



Capital Account Liberalization, Institutions and Economic Growth

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Abstract

The objective of this paper is to rule on the contribution of the institutions in the explanation of the relation opening-growth. An examination of certain considerable work showed that a low institutional quality posts a deficit during the periods of liberalization. Empirically, we managed to validate this conclusion via the estimate a simultaneous equations model over the period 1983-2012 and a panel of the developed and developing countries. To secure against the risks of the process of capital account liberalization all the emerging countries must prepare adequate institutional devices before the phase of completion. In other words, an operational and favorable macroeconomic framework combined with a minimum of corruption and a strict application and severe of the law; represent the best ingredients of the success of opening policy. This is likely to increase the economic performances for the emerging countries.

Keywords: Capital Account Liberalization, Institutions, Economic Growth, Simultaneous Equations Model.

JEL Classification: F43, F33, O43

1. Introduction

The controversy on the contribution of institutions in explaining economic growth in a liberalized environment is one of the new lines of research in the economic and financial literature. Recent research, aiming to explore the recurring relationship, is very scanty. Baltagi and al. (2007) estimate a dynamic panel of four subsamples of annual data, show that trade and financial liberalization, as well as institutions is statistically significant and decisively led to variations in financial development across countries and over time since the 1980s. However, these authors show that the simultaneous opening of trade and capital account is necessary to promote financial development in a contemporary setting. Samouel (2008) examines financial systems of southern Mediterranean countries and the issue of development. The author focuses on the role of institutions and an adequate legal and institutional environment and the ability to found healthy financial development. He calculates thresholds of legal development from which financial openness may produce financial development. The econometric study of 10 countries south of the Mediterranean over the period (1980-2005), showed that financial openness in the current legal and institutional environment is detrimental.

Tahmazian and Rao (2010) try to overcome the limitations of previous studies that examined the relationship between institutional quality and growth, in terms of such quasi-econometric weaknesses of endogeneity, the heteroscedasticity and problems of omitted variables. In their study, they use a standard (Reduced-form Modeling) approach to control for country-specific effects and unobserved heterogeneity

and GMM to control endogeneity. The results of a study of a panel of 24 transition economies between 1993 and 2004 show that institutional quality and financial development have a significant impact on economic performance. Moreover, financial liberalization cannot be accomplished in a strong institutional framework.

Blackburn and Forgues - Puccio (2010) study the effect of international financial integration on economic development under corruption effect. They used a dynamic general equilibrium model of a small open economy, in which growth is driven by capital accumulation and policy is administered by bureaucrats appointed by the government. According to these authors, corruption can result due to the ability of bureaucrats to divert public funds in an environment financially liberalized. The results are: (1) It is obvious that the effect of corruption is still negative on economic development, but this effect is negative when the economy is open than when it is closed, (2) corruption may itself be affected by development and opening of the economy, (3) the positive impact of financial liberalization on growth is conditioned by a strong institutional quality and (4) corruption and poverty can coexist in a permanent fashion, rather than in a transitional economy.

Recently, Popov (2011) examines the growth and risks of production as common results of financial liberalization. The study, based on estimating a three simultaneous equations model by least squares on a sample of 55 countries, covering a period of 45 years, showed that financial liberalization has generated higher growth. The study concluded also that the risks and benefits of financial liberalization on growth are explained respectively by strong or weak institutions.

This paper integrates itself within this line of research. It aims at validating the hypothesis that capital account liberalization "produces" an economic growth, provided the economic system is provided with a reasonable level of legal and institutional development.

2. Empirical Evidence

Most theoretical studies focused on two main macroeconomic effects of capital account liberalization. The first is to strengthen the domestic financial system as unhindered movement of portfolio flows tends to increase stock market liquidity, and additionally presence of foreign banks promotes efficiency of domestic financial intermediation (Levine , 2001; Chinn and Ito , 2002 and 2006 , Eswar and al , 2003 . Battagi et al, 2009,...etc) . The second is the increasing specialization of production, resulting from international risk diversification (Kalemli - Ozcan and al, 2003, Bloch and Kan- Tang, 2003. Yucel , 2009; Sulaiman , 2010 , ..., etc.) , which allows countries to benefit from specialization by liberalizing international trade¹. This confirms the fact that capital account liberalization determines trade openness. Also, Acemoglu and al. (2004) show that financial development and trade openness are key factors of economic growth, accounting for the main transmission channels of the opening - growth relationship.

We refer to the model built by Carmignani (2008), which best reflects theoretical conditions, suggesting that financial development and trade openness are two transmission channels through which capital account liberalization affects growth. The model is given by:

¹ Such a mechanism has been theoretically proposed by Obstfeld (1994), Acemoglu and Zilibotti (1997), and Feeney (1999).

$$\begin{cases} y_{1it} = \alpha_0 + \alpha_1 y_{2it} + \alpha_2 y_{3it} + \omega_1 CAL_{it} + \delta_1 M_{it} + \varepsilon_{it} & (1) \\ y_{2it} = \beta_0 + \beta_1 y_{1it} + \beta_2 y_{3it} + \omega_2 CAL_{it} + \delta_2 \Gamma_{it} + v_{it} & (2) \\ y_{3it} = \gamma_0 + \gamma_1 y_{1it} + \gamma_2 y_{2it} + \omega_3 CAL_{it} + \delta_3 K_{it} + \zeta_{it} & (3) \end{cases}$$

where y_1 is the growth rate of GDP per capita, y_2 and y_3 , respectively, are two indicators: of financial development, measured by the volume of loans to the private sector as a percentage of GDP and trade openness, measured by the sum of imports and exports (% of GDP), M , Γ and K represent a set of control variables that may have some common elements, ε , v and ζ are terms of stochastic errors, CAL is indicator of capital account liberalization, of which we hold a "Lib" indicator, based on the Share indicator of Klein and Olivei (1999) and (2000), founded and built as part of this study. The study covers a period of 30 years stretching from 1983 to 2012 and examines 80 developed and developing countries. The choice of this period is justified by the fact that most countries have started their financial reforms, mainly, financial liberalization followed by capital account liberalization.

