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## Capital Account Liberalization, Financial Development and Economic Growth in Presence of Structural Breaks and Cross-Section Dependence

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## Abstract

This paper aims at empirically investigating the long-run relationship between Capital Account Liberalization (hereafter CAL), financial development, the ratio of liquid liabilities to GDP, private credit by deposit money banks and other financial institutions, and economic growth in 79 developed and developing countries. By employing yearly data from 1983 to 2013, the panel econometric techniques of Westerlund and Edgerton (2008) with structural breaks and cross-section dependence approaches indicate that: Our results show a persistent positive long-run correlation between capital account liberalization and economic growth for OECD and Non OECD countries and CAL boosts more economic growth in advanced than emerging and developing because there's a well-functioning financial system.

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# Capital Account Liberalization, Financial Development and Economic Growth in Presence of Structural Breaks and Cross-Section Dependence

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## *Abstract*

This paper attempts to fill a gap in the existing literature in investigating the long-run relationship between Capital Account Liberalization (hereafter CAL), financial development and economic growth in a panel of 79 developed and developing countries during the period 1983-2013. Using recently developed panel econometric techniques of Westerlund and Edgerton (2008), the present paper takes into account structural breaks and cross-section dependence and regime shifts when analysing the CAL - growth nexus. We find, using the Fully Modified Ordinary Least Square (FMOLS) and the Dynamic Ordinary Least Square (DOLS), that CAL and economic growth are cointegrated and move together in the "long run". We demonstrate that capital account liberalization boosts growth in advanced countries but slows it in developing and emerging countries. Overall, the results support CAL in developed, emerging and developing economies.

# 1. Introduction

The process of financial liberalization of the last few decades dramatically changed the economic architecture worldwide. It is now widely accepted that restrictions and controls on inflows of external capital are a serious obstacle to development and economic growth. In the 1980's and 1990's, several developed and developing countries liberalized their economies for many reasons: i) financial liberalization help to improve the functioning of financial systems; ii) increase the availability of funds; ii) allow cross-country risk diversification; iv) promote transparency and accountability and reduce adverse selection and moral hazard.

Furthermore, the relationship between CAL, the last sequence of the chronology of financial liberalization, and its relation to economic growth has long been a topic of discussion in the literature. The empirical evidence on the effect of CAL on growth, however, is mixed at best. As pointed by Eichengreen et *al.* (2011), the growth effects of CAL are an issue that will not go away.

Many low, upper and middle countries have moved to relax and remove restrictions on capital flows. Regarding the effect of financial liberalization on economic growth Developing countries demonstrate more variation in their liberalization efforts compared to the advanced countries. Developing and emerging countries often lack the resources to develop their own technology and suffer from technical and institutional constraints to the accumulation of physical and human capital. Gehringer (2015) clearly show that total factor productivity growth is enhanced by financial integration. This positive effect of CAL is limited to countries with relatively well-developed financial systems, good accounting standards, strong creditor rights and rule of law and sound macroeconomic policies. Other empirical studies such as Demirguc-Kunt and Detragiache (1998), Daniel and Jones (2007), Kaminsky and Schmukler (2008), Demirgüç-Kunt et al. (2008) show a weak evidence of the positive effect of CAL on growth because financial globalization enhanced financial instability, exacerbated the adverse effects of negative shocks on economic growth and increased the likelihood of financial and banking crises.

Our study is pertinent for both policymakers and investors that pay a particular attention to the relationship between financial development and economic growth. Also, analyzing the long-run relationship between CAL and economic growth is of particular interest for financial players. So, considering both structural breaks cross-sectional dependence provide useful information about possible changes in different economies. Our results show that in the long-run CAL is associated with more growth for all countries. FDI and IP are generally thought to be an important factor of economic growth and development in developing countries.

The paper is organized as follows. Section 2 discusses related literature. Section 3 describes our data, empirical issues and presents our main results, whereas Section 4 concludes.

# 2. Theoretical framework for capital account liberalization and growth

The capital account liberalization can contribute to the development of a national financial system through different channels : i) the exposure to international competition can expand the efficiency of the national financial system ; ii) branches of foreign banks increase the national banking system and pioneer financial innovation ; iii) efficiency and scope of the financial sector gains may involve the pool of available savings both by eliciting higher national savings and by encouraging capital inflows.

The study of Edwards (2004) analyzed the relationship between restrictions to capital mobility and crises. Results show that countries with higher capital mobility tend to have a higher incidence of crises. In the same line, Bekaert et al. (2005) showed that capital

liberalization provided an opportunity for foreign investors to invest in domestic securities which led to an increase of 1% in economic growth.

The empirical investigations of Eswar et *al.* (2007) pointed to the existence of a positive correlation between current account balances and growth in industrialized countries, but they found no evidence that an increase in foreign capital inflows directly amplified growth. The removal of capital controls was behind the emergence of new investors in emerging economies (Carmignani 2008). Bussiere and Fratzscher (2008) examined 45 emerging countries between 1980 and 2002. Their results showed that opening capital account increased economic growth by 1.5% during the first five years.

