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## Capital Account Liberalization and Economic Growth in Developing Economies: An Empirical Investigation

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# Working Papers on Global Financial Markets

No. 40

## Capital Account Liberalization and Economic Growth in Developing Economies: An Empirical Investigation

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## Capital Account Liberalization and Economic Growth in Developing Economies: An Empirical Investigation

### Abstract:

The objective of this paper is to investigate the empirical relationship between capital account liberalization and economic growth in three Maghreb countries (Algeria, Morocco, and Tunisia) using the GMM technique. The study of this relationship has always been of particular interest (*Alesina and al 1994; De Gregorio 1996; Edwards 2001; Agénor 2001; Ishii and Habermeier 2002; Prasad and al. 2003; Buiter and Taci 2003; Henry 2007; Dhrifi 2009; Eichengreen, Gullapalli and Panizza 2009; Bakare A. S. 2011; Vithessonthi and Tongurai 2012*). The results are mitigated and can be classified into two categories: negative and positive effects. As a matter of fact, some authors have showed that capital account liberalization hasn't a significant effect on economic growth (*Grilli and Milesi-Ferretti 1995; Rodrick 1998; Kraay 1998; O'Donnell 2001; Edison and al. 2002*). On the contrary, several theoretical and empirical studies assert that capital account liberalization can help countries to improve significantly their economic growth rate (*Gurley and Shaw 1955, McKinnon 1973; Quinn 1997; Levine and Zervos 1998; Chan-Lau and Chen 2001; Bekaert and al. 2005; Levchenko and al. 2008; Mensi and al. 2010, Hassana, Sanchezb & Yu 2011*). The estimation results show that capital account liberalization is a good factor in fostering economic growth in Maghreb countries.

**Keywords:** capital account liberalization, financial development, economic growth, Maghreb countries, GMM technique.

**JEL Classifications:** E44, G20, F43, C33.

### Introduction

Since the end of the 1980s, emerging and developing countries have undertaken a series of reforms in order to liberalize their commercial and financial transactions. This process has taken three main forms: the deregulation of interest rates; the introduction of competition between the different channels of financing; and the external opening of financial system (capital account openness). One of the main benefits of this openness concerns the development of financial sector that will allow the domestic financial markets to become more sophisticated. In recognition of these potential benefits, developing countries have taken advantage of the favorable market environment to loosen

obstacles to capital mobility, implement structural policies and modernize banking and financial regulation in order to strengthen their financial systems and enhance economic growth.

In this context, the study of the relationship between capital account liberalization, financial sector development and economic growth has always been of particular interest (Quinn 1997; Levine and Zervos 1998; Chan-Lau and Chen 2001; Buiter & Taci 2003; Bekaert and al. 2005; Levchenko and al. 2008; Eichengreen, Gullapalli and Panizza 2009; Mensi and al. 2010, Hassana, Sanchezb & Yu 2011). Some economists consider that financial openness hasn't significant effects on financial sector stability and economic growth; it generates financial crisis (Rodrik 1998; Eichengreen 2001, Agenor 2003; Andersen & Tarp 2003); however, other studies indicate that capital account openness affect positively banking and financial system and enhance economic growth (Bailliu 2000; Chinn & Ito 2002; Klein & Oliver 2008; Quinn & Toyoda 2008).

The purpose of this work is to investigate the empirical relationship between capital account liberalization and economic growth in three Maghreb countries (Algeria, Morocco, and Tunisia) by addressing the following issue: *is capital account liberalization good for economic growth in Maghreb countries?* Using the GMM technique during the period 1970-2009, our empirical analysis conclude that external financial openness can allow Maghreb countries to develop their financial systems and obtain a long-run financial stability; thus, this process is a good factor in fostering economic growth in Maghreb countries.

The paper is organized as fallow. The 1<sup>st</sup> section provides an overview of literature on the link between capital account liberalization and financial sector development. Section 2 discusses the relationship between capital account openness and growth. The 3<sup>rd</sup> section highlights the characteristics of financial liberalization in Maghreb economies. Then, section 4 describes the data and the estimation methodologies and presents the empirical results.