In order to promote the debate on the issue of the importance of institutional framework in explaining the relationship between capital account liberalization and economic growth, we will integrate four institutional variables combined with the variable CAL of capital account liberalization. The model to estimate becomes:

$$\begin{cases} y_{1it} = \alpha_0 + \alpha_1 y_{2it} + \alpha_2 y_{3it} + \omega_1 (CAL_{it} * INST_{it}) + \delta_1 M_{it} + \varepsilon_{it} & (4) \\ y_{2it} = \beta_0 + \beta_1 y_{1it} + \beta_2 y_{3it} + \omega_2 (CAL_{it} * INST_{it}) + \delta_2 \Gamma_{it} + v_{it} & (5) \\ y_{3it} = \gamma_0 + \gamma_1 y_{1it} + \gamma_2 y_{2it} + \omega_3 (CAL_{it} * INST_{it}) + \delta_3 K_{it} + \zeta_{it} & (6) \end{cases}$$

Given that the proposed model is panel data, we refer to Errors Composite Double Least Squares (EC2SLS) built by Baltagi [2005]. A second reading of the three equations of our model shows that equation (4) is a growth model. Indeed, in light of the work of Eichengreen and Leblang, (2008) Honig (2008), Eichengreen and al. (2011), ..., etc., such an equation better captures the dynamic specification, as growth rate is correlated with the lag among explanatory variables. Thus, we use the GMM system method which is the most efficient method of estimating dynamic equations:

3. Estimation and interpretation of results

Our overall model is the following:

$$Y = \varphi \tilde{Y} + \omega(CAL * INST) + \delta X + \varepsilon$$

The chosen four different indices for Institutions: Corruption (CORRUP), Law (LAW), Ethnic tensions (ETHNIC) and Bureaucracy (Bureaucracy) are already defined and presented above, respectively, in models (I), (II), (III) and (IV). The four models estimated are:

$$Y_{[country\ i.\ year\ t]} = \varphi \tilde{Y}_{i,t} + \omega(CAL_{i,t} * CORRUP_{i,t}) + \delta X_{i,t} + \varepsilon_{i,t} \quad \text{(I)}$$

$$Y_{[country\ i.\ year\ t]} = \varphi \tilde{Y}_{i,t} + \omega(CAL_{i,t} * LAW_{i,t}) + \delta X_{i,t} + \varepsilon_{i,t} \quad \text{(II)}$$

$$Y_{[country\ i.\ year\ t]} = \varphi \tilde{Y}_{i,t} + \omega(CAL_{i,t} * ETHNIC_{i,t}) + \delta X_{i,t} + \varepsilon_{i,t} \quad \text{(III)}$$

$$Y_{[country\ i.\ year\ t]} = \varphi \tilde{Y}_{i,t} + \omega(CAL_{i,t} * BUREAUCRACY_{i,t}) + \delta X_{i,t} + \varepsilon_{i,t} \quad \text{(IV)}$$

The first equation of each model is estimated by a GMM system. The other two equations are estimated by Baltagi EC2SLS².

The results in Table (3) from the first equation of the simultaneous equations model (I, II, III and V) by the GMM system does not reject the hypothesis of the validity of lagged variables in level and in differences as instruments (p-value of the Sargan test is much higher than 5%) and the assumption of no order 2 autocorrelation (p- value of Arellano and Bond test for AR (2) is greater than 5%). In addition, we find that the estimator coefficient of the lagged endogenous variable (growth) remains significant at the 1% level for all regressions, which leads us to firmly conclude that equation (4) best captures the specification dynamics. In addition, the GMM system method is a good specification of instruments without problems of heteroscedasticity or auto- correlations.

Moreover, equations (5) and (6), which represent the second and third equation of our simultaneous model, are estimated by EC2SLS method to account for endogenous variables among the explanatory variables for each equation. We note that the feedback effect of growth on financial development is significant but not for trade liberalization ($\gamma_1 = 0$ can be a valid restriction in the model). Specifically, a faster growth increases financial development, while the effect of trade openness is unimportant.

The estimated coefficient of corruption combined with capital account liberalization leads to a negative value that is statistically significant for equations (5) and (6) ($\omega_2 = 3.712$ and $\omega_3 = - 0.090$, respectively). In addition, the estimated coefficients α_1, α_2 , which reflects the impact of FINDEV and OPEN on growth are negative and statistically different of zero. This latter result indicates that financial development and trade openness, representing the main transmission channels of the relationship between capita account liberalization and economic growth, do not cause a strong and rapid growth in a liberalized environment where corruption is high. In this vein, Klapper and Love (2004) showed that a country that does not have an effective legal framework and which is at a high level of corruption cannot lead a good economic performance.

As for the interaction variable, law and capital account liberalization ($CAL * LAW$), the estimation is negative and significant at the 5% level for the regressions for the $KAOPEN$ of Capital account liberalization indicator for equations (5) and (6) ($\omega_2 = 1724$ and $\omega_3 = -0.244$, respectively). The estimated coefficients α_1, α_2 of FINDEV and OPEN in the growth equation yield significant negative values (-0.001 and -0.052 , respectively), which shows that a decrease in the law index in an economy that opts for a financial sector development and trade openness, two steps that precede capital account liberalization, does not accelerate economic growth. Indeed, weakness of rule of law increases the likelihood of the emergence of banking crises and results therefore in slow economic growth. This result is consistent with Demirgüç -Kunt et al. (2010) who indicated that poor law enforcement weakens financial systems and increases the risk arising from capital account liberalization.