Studding 114 developed and developing countries from 1970 to 1997, Yanikkaya (2008) investigated the contribution of CAL to economic growth, and concluded that capital entry, especially FDIs, started the process of development and growth in all countries. Besides, results show that countries receiving large FDIs and PIs inflows would achieve rapid growth. Rodrik (1998) and Klein and Olivei (2008) support the idea that a country that does not impose restrictions on capital flows is more likely to achieve rapid growth than one which is closed. International financial integration makes domestic financial systems highly dynamic with a very intense competitiveness and an importation of financial services that generate positive effects on growth.

The study by Butkiewicz and Yanikkaya (2008), covering the period (1970-1997) on a panel of 100 developed and developing countries, indicates that openness has a favorable long-term effect on growth in developed countries. They show also that restrictions on capital movements reduce the benefits of FDIs for growth in developing countries. Thus, economies characterized by higher long-term capital flows tend to grow faster. Schindler et al. (2009) confirmed that CAL had a long-term effect on capital account components, including FDI and portfolio investments (PI). Therefore, this had contributed to a high economic growth through direct effects in terms of job creation dynamics and technology transfer and indirect effects (spillover effects) on long-term productivity. The results of the study of 51 developed and developing countries between 1988 and 2002 by Choong et *al.* (2010) indicated that FDIs had a positive impact, while PIs had a negative impact on growth. The authors also concluded that the negative effect of private capital flows might become positive if the stock market reached a certain threshold of development.

Others empirical study find a strong support for the growth-enhancing hypothesis due in part to the potential welfare-enhancing effects for developing and emerging countries (Eswar et al., 2007; Henry, 2007 ; Butkiewicz and Yanikkaya, 2008 ; Diamandis, 2008 ; Carmignani , 2008 ; Levchenko et al., 2009 ; Schindler et al., 2009 ; Choong et al., 2010 ; Vithessonthi and Tongurai, 2012) ; Kunieda et al., 2014 ; Feeny et al., 2014, Almfraji and Almsafir, 2014 ; Delgado et al., 2014 and Gehringer, 2015). Gehringer (2013) suggest that financial liberalization occurred in the EU, influenced by economic growth, and its main sources, i.e. total factor productivity (TFP) and capital accumulation. More recently, Kunieda et al. (2014), CAL leads to a higher growth rate, and if government corruption is highly prevalent, CAL leads to a lower growth rate.

Our study differs from previous contributions in that we test the Relationship between Capital Account Liberalization, financial development and economic growth considering a developed panel econometric techniques of Westerlund and Edgerton (2008) with structural breaks and cross-section dependence and regime shifts when analyzing the CAL - growth nexus. We use the Fully Modified Ordinary Least Square (FMOLS) and the Dynamic Ordinary Least Square (DOLS) that CAL and economic growth are cointegrated and move together in the "long run". We demonstrate that capital account liberalization boosts growth in advanced countries but slows it in developing and emerging countries.

## 3. Data and Model

We consider the presence of multiple structural changes that might affect the series. Furthermore, we tackle the issue of cross-section dependence when computing panel databased statistics. The data set is a panel of 79 countries (27 OECD countries[*] and 52 Non-OECD countries[†]) spanning the period 1984-2013. We believe that the sample period is too large to catch the effect of capital account liberalization (CAL) on economic growth. Referring to Lee and Chang (2009), the model to estimate is as follow:

$$GDP_{it} = \alpha_i + \beta_i FDEV_{it} + \varphi_i CAL_{it} + \varepsilon_{it}$$

Where $i = 1, \ldots, N$ for each country in the panel, $t = 1, \ldots, T$ denotes the time period and $(\varepsilon)$ denotes the stochastic error term. The parameter $\alpha_i$ allows for the possibility of country-specific fixed effect.

Referring to Lee and Chang (2009), GDP is the Real gross domestic product. We have choose this measure and not the GDP growth because we are in non-stationary context.
FDEV is financial development and measured by liquid liabilities (LL) and private credit (PC). LL is the ratio of liquid liabilities to GDP. PC is private credit by deposit money banks and other financial institutions to GDP. Like Dilek et al. (2016), we used Bank Credit to control for credit market development, computed as the ratio of domestic credit to private sector to gross domestic product (GDP), which takes into account credit issued to the private sector, but not to governments. Like many previous studies, we used as a second indicator of financial development the ratio of liquid liabilities divided to GDP (Lee and Chang 2009; Law and Singh 2014; Moradbeigi and Law 2016).
CAL is the indicator of capital account liberalization measured by: CAL 1: "Foreign direct investment, net FDI inflows as a percentage of host country GDP" and CAL 2: "Portfolio investment (% of GDP)". These variables are de facto (quantity) and not de jure (rule-based) measures. According to Ahmed (2016), a major drawback of the mostly used de jure measures from International Monetary Fund Annual Report on Exchange Arrangements and Exchange Restrictions is that they "do not fully capture the degree of enforcement and effectiveness of capital controls" but quantity based indicators fully capture actual flows, level of enforcement and effectiveness of capital controls, and therefore provide a sensible picture of financial integration.
GDP and different measures of CAL are obtained from the World Bank (World Development Indicators) and the two measures of financial development are taken from the Financial Structure Database.