## 1. Capital account liberalization and financial sector development

The capital account liberalization is a complex process; its success requires proper sequencing and coordination with macroeconomic and structural policies to strengthen the domestic financial system. Reflecting varying approaches and initial conditions, some countries have been able to liberalize their capital accounts while successfully maintaining financial sector stability, whereas other countries have experienced financial crises.

The predominant view in the literature exploring the relationship between financial development and economic growth is that increased availability of financial instruments reduces transaction and information costs in the economy. The basic argument in favour of financial openness is that it could lead to an increase in the size and depth of domestic financial markets (*McKinnon and Shaw 1973*) and increase the degree of efficiency in financial intermediation by lowering costs. Besides, *McKinnon and Pill (1997)* contend that, in the short run, better access to foreign funds may lead to increase investment rates, and thus temporarily higher growth. *Klein & Olivei (1999)* show that capital account openness leads to financial deepening, but only for advanced economies, leading them to suppose that emerging markets lack some key economic policies through which openness might act beneficially. However, *Eicher and Turnovsky (1999)* develop a model in which capital market imperfections, in the form of debt subsidies, lead to an initial acceleration in investment and growth but a subsequent increase in debt service costs and slower growth.

The initial conditions and the subsequent strategies and policies followed by different transition countries are important in explaining the level of development of the financial sector in transition countries. Some theoretical studies have contended that the main gains from openness may not occur from having access to foreign capital, but chiefly from the fact that the process of liberalizing results in a decrease of domestic distortions in economic reforms (*Gourinchas and Jeanne, 2002*). In this context, several studies have shown that the existence of a stable financial structure plays an enormous role in encouraging economic growth (*Nabi and Rajhi 2002*). In transition countries, the level of financial development is such that improving financial stability and reduc-

ing the vulnerability of financial systems remain essential policy challenges for all these countries. To achieve this goal, most transition economies have followed the same broad paradigm for the transformation of their banking sector (*Buiter and Taci 2003*). In general, the increasing integration of the transition countries into the international capital markets further reinforces the importance of removing the remaining structural problems and developing stable and efficient financial markets.

In addition, *Chinn and Ito (2002)* have also examined the link between capital account liberalization and financial development using aggregate data on a large sample of countries over the period 1977-1997. They find that the magnitude of the effect of financial openness is quite different between the less developed countries and emerging market group. In fact, both private credit and equity market variables are significantly associated with financial development in emerging markets. However, only stock market value traded is significantly affected by financial openness in less developed countries.

*Klein and Olivei (2005)* have analyzed a link from capital account liberalization to financial depth. They use a sample of 21 industrial countries (OECD) and 74 emerging and developing countries (non-OECD) over the period 1976 to 1995. They show that there is a statistically significant and economically relevant effect of open capital accounts on financial development and economic growth. These authors conclude that the benefits of capital account liberalization are not unconditional, but are likely to depend upon the environment in which the liberalization occurs.

Similar to Chinn and Ito study, *Baltagi & al. (2009)* address the empirical question of whether trade and capital account openness can help to explain the recent progress in financial development. Their empirical approach, based on annual data from developing and industrialized countries, uses dynamic panel estimation techniques and suggests that both types of openness (private credit and stock market capitalization) are statistically significant determinants of banking sector development. Their findings also suggest that there is no evidence to affirm that opening up capital account without opening trade could have a negative impact on financial sector development. In contrast, the financial openness (i.e. the removal of restrictions on international financial

transactions) was expected to attract foreign investment and to boost economic growth (Bakare A. S., 2011).

## 2. Capital account liberalization and economic growth

An overview of the literature shows that several studies have explored the link between capital account liberalization and economic growth. Despite the existence of numerous contributions over this link, results remain conflicting about whether financial openness plays a positive or a negative role in real economic growth. *King and Levine (1993 b)* indicate that several studies show that financial development is important to promote economic growth, even after controlling for a variety of indicators such as physical capital accumulation that have been usually considered as determinants of growth. *Obstfeld (1994)* indicates that financial liberalization can stimulate economic growth by improving the allocation of capital through risk sharing. In practice, empirical analyses use either *proxy variables for government restrictions on capital flows* or *measures of actual international capital flows*. The *Quinn's (1997)* study is one of the first works that deals with the relationship between capital account liberalization and economic growth. *Quinn (1997)* uses his own *proxy variable* to measure capital account restriction degree. Quinn's empirical estimates using a cross-section of 58 countries, over the period 1960 to 1989, give credit to the argument that capital account liberalization has a strongly significant effect on real per capita GDP growth.