Regarding the models (III) and (V), we used the two institutional variables ($ETHNIC$) and ($BUREAUCRATY$) combined with the variable (CAL). We found negative and significant coefficients for equation (5) ($\omega_2 = -0.968$ and -1.118 for regressions of the Lib indicator of CAL) and not significant for equation (6). Moreover, estimation of α_1 gives a significant value of -0.016 for the two models. These results indicate that a country with racial discrimination and a low level of bureaucracy cannot achieve good performance if it decides to develop its financial system even in a phase of capital account liberalization. This stands as an obstacle to the achievement of efficient economic growth. In this context,

² The choice of this method is because it simultaneously takes into account Within and Between transformations of 2SLS.

David (2005) points out that the elimination of discrimination of any kind is necessary to excessive economic growth in a country.

After interpreting the results of the estimation of our simultaneous equations model of the total sample of 80 developed and developing countries using the regression of the *KAOPEN* and *Lib* indicators of, we note that the sample is characterized by a heterogeneous panel. In other words, it does not take into account the specificity of the country and its financial, economic and institutional characteristics. It will be interesting to examine empirically whether the transmission channels linking capital account liberalization, combined with institutions and growth differ between countries. This brings us to proceed like Brandolini and Smeeding (2008), Fung (2009), Demirgüç -Kunt (2010), Dabla - Norris (2010) , ..., etc. , by dividing our sample. In this context, we use the latest classification of countries by income group published by the World Bank in 2010. Thus, countries are classified into four categories: High income, Low income, Lower Middle income and Upper middle income (Table (7)). The results of estimating the five models presented above by group of countries is presented in Tables (2), (3), (4) and (5). We adopt the same approach to estimate the four sample groups. The results of the five models (I, II, III and V) for each distribution indicate that:

First, the estimation of the first equation of the model, the GMM system, indicates that null hypothesis on the validity of instruments and over-identification of the equation can not be rejected (p-value of Sargan test is much higher than 5%) and the assumption of no order 2 autocorrelation (p- value of Arellano and Bond test for AR (2) is greater than 5% for most regressions) . Second, the estimation of the second and third simultaneous equation models indicates that these equations are, in general, overall significant (probability of Wald test is significantly lower than 5%). It shows also that the effect of feedback from growth on financial development is significant for the first three groups of countries (High income, Upper middle income and Lower middle income), while the effect of trade opening is unimportant ($\gamma_1 = 0$). Moreover, the non-significance of the coefficients β_1 and γ_1 for the regressions on the subsample countries with low income shows that the combined effect of feedback on growth and *FINDEV* and *OPEN* is limited to zero ($\beta_1 = \gamma_1 = 0$) .

Tables (2) and (3) show that for first and second category countries, corruption was not significant in the process of capital account liberalization. Indeed, the estimated coefficients of the interaction variables *KAOPEN * CORRUP* and *Lib* CORRUP* are generally not significant in the three equations of model (I). In other words, for developed countries³ , with less corruption, financial development and trade openness affect, positively, economic growth and its presence helps to reduce the benefits of adopting a policy of capital account liberalization (α_1 and α_2 reflecting the impact of *FINDEV* and *OPEN* on growth, respectively, are positive and statistically significant). Moreover, the results in Tables (4) and (5) show that the variable capital account liberalization combined with corruption *CAL*CORRUP* leads to a negative and statistically significant value for the second and the third equation of model (I) . In addition, α_1 coefficient is negative and significant for Lower middle income countries and not significant for Low income countries, while α_2 coefficient is negative and significant for two categories of countries characterized by low and middle income countries. These results indicate that in underdeveloped countries⁴ , capital account liberalization was initiated in a corrupt environment, which is an obstacle to achieve a strong and steady economic growth. This was confirmed by Du (2008) who concludes that corruption leads to lower investment volume, which results in a decrease in economic growth.

³ The first and second categories of countries include most developed countries and some wealthy Gulf countries.

⁴ The third and fourth categories of countries consist of most underdeveloped countries.

As for the estimation of model (II) , the interaction variable capital account liberalization, law index ($CAL * LAW$) scores a positive and significant coefficient in *FINDEV* and *OPEN* equations for regressions of high income countries and negative for low and middle income countries with significant coefficients of α_1 and α_1 in the growth equation. The sign of these coefficients reveals that capital account liberalization in the presence of respect for law enhances financial development and strengthening of trade openness, which contributes, therefore, to accelerating growth of developed countries. This result is confirmed by Hasan et al. (2009) who advocate that rule of law by nature reduces corruption and increases economic growth, while emerging and underdeveloped countries, characterized by a lower law index, fail to take advantage of capital account liberalization influenced by weak financial development and trade liberalization failure.

The two institutional variables (*ETHNIC*) and (*BUREAUCRACY*) combined with the variable (*CAL*) score positive and significant coefficients in *FINDEV* and *OPEN* equations for the first , second and third sub-sample and negative and significant for low income countries. In addition, α_1 and α_2 are mostly significant. Indeed, high and medium-high income countries extended capital account liberalization, by eliminating racial discrimination and improving bureaucracy level, which yielded good results in terms of financial development and trade openness and led to the creation of stronger economic growth. However, low-income countries, characterized by low level of bureaucracy and an environment that encourages discrimination, failed to take advantage of financial development and trade openness. Therefore, the adoption of capital account liberalization was not profitable as economic growth has remained low and modest.