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[*] *OECD countries are Austria, Belgium, Canada, Chile, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Japan, Korea, Mexico, Netherlands, Poland, Norway, New Zealand, Portugal, Spain, Sweden, Switzerland, Turkey, United Kingdom, and United States of America.*
[†] *Non-OECD countries are : Albania, Argentina, Djibouti, Bahrain, Bangladesh, Romania, Georgia, India, Indonesia, Malaysia, Pakistan, Philippines, Sri Lanka, Thailand, Brazil, Bulgaria, Haiti, Honduras, Costa Rica, Colombia, Dominican Republic, Ecuador, El Salvador, Jamaica, Paraguay, Peru, Uruguay, Venezuela, Algeria, Egypt, Jordon, Morocco, Syrian Arab Republic, Trinidad and Tobago, Tunisia, Oman, Kuwait , Libya, Mauritania, United Arab Emirates, Burkina-Faso, Cote d'Ivoire, Kenya, Nigeria, Mali, Zambia, Zimbabwe, Ghana, Mozambique, Namibia and South Africa.*

## 3.1 Cross-section dependence tests

We applied the Pesaran's test of cross-section dependence (CD). Our results show that GDP, FDEV and CAL are highly dependent across-countries. The null hypothesis of cross section independence can be strongly rejected by a value of 38.60 for GDP (p-value = 0.001), 26.15 for FDEV (p-value = 0.000) and 32.43 for CAL (p-value = 0.001). This finding underlines the importance already mentioned of taking into account cross-section dependence when analyzing the CAL nexus growth[‡].

## 3.2 Panel unit root tests

The traditional panel unit root tests[§] are failures due to the omission of structural breaks. Thus, the consideration of structural breaks and, additionally, cross-section dependence like the test of Bai and Carrion-i-Silvestre (2009) should provide more reliable results. Table 1 provides the results without structural breaks and cross-section dependence and table 2 presents the results with structural breaks and cross-section dependence of panel unit root tests.

**Table 1. Panel unit root tests without structural breaks and cross-section dependence**

| | GDP | | PC | | LL | | CAL1 | | CAL2 | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Level | f-diff | Level | f-diff | Level | f-diff | Level | f-diff | Level | f-diff |
| **$H_0$: Unit root (assumes common unit root process)** | | | | | | | | | | |
| **LLC Stat** | 2.191 | -16.642 | -716.53 | -24.635 | -6211.9 | -30.439 | -12.70 | -38.44 | -13.31 | -27.16 |
| | 0.9858 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| **Breitung t-stat** | 11.202 | -2.835 | 2.675 | -18.117 | -2.583 | -22.849 | -11.536 | -3.241 | -7.21 | -13.51 |
| | 1.000 | 0.0023 | 0.996 | 0.000 | 0.004 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| **$H_0$ : Unit root (assumes individual unit root process)** | | | | | | | | | | |
| **IPS W-stat** | 7.704 | -17.719 | -107.41 | -26.625 | -947.80 | -31.012 | -11.109 | -42.789 | -13.95 | -30.73 |
| | 1.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| **Maddala-Wu ADF Fisher $\chi^2$** | 101.22 | 623.81 | 449.09 | 888.93 | 447.37 | 1227.81 | 389.20 | 1521.97 | 319.10 | 878.56 |
| | 0.999 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| **Maddala-Wu PP Fisher $\chi^2$** | 143.09 | 770.18 | 97.478 | 1728.43 | 171.70 | 1690.46 | 439.515 | 6121.96 | 795.72 | 4568.18 |
| | 0.762 | 0.000 | 1.000 | 0.000 | 0.0718 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| **$H_0$ : No unit root (assumes common unit root process)** | | | | | | | | | | |
| **Hadri Z-stat** | 18.028 | 11.920 | 19.99 | 1.023 | 10.075 | 83.175 | 12.124 | 13.323 | 5.487 | 9.283 |
| | 0.000 | 0.000 | 0.000 | 0.153 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

*Notes: Probabilities for the Fisher-type tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality. The choice of lag levels for the Breitung, IPS and Fisher-ADF test are determined by empirical realisations of the Schwarz Information Criterion. The LLC and Fisher-PP tests were computed using the Bartlett kernel with automatic bandwidth.*

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[‡] The CD tests are performed using the Stata routine "xtcsd" proposed by De Hoyos and Sarafidis (2006).

[§] see Levine, Lin and Chu, Im, Pesaran and Shin, Breitung, ADF-Fisher, PP-Fisher and Hadri.

