hypothesis at 10%, 5% and 1% significant levels, respectively.

Table 3. PP unit root tests for the variables in levels

Variable	No trend	Result	Trend	Result
FDI	-2.331	N	-3.076	N
FLBL	-0.401	N	-1.805	N
Ln*GEXP*	-0.824	N	-2.379	N
Ln*INFL*	-3.530**	S	-4.004**	S
Ln*K*	-1.414	N	-1.382	N
Ln*L*	0.019	N	-2.864	N
Ln*RGDP*	-0.327	N	-2.639	N
Ln*RXR*	-1.032	N	-2.831	N

Notes: *, ** and *** denote the rejection of the null hypothesis at 10%, 5% and 1% significant levels respectively. S = Stationary and N = Non-stationary. Ln is the natural log operator. The log of one plus the rates of inflation were used to diminish the impact of some outlier observations.

Table 4. PP unit root tests for the variables in first differences

Variable	No trend	Result	Trend	Result
Δ*FDI*	-8.321***	S	-8.217***	S
Δ*FLBL*	-4.332***	S	-4.265***	S
ΔLn*GEXP*	-9.111***	S	-8.948***	S
ΔLn*K*	-4.258***	S	-4.332***	S
ΔLn*L*	-6.401***	S	-6.328***	S
ΔLn*RGDP*	-4.038***	S	-3.956**	S
ΔLn*RXR*	-6.267***	S	-6.181***	S

Notes: S = Stationary and N = Non-stationary. Δ is the difference operator and Ln is the natural log operator. *, ** and *** denote the rejection of the null hypothesis at 10%, 5% and 1% significant levels, respectively.

As can be seen from Tables 1 to 4, all the variables are either *I*(0) or *I*(1), using both unit-root tests. The paper, therefore, rejects the null hypothesis that the variables are non-stationary.

3.2.2. ARDL-bounds test. The results of the co-integration test, based on the ARDL-bounds testing approach, are reported in Table 5.

Table 5. Bounds *F*-test for co-integration

Dependent variable	Function				*F*-test statistics	
Ln*Y* = Ln*RGDP*	F_{LnY} (Ln*Y*| Ln*L*, Ln*K*, *FDI*, Ln*GEXP*, Ln*RXR*, Ln*INFL*, *FLBL*)				3.934**	
Asymptotic critical values						
Pesaran et al. (2001, p. 301), Table CI(iv) Case IV	1%		5%		10%	
	I(0)	*I*(1)	*I*(0)	*I*(1)	*I*(0)	*I*(0)
	3.07	4.23	2.50	3.50	2.22	3.17

Note: ** Denotes statistical significant at the 5% level.

The results reported in Table 5 show that the null hypothesis of no co-integration among the variables has been rejected. This implies that there is a long run co-integration relationship amongst the variables used in this study. The long-run results of the selected model are reported in Table 6.

Table 6. Results of ARDL (1, 1, 1, 1,0, 0, 1, 0) long run model selected on AIC.

Regressor	Co-efficient	Standard error	T-ratio	Prob.
C	28.668	4.703	6.096	0.000
Ln*K*	0.055	0.050	1.096	0.283
Ln*L*	-5.966	1.348	-4.426	0.000
FDI	0.0495	0.027	1.844	0.077
Ln*GEXP*	-0.068	0.099	-0.690	0.496
Ln*RXR*	-0.178	0.105	-1.697	0.102
Ln*INFL*	0.251	0.266	0.943	0.354
FLBL	0.011	0.010	1.088	0.287

Notes: Dependent variable: Ln*Y* = Ln*RGDP*.