Similarly, *Klein and Olivei (1999)* find that the effect of open capital accounts on financial deepness and economic growth in a cross-section of countries over the period 1986-1995 is statistically significant and economically relevant. But, this result is largely driven by the developed countries included in the sample. Furthermore, *Levine (2001)* shows that financial sector liberalization can strengthen domestic financial systems leading to more investment, better efficiency in the allocation of capital and higher growth. *Edwards (2001)* finds also that capital account liberalization leads to growth in higher income countries. In contrast, *Eichengreen (2001)* noted that various theoretical models imply inconsistent or weak effects from capital account liberalization. Financial systems have been weakened also by inappropriate government involvement

also face additional risks when operating in international financial markets (*Ishii and Habermeier 2002*). According to Ishii and Habermeier study's, an extensive public sector involvement in the financial sector in connection with capital account liberalization has been harmful in most, but not in all, instances.

In general, the neoclassical model confirms that liberalizing the capital account facilitates a more efficient international allocation of resources and produces all kinds of salubrious effects (*Henry 2007*). Theoretical models have identified a number of channels (direct and indirect) through which financial openness process can promote economic growth in developing countries. As such, this process can stimulate growth directly through risk sharing; Moreover, indirect positive effects of financial openness on economic growth could come through its effect on the development of domestic financial markets. This can be true via two channels (*Brezigar-Masten & al., 2008*): first, increased competition between foreign financial intermediaries can lead to reduced intermediation cost and can stimulate demand for funds which tends to increase the size of domestic financial markets. Moreover, financial liberalization can affect domestic markets through the improvements of institutional framework; in other words, improved regulation and corporate governance can enhance the overall stability and reduce asymmetric information problems. Second, financial openness affect positively and indirectly economic growth by allowing access to foreign financial markets in the form of direct lending by foreign financial intermediaries.

The economic literature suggests that financial development and capital flows liberalization are determining factors of economic growth because they provide a favorable support for financial integration between countries. In fact, there is more support for an effect of capital account liberalization in relaxing financing constraints when industry growth is measured by output than by value added and when the sample study is limited to countries at a high level of financial development (*Eichengreen B., and al., 2009*). In this regard, we can assert that capital flows play a crucial role, in terms of promoting economic growth and increasing the flows of domestic and foreign investment (*Alessandrini 2010*). In general, financial integration helps domestic financial systems to allocate resources optimally across industrial sectors in a way which im-



proves the overall diversification of the economy and lowers its volatility (*Manganelli and Popov, 2010*).

In contrast, many studies show that capital account liberalization hasn't a significant effect on economic growth. The *Grilli and Milesi-Ferretti (1995)* study has not confirmed the robust long-term effect of international financial liberalization on growth. In their empirical studies, they use a large sample of developing and developed countries and ended up by showing that the financial integration hasn't significant effects on economic growth. *Kraay (1998)* have not found a robust long-term growth effect of the IMF's restrictions measure on openness. *Rodrik (1998)* uses a sample of 100 developed and developing countries to study the effect of capital account liberalization on growth. He finds no significant effect of capital account liberalization on growth over the period 1975 to 1989.

In sum, financial liberalization gives an access opportunity to world capital markets, provides for a better allocation of savings and investment, and offers more sophisticated instruments to manage risks better. Also, as financial capital liberalization process has brought new global challenges to financial systems, it then prepares them to strengthen their macroeconomic fundamentals, revise their legal and regulatory frameworks, and improve the international financial architecture, by adopting a more active role within the global community of central banks, regulators and other authorities.

A large and growing body of work is summarized in Table 1.

**Table 1: Overview of studies on the impact of capital account liberalization on growth**

Studies	Countries	Period	Liberalization measures	Estimation Methods	Main results
Quinn (1997)	65 (20 advanced countries, 45 emerging economies)	1960-1989	IMF; QUINN index	Cross-section regressions	Capital account liberalization is robustly and positively associated with economic growth.
Klein & Oliver (1998)	93	1986-1995	IMF; SHARE	Cross-section; OLS; 2SLS	Capital account liberalization affects positively and significantly economic growth and financial depth in industrial countries.
Bailiu (2000)	40 developing countries	1975-1995	IMF	Dynamic panel data; GMM; OLS	International capital flows promote economic growth.