**Table 2. Panel unit root test with structural breaks and cross-section dependence**
**Test of Bai and Carrion-i-Silvestre (2009)**

| Variables | GDP | PC | LL | CAL1 | CAL2 |
|---|---|---|---|---|---|
| **Constant and trend** | Z=0.46<br>P=31.25<br>$P_m$=-1.22 | Z=0.51<br>P=32.24<br>$P_m$=1.24 | Z=0.49<br>P=30.29<br>$P_m$=1.21 | Z=0.53<br>P=30.27<br>$P_m$=-1.21 | Z=0.51<br>P=30.48<br>$P_m$=-1.23 |
| **Mean shift** | Z=0.33<br>P=38.23<br>$P_m$=-0.79 | Z=-0.76<br>P=38.21<br>$P_m$=-0.80 | Z=-0.71<br>P=37.24<br>$P_m$=-0.82 | Z=0.29<br>P=36.23<br>$P_m$=-0.78 | Z=0.25<br>P=36.56<br>$P_m$=-0.74 |
| **Trend shift** | Z=0.21<br>P=42.32<br>$P_m$=-0.18 | Z=-1.04<br>P=44.41<br>$P_m$=0.16 | Z=-1.02<br>P=44.32<br>$P_m$=0.15 | Z=0.17<br>P=45.25<br>$P_m$=-0.19 | Z=0.24<br>P=46.20<br>$P_m$=-0.17 |

*Notes: The 1%, 5% and 10% critical values for the standard normal distributed Z and Pm statistics are 2.326, 1.645 and 1.282, while the critical values for the chi-squared distributed P statistic are 71.201, 62.830 and 58.641, respectively. The numbers of common factors are estimated using the panel Bayesian information criterion proposed by Bai and Ng (2002).*

In Levine, Lin and Chu (LLC), Im, Pesaran and Shin (IPS), Breitung, ADF Fisher, PP Fisher and Hadri tests, the first difference gives conclusive panel unit root evidence. We conclude that all variables used in this study are integrated of order one. Bai and Carrion-i-Silvestre (2009) test confirm the finding of non-stationarity in the variables. The null hypothesis of a unit root cannot be rejected for all tests in the model without any break, with a break in the mean and with a break in the trend.

## 3.3 Panel Co-integration tests

The long-run relationship between CAL and growth is analyzed by the panel cointegration technique of Pedroni (1999, 2004) and Westerlund and Edgerton (2008). The results are reported in tables 3 and 4.

**Table 3. Panel Co-integration test without dependencies and structural breaks**

| | | (1) | (2) | (3) | (4) |
|---|---|---|---|---|---|
| **Within Group** | **Panel v-stat** | 1.748<br>(0.040) | 1.34<br>(0.088) | 0.9376<br>(0.174) | 1.539<br>(0.031) |
| | **Panel rho-stat** | 4.303<br>(0.030) | 5.008<br>(0.042) | 3.941<br>(0.001) | 4.120<br>(0.880) |
| | **Panel pp-stat** | 2.540<br>(0.094) | 4.268<br>(0.020) | 3.099<br>(0.019) | 3.322<br>(0.009) |
| | **Panel- ADF-stat** | 1.197<br>(0.084) | 2.652<br>(0.096) | -0.397<br>(0.345) | 1.203<br>(0.005) |
| **Between Group** | **Group rho-stat** | 6.461<br>(0..070) | 6.299<br>(0.071) | 5.338<br>(0..062) | 6.009<br>(0..069) |
| | **Group-pp-stat** | 4.146<br>0.034) | 4.165<br>(0.037) | 3.157<br>(0.026) | 4.732<br>(0.047) |
| | **Group ADF-stat** | 0.565<br>(0.004) | 2.065<br>(0.018) | 0.665<br>(0.007) | 2.044<br>(0.016) |

*Notes : (1) GDP = f {PC, CAL1}, (2) GDP = f {LL, CAL1}, (3) GDP = f {PC, CAL2} and (4) GDP = f {LL, CAL2}*

*The null hypothesis is that the variables are not cointegrated. Under the null hypothesis, all the statistics are distributed as standard normal distributions. The finite sample distribution for the seven statistics has been tabulated in Pedroni (2004). The P-values are in parentheses.*

## Table 4. Panel Co-integration test with dependencies and structural breaks

| Model | (1) $z_\tau(N)$ | (1) $z_\phi(N)$ | (2) $z_\tau(N)$ | (2) $z_\phi(N)$ | (3) $z_\tau(N)$ | (3) $z_\phi(N)$ | (4) $z_\tau(N)$ | (4) $z_\phi(N)$ |
|---|---|---|---|---|---|---|---|---|
| No break | -11.421** | -21.335** | -4.223*** | -1.592*** | -6.544*** | -2.358*** | -10.275** | -19.224** |
| Mean shift | -7.254** | -16.156** | -2.211* | -1.488* | -3.584** | -1.264** | -6.347** | -5.658** |
| Regime shift | -2.441*** | -1.688*** | -2.612*** | -1.754*** | -3.578** | -2.369** | -5.656** | -4.257** |