Table 6 shows that the coefficient of the real government expenditure (Ln*GEXP*) is statistically insignificant, but it has the expected a priori sign. The coefficient of inflation (Ln*INFL*) and that of the real export revenue (Ln*RXR*) are both statistically insignificant, but have unexpected signs. Furthermore, the coefficient of the combined financial liberalization index (*FLBL*), which serves as the proxy of changes and implementation of the policy has a positive sign, as expected; but it is statistically insignificant. The coefficient of foreign direct investments (*FDI*) has the expected positive sign; and it is statistically significant. The coefficient of real export revenue (Ln*RXR*) has the unexpected negative sign, and it is statistically insignificant. However, the negative relationship between real export and economic growth may suggest the existence of the "immiserizing growth" effect (Bhagwati, 1958) in the Ivorian Economy[1]. Also the negative relationship between the labor factor and economic growth may suggest that a 1% increase in the labor force will lead to a reduction of about 5.97% in economic growth. This relationship may indicate the growing unemployment problem and the low productivity of labor in the country, resulting from political instability, economic meltdown and civil wars.

[1] Note that Ivory Coast is the largest exporter of cocoa bean whilst Ghana is the second largest exporter.

Another interesting finding is the insignificant relationship between financial liberalization and economic growth in the long run. This may suggest that for Ivory Coast, the effect of financial liberalisation is non-existent. This may be due to the fact that, as Ivory Coast is a primary commodity exporter, export revenue contributes significantly to economic growth – more than financial policies. The effect is that, the impact of financial liberalisation policies is somehow obscured in the economic growth process in Ivory Coast. Also, one other reason may be the underdeveloped nature of the financial sector in Ivory Coast. The short-run dynamics of the model are shown in Table 7.

Table 7. Results of ARDL (1, 1, 1, 1, 0, 0, 1, 0) ECM model selected on AIC

Regressor	Co-efficient	Standard error	*T*-ratio	Prob.
$\Delta \text{Ln}K_{-1}$	0.068	0.020	3.369	0.002
$\Delta \text{Ln}L_{-1}$	-4.514	0.598	-7.545	0.000
ΔFDI_{-1}	0.004	0.005	0.782	0.440
$\Delta \text{Ln}GEXP_{-1}$	-0.019	0.028	-0.697	0.491
$\Delta \text{Ln}RXR_{-1}$	-0.050	0.026	-1.884	0.069
$\Delta \text{Ln}INFL_{-1}$	-0.014	0.059	-2.291	0.029
$\Delta FLBL_{-1}$	0.003	0.003	1.074	0.291
Ecm (-1)	-0.280	0.061	-4.632	0.000
R-squared	0.906	*R*-Bar-squared	0.862	
S.E. of regression	0.016F-Stat.	*F*(8,30)	31.125[0.000]	
Residual sum of squares	0.007	DW-statistic	2.163	
Akaike Info. criterion	100.493	Schwarz Bayesian Criterion	89.680	

Notes: Dependent variable: $\Delta \text{Ln}Y = \Delta \text{Ln}RGDP$.

The coefficients of $\Delta \text{Ln}L_{-1}$, $\Delta \text{Ln}K_{-1}$, ΔLnRXR_{-1} and $\Delta \text{Ln}INFL_{-1}$ are all statistically significant. But the coefficients of ΔFDI_{-1}, $\Delta \text{Ln}GXEP_{-1}$ and $\Delta FLBL_{-1}$ are all statistically insignificant. The coefficient of ECM(-1) is found to be statistically significant at a 1% level, with the expected negative sign. This confirms the existence of a long-run relationship between the variables. The coefficient of ECM (-1) term is -0.28, which suggests a relative slow rate of adjustment process. The magnitude of the coefficient of the ECM(-1) implies that the disequilibrium occurring due to a shock is totally corrected in about 3 years and 7 months at a rate of 28.0% per annum.

Finally, the regression for the ARDL model fits very well at *R*-square = 99.7%; passed all the diagnostic tests at 5%, as shown in Table 8. Furthermore, an inspection of the cumulative sum (CUSUM) and the cumulative sum of squares (CUSUMSQ) graphs (see Figures 1 and 2) from the recursive estimation of the model, indicates that there is stability; and there is no systematic change detected in the coefficient at a 5% significance level over the sample period.