Edwards (2001)	61 to 65 (emerging economies and advanced countries)	1975-1997	IMF; NUYCO index; QUINN index	Weighted LS; Weighted TSTS	Capital account openness has positive effects on economic growth in advanced economies and negative effects at very low levels of local financial development.
Edison & al. (2002)	57	1980-2000	IMF; QUINN measure	OLS; 2SLS; GMM; dynamic panel; cross-section	International financial liberalization does not significantly affect economic growth.
Bekaert & al. (2005)	95 and 75 countries	1980-1997	IMF; QUINN measure	OLS; GMM; cross-section;	Equity market liberalizations increase real economic growth.
Brezigar-Masten & al. (2007)	31 European countries	1996-2004	IMF	GMM; cross-country panel	Financial market liberalization affects positively economic growth.
Honig (2008)	122	1970-2005	IMF; QUINN (1997); Chinn & Ito (2007)	OLS; instrumental variables	Capital account liberalization has significant positive effect on economic growth.
Xiu Yang (2010)	83 (44 developed countries and 39 emerging countries)	1960-2008	IMF measure	GMM	Financial liberalization promotes real economic growth.
Hassana & al (2011)	166 countries	1980-2007	Proxy measures	VAR Cross section	Positive relationship
Vithessonthi & Tongurai (2012)	242 non-financial firms listed on the Stock Exchange of Thailand	2007	Stock returns	OLS	They find the existence of a positive and significant effect.

"IMF" restriction measures on capital transactions published by the *International Monetary Fund* in its *Annual Report on Exchange Arrangements and Exchange Restrictions*.

"QUINN index" measures capital account liberalization's intensity; it's comprised between 0 and 4.

"SHARE" represents the proportion of years in which the country had liberalized capital account.

"NUYCO index" measures the *degree of capital mobility*; it can take values goes from 0 through 4, with increments of 0.5. A higher value of this index denotes a higher degree of capital mobility.

"OLS": Ordinary Least Squares estimator.

"2SLS": Two-Stage Least Squares estimator.

"Weighted LS": Weighted Least Squares.

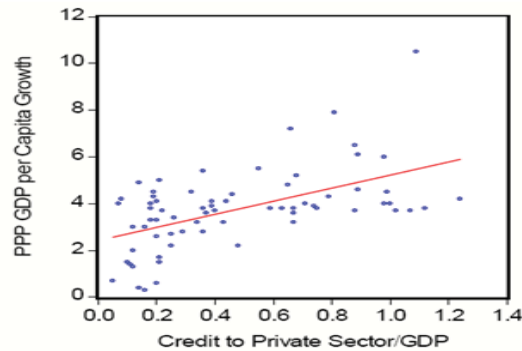
"Weighted TSLS": Weighted Three Stages Least Squares.

### 3. Overview of financial systems in the Maghreb region

The financial sector plays a crucial role in the process of capital accumulation and productivity growth. In recent years, Maghreb countries are well aware of the importance of modernizing their financial sectors and have been implementing reforms for some time, with encouraging results. These countries have established a council to coordinate and harmonize their development plans as well as interregional trade. The five Maghreb countries (Algeria, Libya, Mauritania, Morocco, and Tunisia) signed a treaty in 1988 with the objective of safeguarding the region's economic interests, fos-

tering and promoting economic and cooperation, and intensifying mutual commercial exchanges as a precursor for integration and the creation of a North African Common Market (*Russo and Ugolini 2008*). The main characteristics of the financial systems in these countries include the following (*Tahari and al, 2007*): (a) bank dominance and heavy public sector presence in most countries; (b) limited financial sector openness; (c) public banks burdened with inefficiencies and a high level of nonperforming loans; (d) shortcomings in the legal, regulatory, and supervisory frameworks; and (e) a largely cash-based payment systems that is being modernized.