*Notes : (1) GDP = f {PC, CAL1}, (2) GDP = f {LL, CAL1}, (3) GDP = f {PC, CAL2} and (4) GDP = f {LL, CAL2}*

*The test of Westerlund and Edgerton is implemented using the Campbell and Perron (1991) automatic procedure to select the lag length. We use three breaks, which are determined by grid search at the minimum of the sum of squared residuals. The P-values are for a one-sided test based on the normal distribution. The LM-based test statistics $z_\phi(N)$ and $z_\tau(N)$ are normal distributed. The number of common factors is determined by means of the information criterion proposed by Bai and Ng (2004) and the maximum number is set to 5. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level.*

The Pedroni test suggests evidence for a long-run equilibrium relationship between CAL and economic growth because the P-values are larger than 5%. The Westerlund and Edgerton test indicates that for both statistics $z_\phi(N)$ and $z_\tau(N)$ reveal evidence in favor of a long-run relationship between CAL, measured by FDI and IP, and growth when allowing for breaks in the level and the slope of this relationship.

### 3.4 The FMOLS and DOLS estimations

In view of the fact that the ordinary least squares (OLS) estimator is a biased and inconsistent estimator when applied to cointegrated panels, we estimate the long-run structural coefficients by using the fully modified OLS (FMOLS) procedure developed by Pedroni (1999) to generate consistent estimates and the dynamic OLS (DOLS) approach developed by Stock and Watson (1993). The results are reported in table 5.

## Table 5. Long-run estimates: All countries
### Dependent variable is Economic Growth

| Variables | FMOLS (1) | FMOLS (2) | FMOLS (3) | FMOLS (4) | DOLS (1) | DOLS (2) | DOLS (3) | DOLS (4) |
|---|---|---|---|---|---|---|---|---|
| PC | $-2.2^{E-05}$ | | $0.0096^{***}$ | | $-4.4^{E-05}$ | | $0.0053^{***}$ | |
|  | (-0.472) | | (7.868) | | (-1.104) | | (7.374) | |
| LL | | $-1.6^{E-06}$ | | $4.7^{E-06}$ | | $-2.1^{E-05}$ | | $1.31^{E-05}$ |
|  | | (-0.062) | | (0.205) | | (-0.682) | | (0.398) |
| CAL1 | $0.0115^{***}$ | $0.0100^{***}$ | | | $0.0112^{***}$ | $0.0142^{***}$ | | |
|  | (5.276) | (4.828) | | | (4.639) | (4.933) | | |
| CAL2 | | | $3.9^{E-08}***$ | $4.9^{E-08}***$ | | | $4.2^{E-08}***$ | $4.6^{E-08}***$ |
|  | | | (2.615) | (3.290) | | | (3.928) | (4.875) |
| Countries | 79 | 79 | 79 | 79 | 79 | 79 | 79 | 79 |

*Notes: Long-run covariance estimates (Bartlett kernel, Newey-West fixed bandwidth. The numbers in parentheses are value of t-statistics. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level.*

CAL coefficient measured by CAL1 and CAL2, is positive and statistically significant at the level of 1% across all regressions. There is a persistent positive long-run correlation between capital account liberalization and national income. CAL can amplify economic growth, which is consistent with our theoretical predictions (Henry, 2007, Carmignani, 2008, Honig 2008, Quinn and Toyoda 2008, Gehringer, 2015). This implies a strong, positive long-run relation between the FDIs and PIs. Flows of investments provide a number of benefits that enhance growth for all countries. FDI should, therefore, be an attractive source of development financing for all countries because Host developing countries have access to advanced

technologies, management practices, entrepreneurship, research and development – which are important for income. Overall, long-term growth in host countries is determined by flows of CAL. Findings indicates that countries receiving more foreign direct and portfolio inflows tend to grow faster. This result is quite consistent with some of the studies, such as Eswar et al. (2007), Butkiewicz and Yanikkaya (2008), Diamandis (2008), Levchenko et al. (2009), Schindler et al. (2009), Choong et al. (2010), Vithessonthi and Tongurai (2012), Kunieda et al. (2014), Feeny et al. (2014), Almfraji and Almsafir (2014), Delgado et al. (2014) that conclude, that CAL exerts positive effects on the host country's economic growth.

### 3.5 Robustness checks

To test whether CAL affects growth in advanced and emerging and developing countries differently, we estimate the model for the separate groups of countries (27 OECD countries and 52 Non-OECD countries) in order to solve for bias of heterogeneity. Consequently, it would be interesting to examine empirically whether the long-run effect of CAL on growth differs across countries. For the same equation, we estimate the long-run structural coefficients by using the FMOLS and the DOLS methods for the two subgroups.