4. Concluding remarks

Through this study, we tried to shed light on the contribution of the theory of institutions in explaining the causal link between the process of capital account liberalization and growth and thus provide the answers to the mixed effect of capital account liberalization. To this end, we estimated a three simultaneous equations model using EC2SLS and GMM system on a panel of developed and developing countries divided into four categories according to their income level during the period from 1983 to 2012. The obtained results show:

Institutional quality has played a very important role in explaining the causal link between capital account liberalization and economic growth. Opening is a process that requires the establishment of appropriate institutional environment before the completion phase. More specifically, emerging countries seeking to accelerate their economic growth should necessarily have a highly developed institutional, legal and judicial framework to promote capital account liberalization and take advantage of its benefits.

Technically, the Errors composites Double Least Squares method applied to each equation seems consistent in producing performance estimation. We applied the GMM system to the first of our simultaneous equation model which exhibits dynamic elements. The other two equations are estimated by EC2SLS of Baltagi. Moreover, it should be noted that this method has some limitations as it does not take into account intra- equations relationship, because of correlation between riskiness of each equation. In this case EC2SLS method is found limited. To correct this limitation, Baltagi (2005 and 2007) developed a complete information technique called 3SLS applied to the entire system. It assumes that the variance - covariance matrix of the residuals of the three equations can be non-diagonal⁵. In addition, we

⁵ If residuals of equations matrix is diagonal, 3SLS are asymptotically equivalent to EC2SLS. In this case, estimation of the system is not useful than equation-by-equation estimation (see Baltagi, 2007)

recommend that it is important to use other "De facto" indicators in addition to two "De jure" indices of *Lib* and *KAOPEN* to measure capital account liberalization.

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APPENDIX

Table 1: Capital Account Liberalization, Institutions Quality and Economic Growth
(Full sample)

	(I)		(II)		(III)		(V)	
	(I.1)	(I.2)	(II.1)	(II.2)	(III.1)	(III.2)	(IV.1)	(IV.2)
Equation 1 : Dependant variable Growth								
GROWTH (-1)	0.145***	0.208***	0.150***	0.211***	0.151***	0.210***	0.151***	0.211*
FINDEV	-0.001**	-0.017**	-0.001**	-0.016**	-0.001**	-0.016**	-0.001*	-0.016*
OPEN	-0.048**	-0.095**	-0.051**	-0.097**	-0.051**	-0.097**	-0.049**	-0.097
KAOPEN*CORRUP	-0.255**							
Lib*CORRUP		0.248**						
KAOPEN*LAW			-0.191**					
Lib*LAW				0.095				
KAOPEN*ETHNIC					-0.144**			
Lib*ETHNIC						0.123		
KAOPEN*BUREAUC							-0.240**	
Lib*BUREAUCRACY								0.167
SCHOOL	0.149	0.156	0.044	0.158	0.021	0.163	-0.022	0.156
POP GROWTH	-0.654**	-0.591**	-0.657**	-0.596**	-0.669**	-0.577**	-0.660**	-0.594
GOV.EXPENDITURE	-0.358	-0.325	-0.362	-0.332	-0.369	-0.330	-0.369	-0.331
Sargan Test	66.894	42.2395	66.7304	43.0731	67.7200	44.0019	66.38849	.
p-value	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.
Test of AR(2)	0.1139	0.1168	0.7761	0.5712	0.6241	0.5513	.	0.6238
p-value	0.9093	0.9070	0.4367	0.5678	0.5325	0.5814	.	0.5328
Equation 2 : Dependant variable FINDEV								
GROWTH	-1.057	-0.595**	-0.904	-0.582**	-0.950	-0.481**	-0.903	-0.456
OPEN	0.540	-0.297**	0.510	-0.308**	0.502	-0.329**	0.526	-0.271
KAOPEN*CORRUP	-3.712*							
Lib*CORRUP		-0.460						
KAOPEN*LAW			-1.724*					
Lib*LAW				0.458				
KAOPEN*ETHNIC					-1.594			
Lib*ETHNIC						-0.968**		
KAOPEN*BUREAUC							-3.135	
Lib*BUREAUCRACY								-1.118*
GDP	0.001	0.009**	0.001	0.009**	0.001	0.009**	0.001	0.008*
INFLATION	0.005	0.012***	0.005	0.012***	0.005	0.012***	0.005	0.012*
DEBT	-0.005	0.007	-0.062	0.039	-0.064	0.095	-0.079	0.014
Equation 3 : Dependant variable OPEN								
GROWTH	-0.110**	0.180***	-0.110**	0.179***	-0.109**	0.177***	-0.103**	0.221*
FINDEV	0.001	-0.053**	0.001	-0.049**	0.001	-0.049**	0.001	-0.050
KAOPEN*CORRUP	-0.090*							
Lib*CORRUP		-0.191**						
KAOPEN*LAW			-0.244**					
Lib*LAW				0.010				
KAOPEN*ETHNIC					-0.154			
Lib*ETHNIC						0.015		
KAOPEN*BUREAUC							-0.569	
Lib*BUREAUCRACY								-0.275
GDP	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***	0.001
Nbr of observations	1574	1574	1574	1574	1574	1574	1574	1574

*, ** and *** indicate statistical significance at the 10% and 5% levels respectively; (I.1), (II.1), (III.1) and (IV.1) regressions of KAOPEN for CAL; (I.2), (II.2), (III.2) and (IV.2) regressions of Lib of CAL. The equation estimated by GMM in system while equations 4 and 5 are estimated by Baltagi's EC2SLS. The variables Surfarea and Poptot have been omitted from equation 6.