Table 8. Economic growth and financial liberalization − ARDL-VECM model diagnostic tests

LM Test statistics	Results
Serial correlation: CHSQ(1)	0.447 [0.504]
Functional form: CHSQ(1)	0.024 [0.878]
Normality: CHSQ(2)	0.111 [0.961]
Hetroscedasticity: CHSQ(1)	1.073 [0.300]

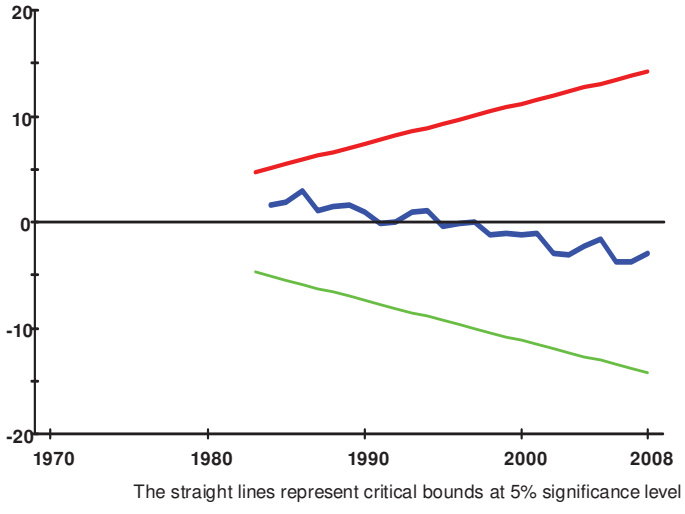

Fig. 1. Plot of CUSUM for coefficients stability for ECM model

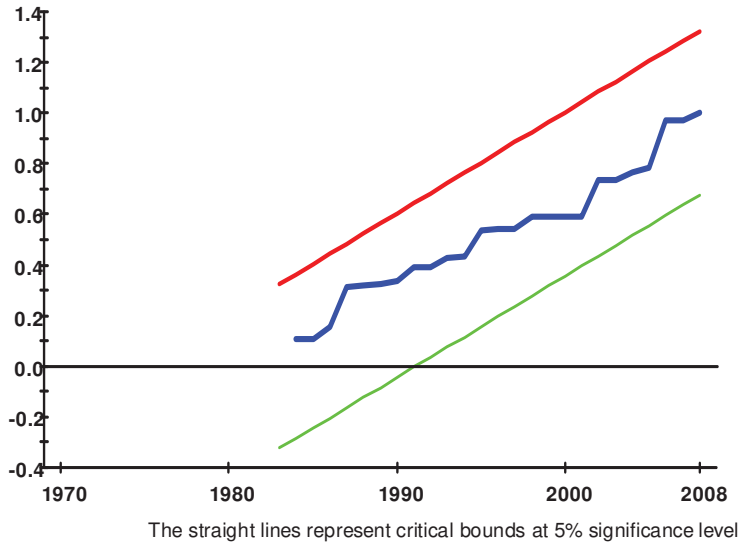

Fig. 2. Plot of CUSUMSQ for coefficients stability for ECM model

Conclusion

The main objective of this paper is to empirically examine and investigate the impact of financial liberalization policies on economic growth in Ivory Coast. We employ the ARDL-bounds testing approach and unrestricted error-correction model (UECM) to establish the long run relationship between the relevant time series variables. We also incorporate a multi-dimensional financial liberalization index constructed from a number of financial liberalization policy measures, implemented as a result of the financial liberalization process in Ivory Coast. The unit root tests employed suggest that all the variables were found to be either $I(0)$ or $I(1)$. The empirical findings show that the effects of financial liberalization policies on economic growth are negligible in the short run as well as in the long run. This finding, though contrary to the expectation of our study, is consistent with the works of Boamah et al. (2007) for the case of four Caribbean countries, Bashar and Khan (2007) for the case of Bangladesh and Wizarat and Adnan-Hye (2011) for the case of Pakistan. The empirical findings also show that, it is rather the increase in foreign direct investment which is the main driver of economic growth in Ivory Coast in the long run, and not the implementation of financial liberalization policies, or improvement in the financial sector. Moreover, the negative relationship between export revenue and economic growth seems to suggest the existence of immiserizing growth in the Ivorian economy but further investigations are required to confirm this.

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