### Table 6. Long-run estimates: Advanced countries: OECD countries
#### Dependent variable is Economic Growth

| Variables | FMOLS | | | | DOLS | | | |
|---|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (1) | (2) | (3) | (4) |
| PC | 0.0045*** | | 0.0042*** | | 0.0037*** | | 0.0039*** | |
| | (5.023) | | (3.782) | | (5.642) | | (4.672) | |
| LL | | 0.0089*** | | 0.0094*** | | 0.0083*** | | 0.0098*** |
| | | (6.771) | | (5.582) | | (8.347) | | (7.766) |
| CAL1 | 0.0048* | 0.0042*** | | | 0.0040* | 0.0061*** | | |
| | (1.792) | (5.331) | | | (1.680) | (5.937) | | |
| CAL2 | | | $1.29^{E-06}$*** | 0.0074* | | | $6.31^{E-06}$*** | 0.0019* |
| | | | (5.367) | (1.708) | | | (5.884) | (1.657) |
| Countries | 27 | 27 | 27 | 27 | 27 | 27 | 27 | 27 |

*Notes: OECD countries are Austria, Belgium, Canada, Chile, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Japan, Korea, Mexico, Netherlands, Poland, Norway, New Zealand, Portugal, Spain, Sweden, Switzerland, Turkey, United Kingdom, and United States of America. Long-run covariance estimates (Bartlett kernel, Newey-West fixed bandwidth. The numbers in parentheses are value of t-statistics. \*, \*\*, and \*\*\* indicate statistical significance at the 10%, 5%, and 1% level.*

### Table 7. Long-run estimates: Emerging and Developing and countries: Non-OECD countries
#### Dependent variable is Economic Growth

| Variables | FMOLS | | | | DOLS | | | |
|---|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (1) | (2) | (3) | (4) |
| PC | 0.0043*** | | 0.0049 | | 0.0040*** | | 0.0034 | |
| | (9.210) | | (0.060) | | (11.137) | | (0.267) | |
| LL | | 0.0084 | | 0.0014 | | 0.0078 | | 0.0041* |
| | | (0.745) | | (0.205) | | (1.141) | | (1.844) |
| CAL1 | 0.0462*** | 0.0477*** | | | 0.0457*** | 0.0465*** | | |
| | (6.505) | (6.928) | | | (7.639) | (8.438) | | |
| CAL2 | | | $1.033^{E-07}$** | $1.13^{E-08}$** | | | $9.39^{E-08}$** | $4.37^{E-08}$** |
| | | | (1.990) | (2.294) | | | (2.125) | (2.036) |
| Countries | 52 | 52 | 52 | 52 | 52 | 52 | 52 | 52 |

*Notes : Non-OECD countries are : Albania, Argentina, Djibouti, Bahrain, Bangladesh, Romania, Georgia, India, Indonesia, Malaysia, Pakistan, Philippines, Sri Lanka, Thailand, Brazil, Bulgaria, Haiti, Honduras, Costa Rica, Colombia, Dominican Republic, Ecuador, El Salvador, Jamaica, Paraguay, Peru, Uruguay, Venezuela, Algeria, Egypt, Jordon, Morocco, Syrian Arab Republic, Trinidad and Tobago, Tunisia, Oman, Kuwait , Libya, Mauritania, United Arab Emirates, Burkina-Faso, Cote d'Ivoire, Kenya, Nigeria, Mali, Zambia, Zimbabwe, Ghana, Mozambique, Namibia and South Africa.*
*Long-run covariance estimates (Bartlett kernel, Newey-West fixed bandwidth). The numbers in parentheses are value of t-statistics. \*, \*\*, and \*\*\* indicate statistical significance at the 10%, 5%, and 1% level.*

The estimates in tables 6 and 7 provide evidence of the growth effects of CAL. Results support capital account liberalization, especially for developed countries; the benefits of capital inflows, especially foreign direct investment (FDI) and portfolio investment (PI), are reduced in developing countries that control capital flows. This outcome is consistent with Edwards (2001), who finds that capital account liberalization boosts growth in developed countries but slows it in developing countries. Delgado et al. (2014) explain this result by the high level of corruption in developing countries. They outline in a study, containing 60 non-OECD countries over the period 1985–2002, that corruption sands the wheels by reducing the social returns to FDI in these countries.

Furthermore, financial markets have been liberalized dramatically in many developing countries and the crises of the 1990s in Asia and Latin America have re-ignited the debate on the effects of CAL on growth. Many studies in the banking crises literature pointed to CAL as one of the main causes for the occurrence of crises, especially in developing and emerging countries. As a result, CAL was associated with greater incidence of crises and this brought about an intense debate about the negative consequences of free capital movements and a huge destruction of economic activity.

It is clear that host countries need to attain a threshold level of financial development to benefit from CAL. All coefficients of financial development for advanced countries are statistically significant at the level of 1%. This finding is robust with Hermes and Lensink (2003), Choong et al. (2010), Eichengreen et al. (2011). Our results support the hypothesis that CAL increases growth only when a threshold level of financial development has been attained. It is argued that the existence of a well-functioning financial sector will assist the efficient allocation of capital, the mobilization of savings, the provision of vehicles for trading, the pooling and diversifying risk, the lowering of cost of gathering and processing information and the increase of specialization in production. Overall, we argue that, after controlling for cross-section dependence and deterministic trends and breaks in trade integration, the CAL appears to generate stronger effects in advanced than emerging and developing.