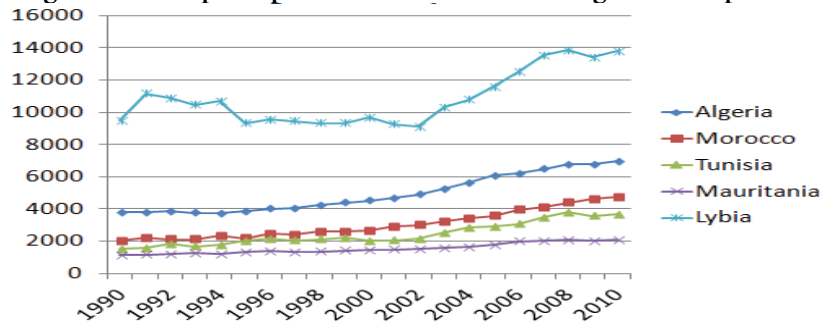
Figure 1: Financial Development and Growth



Source: Amor Tahari, Patricia Brenner & al (2007)

This figure shows a positive relationship between financial depth (measured by average credit to the private sector divided by GDP) and growth (measured by average growth of GDP per capita in PPP terms). Each observation corresponds to a particular country.

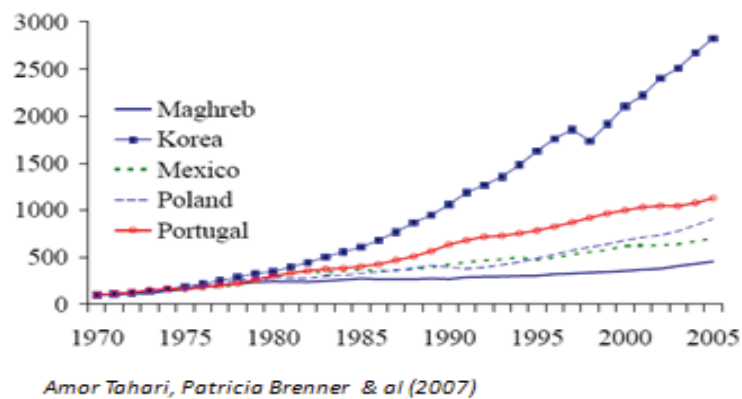
Figure 2: GDP per capita in PPP terms Intra-Maghreb Comparison



Source: International Monetary Fund, World Economic Outlook Database, April 2011

This figure show that the aggregate of growth performance conceals important differences between the five countries, reflecting not only differences in initial economic, social, and political conditions but also differences in pace and strength of economic reform. Thus, countries that have implemented deeper and broader structural reforms have reaped the highest growth dividend.

Figure 3: GDP per capita in PPP terms - International Comparison



The five Maghreb countries are at various stages of economic development and have different endowments of natural resources. This figure shows that the growth dividend has been relatively modest: growth in GDP per capita in purchasing power parity (PPP) terms in the Maghreb has accelerated somewhat during the past decade but it has been weaker than in some other emerging market economies.

Furthermore, the capital account liberalization process in the Maghreb countries, as for other African countries, can yield benefits via three channels. First, it provides a powerful incentive for domestic financial reforms. Second, it increases the efficiency and profitability of the financial institutions by increasing their scale of operations. Third, it ensures the growth of indigenous financial institutions into regional and global players by increasing their competitiveness in the area of globalization (*The African Development Bank Report, 2009*).

Finally, we can say that the economic reforms that have been undertaken in all Maghreb countries over the past two decades have generally achieved macroeconomic stability and contributed to raising growth in some countries. Despite these developments, financial sectors of these countries still need further modernization and region-

al and global integration. Some of the necessary reforms would also facilitate financial integration in the region (*Russo & Ugolini 2008*): (i) strengthen the soundness of the banking systems in all the five countries, (ii) increase competition in the banking systems, (iii) deepen the financial markets, (iv) strengthen financial sector oversight, and (v) upgrade financial sector infrastructure.

## 4. Empirical analysis

### 4.1 Methodology and data

#### 4.1.1 Descriptive data

The data are drawn from a number of sources, primarily the World Bank's World Development Indicators, the IMF's International Financial Statistics, the CNUCED, UNCTAD stat, the Statistical Economic and Social Research and Training Centre for Islamic Countries (SESRIC), and The Chinn-Ito index (2009). The analysis is based upon data originally recorded at an annual frequency, over the period 1970-2009, covering three Maghreb countries.