Table 2: High Income

	(I)		(III)		(IV)		(V)	
	(I.1)	(I.2)	(III.1)	(III.2)	(IV.1)	(IV.2)	(V.1)	(V.2)
Equation 2 : Dependant variable Growth								
GROWTH (-1)	0.186***	0.260***	0.188***	0.260***	0.190***	0.260***	0.191***	0.258
FINDEV	0.020**	0.014**	0.016**	0.014**	0.017**	0.014**	0.016**	-0.015
OPEN	0.053**	0.007	0.057**	0.005	0.059**	0.004	0.044**	0.004
KAOPEN*CORRUP	-0.129							
Lib*CORRUP		0.021						
KAOPEN*LAW			-0.191**					
Lib*LAW				0.095				
KAOPEN*ETHNIC					-0.144**			
Lib*ETHNIC						0.123		
KAOPEN*BUREAUC							-0.240**	
Lib*BUREAUCRACY								0.167
SCHOOL	0.086	0.376	-0.007	0.416	-0.020	0.404	-0.015	0.365
POP GROWTH	-0.340**	-0.460**	-0.657**	-0.596**	-0.669**	-0.577**	-0.660**	-0.594
GOV.EXPENDITURE	-0.445**	-0.461	-0.348**	-0.457**	-0.371**	-0.467**	-0.315**	-0.473
Sargan Test	61.76	65.82	83.83	85.85	68.62	65.14	56.33	53.88
p-value	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Test of AR(2)	-2.04	-1.74	-2.39	-2.41	-2.00	-1.55	-1.18	-1.08
p-value	0.410	0.810	0.170	0.160	0.460	0.122	0.237	0.279
Equation 2 : Dependant variable FINDEV								
GROWTH	0.567*	0.679**	0.631**	0.537**	-0.692**	-0.642**	-0.410**	-0.436
OPEN	-0.212		-0.151	-0.856	-0.108	-0.670**	-0.149	-0.284
KAOPEN*CORRUP	-1.629							
Lib*CORRUP		-0.024						
KAOPEN*LAW			1.025*					
Lib*LAW				0.054**				
KAOPEN*ETHNIC					1.800**			
Lib*ETHNIC						0.790**		
KAOPEN*BUREAUC							1.447**	
Lib*BUREAUCRACY								0.790*
GDP	0.001	0.000	0.006***	0.000	0.006***	-0.002	0.002	-0.002
INFLATION	0.205	-0.142	0.491**	-0.153	0.481***	-0.077	0.136	-0.077
DEBT	0.386	0.001	0.604	0.020	0.969***	0.143	0.524*	0.143
Equation 3 : Dependant variable OPEN								
GROWTH	0.119	0.180	0.121	0.179	0.122	0.177	0.148	0.221
FINDEV	-0.067	-0.053**	-0.062**	-0.049**	-0.061**	-0.049**	-0.059**	-0.050
KAOPEN*CORRUP	-0.434							
Lib*CORRUP		-0.191**						
KAOPEN*LAW			0.027*					
Lib*LAW				0.010*				
KAOPEN*ETHNIC					-0.189*			
Lib*ETHNIC						0.015		
KAOPEN*BUREAUC							0.464**	
Lib*BUREAUCRACY								0.275*
GDP	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***	0.001
Nbr of observations	620	620	620	620	620	620	620	620

*, ** and *** indicate statistical significance at the 10% and 5% levels respectively; (I.1), (II.1), (III.1) and (IV.1) regressions of KAOPEN for CAL; (I.2), (II.2), (III.2) and (IV.2) regressions of Lib of CAL. The equation estimated by GMM in system while equations 4 and 5 are estimated by Baltagi's EC2SLS. The variables Surfarea and Poptot have been omitted from equation 6.

Table 3: Upper Middle Income

	(I)		(III)		(IV)		(V)	
	(I.1)	(I.2)	(III.1)	(III.1)	(IV.1)	(IV.2)	(V.1)	(V.2)
Equation 1 : Dependant variable Growth								
GROWTH (-1)	0.220***	0.224**	0.217***	0.223**	0.221***	0.223**	0.214***	0.215*
FINDEV	0.010**	0.011	0.008**	0.010*	0.011*	0.011	0.008*	-0.008
OPEN	0.082**	0.069**	0.093**	0.071**	0.087	0.070**	0.096**	-0.082
KAOPEN*CORRUP	-0.196							
Lib*CORRUP		-0.015						
KAOPEN*LAW			-0.247**					
Lib*LAW				-0.083				
KAOPEN*ETHNIC					-0.139**			
Lib*ETHNIC						-0.057		
KAOPEN*BUREAUC							-0.389**	
Lib*BUREAUCRACY								-0.283
SCHOOL	-0.407	-0.695*	-0.353	-0.645*	-0.328	-0.613	-0.560	-0.796
POP GROWTH	-1.008**	-0.942**	-1.025**	-0.961**	-0.955**	-0.951**	-1.066**	-1.060
GOV.EXPENDITURE	-0.263	-0.225	-0.268	-0.236	-0.255	-0.233	-0.287	-0.272
Sargan Test	63.26	38.52	62.95	38.13	63.26	38.37	63.87	38.43
p-value	0.349	0.403	0.341	0.376	0.352	0.364	0.331	0.347
Test of AR(2)	-0.25	-0.87	-0.24	-0.96	-0.25	-0.83	-0.26	-0.83
p-value	0.804	0.383	0.812	0.335	0.804	0.406	0.793	0.408
Equation 2 : Dependant variable FINDEV								
GROWTH	0.695**	0.520**	0.560**	0.477**	0.646**	0.481**	0.627**	0.456
OPEN	-0.310**	-0.255*	-0.360**	-0.279	-0.389**	-0.346**	-0.268*	-0.188
KAOPEN*CORRUP	-0.849							
Lib*CORRUP		-1.884						
KAOPEN*LAW			-3.742**					
Lib*LAW				-3.230**				
KAOPEN*ETHNIC					1.757**			
Lib*ETHNIC						2.188**		
KAOPEN*BUREAUC							3.060***	
Lib*BUREAUCRACY								3.457
GDP	0.008***	0.007***	0.007***	0.007***	0.007***	0.007**	0.006***	0.005*
INFLATION	0.011***	0.012***	0.010***	0.011***	0.011***	0.012***	0.010***	0.011*
DEBT	0.056	0.145	0.112	0.199	0.151	0.296	0.057	0.152
Equation 3 : Dependant variable OPEN								
GROWTH	0.227	-0.170	-0.243	-0.168	-0.237	-0.162	-0.240	-0.167
FINDEV	-0.043**	-0.011	-0.041**	-0.010	-0.041**	-0.010	-0.029*	-0.001
KAOPEN*CORRUP	-0.717**							
Lib*CORRUP		0.292						
KAOPEN*LAW			-0.019**					
Lib*LAW				-0.107**				
KAOPEN*ETHNIC					0.163			
Lib*ETHNIC						0.182		
KAOPEN*BUREAUC							0.773**	
Lib*BUREAUCRACY								0.801*
GDP	0.001*	.0.000	0.001	0.000	0.001*	0.000	0.001*	0.000
Nbr of observations	411	411	411	411	411	411	411	411