## 4. Conclusion

This paper has empirically tested the long-run linkages among capital account liberalization, financial development, the ratio of liquid liabilities, private credit by deposit money banks and other financial institutions, and economic growth in 79 developed and developing countries. To this end, *structural breaks and cross-section dependence* have been employed to detect the affect of concerned variables by employing yearly data between 1983 and 2013. Empirical findings methodologically show a persistent positive long-run correlation between capital account liberalization and economic growth for OECD and Non OECD countries. Besides, CAL boosts more economic growth in advanced than emerging and developing because there's a well-functioning financial system.

With our results in mind, some future research topics suggest themselves: This research can be extended by introducing other alternatives to CAL and introducing measures of institutions and governance. Given the vital role played by CAL and its importance to growth, all countries must strengthen institutions' quality to attract more foreign direct and portfolio investments. In countries with good institutions (political stability, maintenance of rule of law) and a lower level of corruption, CAL leads to a higher growth rate, and in countries where institutions are bad and corruption is highly prevalent, CAL leads to a lower growth rate.

**References**

1. Ahmed, A-D (2016) "Integration of financial markets, financial development and growth: Is Africa different? Int. Fin. Markets, Inst. and Money **42**, 43–59.

2. Almfraji, M.A. and Almsafir, M.K. (2014). "Foreign Direct Investment and Economic Growth Literature Review from 1994 to 2012", Procedia Social and Behavioral Sciences, Vol 129, pp 206-213

3. Bai, J and Carrion-i-Silvestre, J.L. (2009) "Structural changes, common stochastic trends, and unit roots in panel data", *Review of Economic Studies* **76**, 471-501.

4. Bekaert, G., Harvey, C.R and Lundblad, C. (2005). "Does financial liberalization spur growth?" *Journal of Financial Economics*, **77**, 3-55.

5. Breitung, J. (2000) "The Local Power of Some Unit Root Tests for Panel Data." In Baltagi (ed.), Nonstationary Panels, Panel Cointegration, and Dynamic Panels, Advances in Econometrics, JAI: Amsterdam **15**, 161-178.

6. Bussiere, M and Fratzscher, M. (2008) "Financial openness and growth: Short-run gain, Long-run pain?" *Review of International Economics* **16**, 69-95.

7. Butkiewicz, J.L. and Yanikkaya, H. (2008) "Capital account openness, international trade, and economic growth: A cross-country empirical investigation" *Emerging Markets Finance and Trade* **44**, N°7, 15-38.

8. Carmignani, F. (2008) "Does capital account liberalization promote economic growth? Evidence from system estimation" *Economics Bulletin* **6**, N°49, 1-13.

9. Choong.Ch.K, Baharumshah.A.Z, Yusop.Z and Habibullah.M.S, (2010) "Private capital flows, stock market and economic growth in developed and developing countries: A comparative analysis" *Japan and the World Economy* **22**, 107-117.

10. Daniel, B.C and Jones, J.B. (2007) "Financial liberalization and banking crises in emerging economies" *Journal of International Economics* **72**, 202-221.

11. De Hoyos, R.E. and Sarafidis, V. (2006) "Testing for Cross-sectional Dependence in Panel Data Models" *The Stata Journal* **6**, 482-496.

12. Delgado, M.S., McCloud, N and Kumbhakar, S.C. (2014) "A generalized empirical model of corruption, foreign direct investment, and growth" *Journal of Macroeconomics* **42**, 298-316.

13. Demirgüç-Kunt, A., Detragiache, E. and Tressel, T. (2008) "Banking on the principles: Compliance with Basel Core Principles and bank soundness" *Journal of Financial Intermediation* **17**, 511-542.

14. Diamandis, P.F. (2008) "Financial liberalization and changes in the dynamic behaviour of emerging market volatility: Evidence from four Latin American equity markets" *Research in International Business and Finance* **22**, 362-377.

15. Dilek, D-C, Serdar, I.M & Hakan, Y. (2016) "Financial Development and Economic Growth: Some Theory and More Evidence" *Journal of Policy Modeling forthcoming.*

16. Edwards, S., (2004) "Financial openness, sudden stops, and current account reversals" NBER working paper number 10277, 1-15.

17. Eichengreen, B., Gullapalli, R. and Panizza, U. (2011) "Capital account liberalization, financial development and industry growth: A synthetic view" *Journal of International Money and Finance*, **30**, 1090–1106.

18. Eswar, S.P and Shang-Jin.W (2007) "The Chinese approach to capital inflows: patterns and possible explanations" NBER Chapters, in: Capital Controls and Capital Flows in Emerging Economies: Policies, Practices and Consequences, 421-480.