#### 4.1.2 Methodology

We use the recent developments in time series econometrics to analyze and determine causal relationships between capital account liberalization and economic growth in the three Maghreb countries (Algeria, Morocco, and Tunisia); we first examine long-run equilibrium (cointegration) relationship among their respective per capita gross domestic product (GDP). Then, we use the dynamic panel system GMM estimator proposed by Blundell and Bond (1998). This approach will be applied using three different econometric methods with fixed effects, Ordinary Least Squares method (OLS), Two Stages Least Squares method (TSLS), and Generalized Method of Moments (GMM).

## 4.2 Regression specification

From the examination of theoretical and empirical literature review, aimed to study the effect of financial integration on economic growth, we specify the model of our study. It is as follows:

$$Y_{i,t} = \alpha FDI_{i,t} + B FDev_{i,t} + \delta TO_{i,t} + \lambda Kaopen_{i,t} + \varepsilon_{i,t} \quad i = \{1, \dots, N\}$$

where  $Y_{i,t}$  is the endogenous variable of the model; it represents the logarithmic growth in real GDP per capita for country  $i$  in year  $t$ , and  $N$  includes 3 developing Maghreb countries: Algeria, Morocco, and Tunisia. Analysis covers the period 1970-2009.  $FDev_{i,t}$  represents Money Supply as a share of per capita GDP; it measures the development of financial system.  $FDI_{i,t}$  represents Foreign Direct Investment as a share of GDP; it's used to measure the inflows of capital.  $TO_{i,t}$  variable represents Trade Openness of the 3 Maghreb countries; it measures the openness degree of financial system.  $Kaopen_{i,t}$  variable measures the extent of openness in capital account transactions.  $\varepsilon_{i,t}$  is the error term.

## 5. Estimation Results

Using the econometric methods outlined above, this section presents regression results about the relationship between international financial integration and economic growth. Table 2 assembles the results from the Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) tests over the estimation period 1970-2009.

Table 2: Unit Root Test Results (sample period: 1970–2009)

ADF Test		PP Test	
Variables "in 1 <sup>st</sup> Differences"	t-Statistic	Variables "in 1 <sup>st</sup> Differences"	t-Statistic
Y_a	-3.843***	Y_a	-4.067***
Y_m	-8.895***	Y_m	-9.156***
Y_t	-3.962***	Y_t	-3.894***
FDev_a	-4.851***	FDev_a	-4.859***
FDev_m	-4.961***	FDev_m	-4.861***
FDev_t	-4.346***	FDev_t	-4.249***
FDI_a	-12.072***	FDI_a	-11.762***
FDI_m	-9.998***	FDI_m	-13.266***
FDI_t	-7.917***	FDI_t	-19.609***
TO_a	-5.104***	TO_a	-4.079***
TO_m	-6.119***	TO_m	-6.119***
TO_t	-4.851***	TO_t	-4.998***
Kaopen_a	-10.719***	Kaopen_a	-9.952***
Kaopen_m	-6.000***	Kaopen_m	-6.251***
Kaopen_t	-6.000***	Kaopen_t	-6.000***

A: Algeria, M: Morocco, T: Tunisia, Y: Gross Domestic Product, X: Financial Development measured by M2 to per capita GDP, Z: Foreign Direct Investment (FDI) to GDP, TO: Trade Openness.

\*\*\*: variable stationary at significant levels at 1%, 5%, and 10%.

From the Table 2, we observe that both ADF and PP tests suggest that all variables representing the three Arab Maghreb countries are nonstationary in level (i.e., all series contain unit roots). These variables become stationary at 1<sup>st</sup> differences in both ADF and PP tests. Thus, each variable is integrated of the first-order, commonly dubbed as I (1).

Besides, table 3 reports the Johansen test results. Panel A presents the GDP cointegration results of the three countries, panel B gives the results for the financial development, panel C reports the capital inflows using Johansen test, panel D presents cointegration trade openness results, and panel E reports kaopen cointegration test.