*, ** and *** indicate statistical significance at the 10% and 5% levels respectively; (I.1), (II.1), (III.1) and (IV.1) regressions of KAOPEN for CAL; (I.2), (II.2), (III.2) and (IV.2) regressions of Lib of CAL. The equation estimated by GMM in system while equations 4 and 5 are estimated by Baltagi's EC2SLS. The variables Surfarea and Poptot have been omitted from equation 6.

Table 4: Lower Middle Income

	(I)		(III)		(IV)		(V)	
	(I.1)	(I.2)	(III.1)	(III.2)	(IV.1)	(IV.2)	(V.1)	(V.2)
Equation 1 : Dependant variable Growth								
GROWTH (-1)	0.048**	0.015**	0.067*	0.030**	0.062*	0.024**	0.04**	-0.007
FINDEV	-0.014*	-0.011*	-0.008*	-0.007*	-0.011*	-0.009*	-0.009*	-0.010
OPEN	-0.120**	-0.188**	-0.106**	-0.185**	-0.122**	-0.202**	-0.136**	-0.223
KAOPEN*CORRUP	-0.385**							
Lib*CORRUP		-0.323**						
KAOPEN*LAW			-0.164**					
Lib*LAW				-0.202**				
KAOPEN*ETHNIC					-0.209**			
Lib*ETHNIC						-0.224**		
KAOPEN*BUREAUC							-0.497**	
Lib*BUREAUCRACY								-0.630
SCHOOL	-0.083	-0.062	-0.278	-0.098	-0.270	-0.155	-0.099	0.090
POP GROWTH	-0.645**	-0.940**	-0.723**	-0.945**	-0.770**	-0.982**	-0.764**	-0.951
GOV.EXPENDITURE	-0.476	-0.319**	-0.468	-0.328**	-0.489	-0.358**	-0.492	-0.374
Sargan Test	40.91	37.68	41.65	32.10	42.91	28.67	42.03	28.82
p-value	0.170	0.370	0.140	0.124	0.100	0.233	0.130	0.227
Test of AR(2)	1.11	-2.10	1.25	-1.86	0.85	-2.36	1.17	-2.36
p-value	0.268	0.036	0.213	0.560	0.394	0.180	0.241	0.110
Equation 2 : Dependant variable FINDEV								
GROWTH	0.583**	0.958**	0.572**	0.939**	0.578**	0.962**	0.612**	1.017
OPEN	-0.037	-0.140	-0.047	-0.141	-0.042	-0.143	-0.079	-0.235
KAOPEN*CORRUP	-0.764*							
Lib*CORRUP		-0.988*						
KAOPEN*LAW			-0.179**					
Lib*LAW				-0.416**				
KAOPEN*ETHNIC					-0.118			
Lib*ETHNIC						-0.355		
KAOPEN*BUREAUC							0.736**	
Lib*BUREAUCRACY								1.640
GDP	0.026***	0.027***	0.026***	0.026***	0.026***	0.026***	0.027***	0.027*
INFLATION	-0.062*	-0.210**	-0.066**	-0.198**	-0.067**	-0.208**	-0.068**	-0.218
DEBT	-0.250	-0.410	-0.261	-0.461	-0.271	-0.491	-0.254	-0.401
Equation 3 : Dependant variable OPEN								
GROWTH	-0.087	-0.478	-0.076	-0.468	-0.083	-0.468	-0.117	-0.497
FINDEV	-0.022	-0.048**	-0.019	-0.046**	-0.020	-0.044*	-0.023	-0.059
KAOPEN*CORRUP	-0.063**							
Lib*CORRUP		-0.222**						
KAOPEN*LAW			-0.358**					
Lib*LAW				-0.124**				
KAOPEN*ETHNIC					-0.161			
Lib*ETHNIC						-0.181**		
KAOPEN*BUREAUC							1.088**	
Lib*BUREAUCRACY								1.245*
GDP	0.000	0.001	0.000	0.001	0.000	0.001	0.002	0.003*
Nbr of observations	325	325	325	325	325	325	325	325

*, ** and *** indicate statistical significance at the 10% and 5% levels respectively; (I.1), (II.1), (III.1) and (IV.1) regressions of KAOPEN for CAL; (I.2), (II.2), (III.2) and (IV.2) regressions of Lib of CAL. The equation estimated by GMM in system while equations 4 and 5 are estimated by Baltagi's EC2SLS. The variables Surfarea and Poptot have been omitted from equation 6.