19. Feeny, S., Iamsiraroj, S. and McGillivray, M (2014) "Growth and Foreign Direct Investment in the Pacific Island countries" *Economic Modelling*, **37**, 332-339.

20. Gehringer, A. (2013) "Growth, productivity and capital accumulation: The effects of financial liberalization in the case of European integration" *International Review of Economics and Finance* **25**, 291-309.

21. Gehringer, A. (2015) "Uneven effects of financial liberalization on productivity growth in the EU: Evidence from a dynamic panel investigation" *International Journal of Production Economics*, **159**, 334-346.

22. Ghosh, C., Harding, J. & Phani, B.V. (2008) "Does liberalization reduce agency costs? Evidence from the Indian banking sector" *Journal of Banking and Finance* **32**, 405-419.

23. Hadri, K. (2000) "Testing for stationarity in heterogeneous panel data" *Econometrics Journal* **3**, 148-61.

24. Henry, P.B. (2007) "Capital account liberalization: theory, evidence, and speculation" *Journal of Economic Literature* **45**, N°4, 887- 935.

25. Hermes, N and Lensink, R. (2003) "Foreign direct investment, financial development and economic growth" *Journal of Development Studies* **40**, 142-163.

26. Honig, A., (2008) "Addressing causality in the effect of capital account liberalization on growth" *Journal of Macroeconomics* **30**, 1602-1616.

27. Im, K.S., Pesaran, H. and Shin, Y. (2003) "Testing for units roots in heterogeneous panel" *Journal of Econometrics* **115**, 53-74.

28. Kaminsky,G. and Reinhart,C. (1999) "The twin crises: the causes of banking and balance of payments problems" *American Economic Review*, **89**, 473-500.

29. Kaminsky.G.L and Shmukler.S.L, (2008) "Short-run pain, Long-run gain: financial liberalization and stock market cycles" *Review of Finance*, **12**, 253-292.

30. Klein, M.W., and Olivei, G.P. (2008) "Capital account liberalization, financial depth, and economic growth" *Journal of International Money and Finance* **27**, 861-875.

31. Kuneida, T., Okada, K., and Shibata, A. (2014) "Corruption, capital account liberalization, and economic growth: Theory and evidence" *International Economics*, **139**, 80–108.

32. Law, S-H and Singh, N. (2014) "Does too much finance harm economic growth? *Journal of Banking and Finance*, **41**, pp 36-44.

33. Lee, C-C and Chang, C-P. (2009) "FDI, Financial development, and economic growth: international evidence" *Journal of Applied Economics* **12**, N°2, 249-271.

34. Levchenko, A.A, Ranciere, R. and Thoenig, M. (2009) "Growth and risk at the industry level: The real effects of financial liberalization" *Journal of Development Economics*, **89**, 210-222.

35. Levin, A., Lin, C.F., and Chu, C.S.J. (2002) "Unit Root Test in Panel Data: Asymptotic and Finite Sample Properties" *Journal of Econometrics* **108**, 1-24.

36. Moradbeigi, M and Law, S-H. (2016) "Growth volatility and resource curse: Does financial development dampen the oil shocks?" *Resources Policy* **48**, 97–103.

37. Neumann, R.M., Penl, R. and Tanku, A. (2009) "Volatility of capital flows and financial liberalization: Do specific flows respond differently?" *International Review of Economics and Finance* **18**, 488-501.

38. Pedroni, P. (1999) "Critical values for cointegration tests in heterogeneous panels with multiple regressors" *Oxford Bulletin of Economics and Statistics* **61**, 653–670.

39. Pedroni, P. (2004) "Panel cointegration: asymptotic and finite sample properties of pooled time series tests with an application to the PPP hypothesis" *Econometric Theory* **3**, 579-625.

40. Pesaran, M. H. (2004) "General diagnostic tests for cross section dependence in panels". Cambridge Working Papers in Economics No. 435.

41. Quinn, D.P. and Toyoda, A.M. (2008) "Does capital account liberalization lead to growth?" *Review of Financial Studies* **21**, N°3, 1404 -1449.
42. Rodrik, D., (1998). "Who needs capital-account convertibility? Essays in international finance" Princeton University working paper number 207, 1-16.
43. Schindler.M, Valenzuela.P and Prati. A. (2009) "Who benefits from capital account liberalization? Evidence from firm-level credit ratings data" IMF working paper number 09/210.
44. Stock, J., and Watson, M.W, (1993) "A simple estimator of cointegrating vectors in higher order integrated systems" *Econometrica* **61**, 783-820.
45. Vithessonthi, C. and Tongurai, J. (2012) "The impact of capital account liberalization measures" *International Financial Markets, Institutions and Money* **22**, 16-34.
46. Westerlund, J., and Edgerton, D.L. (2008) "A Simple Test for Co-integration in Dependent Panels with Structural Breaks" *Oxford Bulletin of Economics and Statistics* **70**, 665-704.