Table 3: The Johansen Cointegration test results (sample period: 1970–2009)

Null hypotheses	The Trace Test				The Maximal Eigenvalue Test			
	Alternative hypotheses	Test statistics	CV (5%)	CV (1%)	Alternative hypotheses	Test statistics	CV (5%)	CV (1%)
<b>Panel A: Cointegrating system <math>Y_a, Y_m, Y_t</math></b>								
$r = 0$	$r \geq 1$	32.52**	29.79	30.45	$r = 1$	22.31**	21.13	21.86
$r \leq 1$	$r \geq 2$	10.20	15.49	19.93	$r = 2$	8.65	14.26	18.52
$r \leq 2$	$r = 3$	1.55	3.84	6.63	$r = 3$	1.55	3.84	6.63
<b>Panel B: Cointegrating system <math>FDev_a, FDev_m, FDev_t</math></b>								
$r = 0$	$r \geq 1$	37.29**	29.79	35.45	$r = 1$	25.15**	21.13	23.86
$r \leq 1$	$r \geq 2$	14.14	15.49	19.93	$r = 2$	11.65	14.26	18.52
$r \leq 2$	$r = 3$	0.53	3.84	6.63	$r = 3$	0.53	3.84	6.63
<b>Panel C: Cointegrating system <math>FDI_a, FDI_m, FDI_t</math></b>								
$r = 0$	$r \geq 1$	18.95	29.79	35.45	$r = 1$	11.59	21.13	25.86
$r \leq 1$	$r \geq 2$	7.36	15.49	19.93	$r = 2$	5.74	14.26	18.52
$r \leq 2$	$r = 3$	1.61	3.84	6.63	$r = 3$	1.61	3.84	6.63
<b>Panel D: Cointegrating system <math>TO_a, TO_m, TO_t</math></b>								
$r = 0$	$r \geq 1$	18.85	29.79	35.45	$r = 1$	11.34	21.13	25.86
$r \leq 1$	$r \geq 2$	7.50	15.49	19.93	$r = 2$	6.67	14.26	18.52
$r \leq 2$	$r = 3$	0.82	3.84	6.63	$r = 3$	0.82	3.84	6.63
<b>Panel E: Cointegrating system <math>Kaopen_a, Kaopen_m, Kaopen_t</math></b>								
$r = 0$	$r \geq 1$	27.74	29.79	35.45	$r = 1$	18.63	21.13	25.86
$r \leq 1$	$r \geq 2$	9.11	15.49	19.93	$r = 2$	8.23	14.26	18.52
$r \leq 2$	$r = 3$	0.87	3.84	6.63	$r = 3$	0.87	3.84	6.63

$r$  denotes the number of the cointegration rank.

\*\* Rejection of the hypothesis at the 5% level.

The observation that we can check from the table above is that both the trace and the maximal eigenvalue statistics of the cointegration test are sufficiently large to reject the null hypothesis in the three panels at the 5% level of significance; this result applies



only for GDP (Y variable) and FDev. This means that the cointegration approach shows a strong long-run relationship between economic growth and the development of banking system for the three countries.

On the other hand, cointegration tests of the five variables for each country give us the results interpreted in the following equations:

**Algeria:**  $Y = 0.132 FDev - 0.205 FDI + 2.974 TO - 0.402 Kaopen$

**Morocco:**  $Y = 0.120 FDev + 0.285 FDI + 1.909 TO + 0.007 Kaopen$

**Tunisia:**  $Y = 0.259 FDev + 0.471 FDI + 0.941 TO - 0.578 Kaopen$

The empirical analysis using the dynamic panel GMM method gave the results reported in Tables 4, 5 and 6.

**Table 4: Capital account liberalization and growth: Least Squares method (LS)**

Variables	Algeria	Morocco	Tunisia
Financial Development	6.521*** (0.079)	3.073** (0.117)	5.937*** (0.046)
FDI	- 4.612*** (0.030)	0.198* (0.044)	2.019* (0.044)
Trade Openness	3.595*** (0.207)	7.949*** (0.169)	5.185*** (0.031)
Kaopen	- 2.800* (0.337)	0.643* (0.140)	- 0.264* (0.084)

Dependant variable: growth rate of real per capita GDP. (\*\*\*), (\*\*) and (\*) indicate statistical significance at the 1%, 5% and 10% level, respectively.