Table 5 : Low Income

	(I)		(III)		(IV)		(V)	
	(I.1)	(I.2)	(III.1)	(III.2)	(IV.1)	(IV.2)	(V.1)	(V.2)
Equation 1 : Dependant variable Growth								
GROWTH (-1)	0.026	0.068	0.034	0.055	0.035	0.082	0.038	0.087
FINDEV	0.000	0.020	0.000	0.053	0.000	0.031	0.000	0.038
OPEN	-0.053**	-0.126*	-0.053**	-0.123*	-0.055**	-0.150**	-0.054**	-0.132
KAOPEN*CORRUP	-0.265**							
Lib*CORRUP		-0.296						
KAOPEN*LAW			-0.111					
Lib*LAW				-0.361*				
KAOPEN*ETHNIC					-0.076			
Lib*ETHNIC						-0.151		
KAOPEN*BUREAUC							-0.087	
Lib*BUREAUCRACY								0.140
SCHOOL	-0.497	0.490	-0.472	0.601	-0.488	0.716	-0.459	1.014
POP GROWTH	0.075	1.404**	0.155	2.075***	0.088	2.015**	0.055	1.878
GOV.EXPENDITURE	-0.292	-0.358	-0.306	-0.353	-0.303	-0.368	-0.313	-0.365
Sargan Test	25.03	24.02	25.19	24.51	24.97	24.74	25.38	25.07
p-value	0.349	0.403	0.341	0.376	0.352	0.364	0.331	0.347
Test of AR(2)	0.410	0.190	-0.40	0.180	0.410	0.170	0.400	0.170
p-value	0.681	0.850	0.689	0.855	0.683	0.864	0.392	0.863
Equation 2 : Dependant variable FINDEV								
GROWTH	-3.029	0.334	-2.368	0.213	-2.647	0.203	-1.796	0.203
OPEN	2.620	-0.409**	2.395	-0.310	2.117	-0.424**	2.551	-0.424
KAOPEN*CORRUP	-13.979*							
Lib*CORRUP		1.489***						
KAOPEN*LAW			-7.748					
Lib*LAW				-1.371*				
KAOPEN*ETHNIC					-5.304			
Lib*ETHNIC						-1.203		
KAOPEN*BUREAUC							-19.03*	
Lib*BUREAUCRACY								-1.03*
GDP	-0.525**	0.073***	-0.510**	0.057***	-0.477**	0.061***	-0.554**	0.061*
INFLATION	-0.324	0.008	0.253	0.020	0.258	0.009	0.175	0.009
DEBT	1.425	-0.669**	0.995	-1.566	0.806	-1.465**	0.917	-1.465
Equation 3 : Dependant variable OPEN								
GROWTH	-0.425	-0.336	-0.440	-0.337	-0.428	-0.323	-0.476	-0.115
FINDEV	0.003	-0.531**	0.003	-0.537**	0.003	-0.557**	0.003	-0.571
KAOPEN*CORRUP	-0.284**							
Lib*CORRUP		-0.150**						
KAOPEN*LAW			-0.275*					
Lib*LAW				-0.177**				
KAOPEN*ETHNIC					-0.086			
Lib*ETHNIC						-0.208**		
KAOPEN*BUREAUC							0.805	
Lib*BUREAUCRACY								-0.97*
GDP	0.054***	0.036***	0.054***	0.038***	0.052***	0.036***	0.057***	0.007
Nbr of observations	243	243	243	243	243	243	243	243

*, ** and *** indicate statistical significance at the 10% and 5% levels respectively; (I.1), (II.1), (III.1) and (IV.1) regressions of KAOPEN for CAL; (I.2), (II.2), (III.2) and (IV.2) regressions of Lib of CAL. The equation estimated by GMM in system while equations 4 and 5 are estimated by Baltagi's EC2SLS. The variables Surfarea and Poptot have been omitted from equation 6.

Table 6: Definition and sources of variables

Variables	Definition	Source
<i>Variables of the model</i>		
Growth	Growth rate of GDP per capita	WDI
FINDEV	Volume of domestic credits of private sector in % of GDP	WDI
OPEN	Sum of imports and exports (in % of GDP) : $[(M + X)/PIB]$	WDI
CAL	<i>KAOPEN</i> : First standardized principal component of <i>R1</i> , <i>R2</i> , <i>SHARE3</i> and <i>R4</i> , where: (i) <i>R1</i> takes value 1 in the absence of multiple exchange rates, (ii) <i>R2</i> takes value 1 if current account transactions are not restricted, (iii) <i>R3</i> takes value 1 if capital account transactions are not restricted, (iv) <i>R4</i> takes value 1 in the absence of a requirement to surrender export proceeds. <i>SHARE4</i> is then constructed in each year as the average of <i>R3</i> in that year and in the four preceding years. <i>Lib</i> : our index is considered as a dummy variable that takes 0 if the country imposes restrictions on its capital account, if the country started to open its capital account during the study period, « <i>Lib</i> » is equal to the number of years where control is upheld and approximated to the number of years of the studied period (30 years for our study), if the economy proceeds to total liberalization of its capital account « <i>Lib</i> » takes 1.	Chinn and Eto [2007] <i>Annual Report of Exchange Arrangements and Exchanges Restrictions of FMI</i>
GDP	Logarithm of real GDP per capita	WDI
School	School life expectancy (primary to tertiary education):	CIA World Factbook
Total Population	Logarithm of total population	WDI
Population Growth	Population annual growth rate	WDI
Government expenditure	Public expenditure (in % of GDP)	WDI
Inflation	Log(100+annual variation of consumption price index)	WDI
Government debt	Public debt (in % of GDP)	WDI
Surfarea	Log of country's total surface	WDI
<i>Instrumental Variables</i>		
Autocracy	Autocracy index	Polity IV
Democracy	Democracy index	Polity IV
Policy	Difference between democracy and autocracy	Polity IV
Catholic	Catholic population (in % of total population)	CWF
Muslim	Muslim Population (in % of total population)	CWF
System	Type of political regime: takes 1 (presidential republic), 2 (monarchy), 3 (parliamentary republic) and 4 (others)	CWF