**Table 5: Capital account liberalization and growth: Two-Stage Least Squares method (TSLS)**

Variables	Algeria	Morocco	Tunisia
Financial Development	6.447*** (0.041)	3.124** (0.097)	7.967*** (0.131)
FDI	- 4.062*** (0.023)	0.195* (0.138)	1.819* (0.087)
Trade Openness	2.876*** (0.277)	5.886*** (0.096)	5.665*** (0.052)
Kaopen	- 2.948* (0.283)	0.648* (0.114)	- 0.314* (0.124)

Dependant variable: growth rate of real per capita GDP. (\*\*\*), (\*\*) and (\*) indicate statistical significance at the 1%, 5% and 10% level, respectively.

Table 6: Capital account liberalization and growth: Generalized Method of Moments (GMM)

Variables	Algeria	Morocco	Tunisia
Financial Development	6.668*** (0.091)	3.228** (0.089)	5.133*** (0.023)
FDI	- 4.579*** (0.012)	0.212* (0.068)	1.468* (0.087)
Trade Openness	3.776*** (0.196)	7.198*** (0.137)	5.468*** (0.044)
Kaopen	- 2.768* (0.323)	0.662* (0.143)	- 0.301* (0.106)

Dependant variable: growth rate of real per capita GDP. (\*\*\*), (\*\*) and (\*) indicate statistical significance at the 1%, 5% and 10% level, respectively.

Interestingly, the effect of financial development is positive and statistically significant at the 99% level of confidence in the three countries and in all specifications (LS, TSLS, and GMM), suggesting a strong, positive link between financial sector development and economic growth, i.e., financial system development the financial sector development, particularly the banking sector, plays a crucial role in improving the levels of economic growth of the three Maghreb countries.

We can check also the observation that Foreign Direct Investment (FDI) is an important factor which contributes to increase economic growth of Morocco and Tunisia; however, the contribution of FDI in Algerian economic growth is significantly negative. Moreover, results show that *TO* (which is one of important components of capital account liberalization) promotes economies of the three countries. Besides, the openness of capital account transactions (*Kaopen*) affects positively and significantly economic growth of Morocco; nevertheless, its impact on economic growth of Algeria and Tunisia is negative. We conclude that capital account liberalization and financial development improve the level of economic growth in the Maghreb countries. Finally, we can assert that countries with higher initial per capita GDP have a developed and deepened banking and financial system.

## Conclusion

After reviewing theoretical and empirical literature on the relationship between capital account liberalization, financial development and economic growth, this paper exam-

ines empirically this relationship in three Maghreb countries using the dynamic panel system GMM estimator over the period 1970-2009. The evidence suggests that there is a positive relationship between the degree of capital account liberalization and economic growth. We assert that even though some variables are unsuccessful in explaining economic growth of Maghreb countries, the analysis indicates that these variables (such as trade openness and foreign direct investment) are important factors to increase economic growth. In sum, the main result is that the beneficial effects of capital account openness on growth come mainly through fostering the development and the deepening of domestic financial system.

Finally, we can say that although the economy of each Maghreb country has achieved, these recent years, significant steps leading them to achieve higher level of development, it remains nevertheless that these countries should elaborate structural economic policies especially on the commercial, banking and financial plans. They must also remove all obstacles to free movement of persons, goods and capital, then create a common currency and establish a free trade area.

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## Appendix

**Description of the variables** (Available for all countries from 1970 through 2009)

Variable	Definition	Source
GDP growth	Growth of real per capita gross domestic product.	International Financial Statistics (IFS); The Statistical, Economic and Social Research and Training Centre for Islamic Countries (SESRIC).
FDI	Direct Foreign Investment flow as % of GDP. This variable measures the inflows of capital in countries.	CNUCED UNCTADstat
Financial development (M2, as a share of GDP)	Money and quasi money (M2) as % of GDP: comprises the sum of currency outside banks, demand deposits other than those of the central government, and the time, savings, and foreign currency deposits of resident sectors other than the central government. This variable measures financial market development.	IFS SESRIC Data base
TO	Trade Openness (Export and import volume of goods and services) as a share of GDP. This variable measure the openness degree of domestic banking and financial system.	SESRIC Data base
Kaopen	This variable measures the extent of openness in capital account transactions.	The Chinn-Ito index 2009

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