Détails de sources de données :

WDI: World Development Indicator 2010, The World Bank, Washington D.C. web-site: <http://data.worldbank.org>

Chinn and Ito [2007] « A New Measure of Financial Openness » http://ca-bi.com/data/chinitto_2.pdf

Polity IV: Monty G., M. Narshall & K. Jagers "Political Regime Characteristics and Transitions, 1800-2003": <http://www.cidcm.umd.edu/inscr/polity>

CWF: CIA World Fact Book: <https://www.cia.gov/library/publications/the-world-factbook/index.html>

Annual Report of Exchange Arrangements and Exchanges Restrictions of IMF : the appropriate information is at the level of line E2 of table « Exchange Arrangements and Exchange Restrictions » ; E2 : Restrictions on payments for capital transaction. The table shows that « *Lib* » takes into account time dimension, for instance all countries ($Lib_{81} = 0$; $Lib_{82} = 0.033$; $Lib_{83} = 0.066$; ...etc.) which opened their capital markets in 1981. Countries ($Lib_{81} = 0$; $Lib_{82} = 0$; $Lib_{83} = 0.033$; $Lib_{83} = 0.066$; ...etc.) which opened their capital markets in 1982, and so on.

Institutional variables

Corruption	Corruption is a behavior punishable by law by which a person (the corrupt) asks, agrees or accepts a donation, an offer or a promise, gifts or any advances in view of accomplishing, reporting or omitting to accomplish an action directly or indirectly within his/her functions. This index varies between 0 (high level) and 10 (low level).	<i>International Country Risk guide (ICRG)*</i>
Law and order	Law index is an index of measuring respect of law in a country. It varies between 0 and 10. The higher it is means law is respected.	<i>International Country Risk guide (ICRG)*</i>
Ethnic Tensions	This component is an evaluation of the degree of discrimination in a country based on race, nationality or language. Lower estimates are given to countries where racial and nationality tensions are high because opposing groups are intolerant and less ready to compromise. Higher estimates are given to countries where tensions are minimal, although such differences may still exist.	<i>International Country Risk guide (ICRG)*</i>
Bureaucracy Quality	Institutional authority and quality of bureaucracy is another factor that reduces to the minimum political reforms when governments change. Consequently, scores are given to countries where bureaucracy has the power and expertise to manage without radical political changes or interruptions of government services. In these low-risk countries, bureaucracy seems to be synonymous to political repression and be a mechanism established for recruitment and training. Countries with less bureaucracy effect receive lower scores because a change in government produces day to day political formulations and administrative functions.	<i>International Country Risk guide (ICRG)*</i>

**International Country Risk guide (ICRG), site web: <http://www.prsgroup.com/ICRG.aspx>*

Table 7: Sample of countries ranked by the World Bank...

Country	Category	Country	Category
Albania	Upper middle income	Kenya	Low income
Algeria	Upper middle income	Korea, Rep.	High income: OECD
Argentina	Upper middle income	Kuwait	High income: nonOECD
Australia	High income: OECD	Latvia	High income: nonOECD
Bahrain	High income: OECD	Liberia	Low income
Bangladesh	Low income	Libya	Upper middle income
Barbados	High income: OECD	Malaysia	Upper middle income
Belgium	High income: OECD	Mali	Low income
Brazil	Upper middle income	Malta	High income: nonOECD
Bulgaria	Upper middle income	Mauritania	Low income
Canada	High income: OECD	Mexico	Upper middle income
Chile	Upper middle income	Mongolia	Lower middle income
China	Lower middle income	Morocco	Lower middle income
Colombia	Upper middle income	Mozambique	Low income
Costa Rica	Upper middle income	Namibia	Upper middle income
Denmark	High income: OECD	Netherlands	High income: OECD
Dominica	Upper middle income	New Zealand	High income: OECD
Ecuador	Lower middle income	Norway	High income: OECD
Egypt, Arab Re	Lower middle income	Oman	High income: nonOECD
El Salvador	Lower middle income	Panama	Upper middle income
Estonia	High income: nonOECD	Portugal	High income: OECD
Finland	High income: nonOECD	Romania	Upper middle income
France	High income: OECD	Singapore	High income: nonOECD
Gambia, The	Low income	South Africa	Upper middle income
Georgia	Lower middle income	Spain	High income: OECD
Germany	High income: OECD	Sri Lanka	Lower middle income
Ghana	Low income	Sweden	High income: OECD
Greece	High income: OECD	Switzerland	High income: OECD
Guatemala	Lower middle income	Syrian Arab Republic	Lower middle income
Haiti	Low income	Thailand	Lower middle income
Honduras	Lower middle income	Trinidad and Tobago	High income: nonOECD
Hungary	High income: OECD	Tunisia	Lower middle income
India	Lower middle income	Turkey	Upper middle income
Indonesia	Lower middle income	Uganda	Low income
Iran, Islamic Re	Upper middle income	United Arab Emirates	High income: nonOECD
Ireland	High income: OECD	United Kingdom	High income: nonOECD
Italy	High income: OECD	United States	High income: nonOECD
Italy	Upper middle income	Uruguay	Upper middle income
Jamaica	High income: OECD	Zambia	Low income
Japan	Lower middle income	Zimbabwe	Low income
Jordan	Lower middle income		