

Understanding the Growth of African Financial Markets

Mihasonirina Andrianaivo and Charles Amo Yartey
University of Rennes 1 - International Monetary Fund

2009 AFRICAN ECONOMIC CONFERENCE

November 11-13, 2009
Addis Ababa

Introduction

Significant development of African financial markets in recent years

- Increase in credit to the private sector
- Increase in the number of stock exchanges
- Rise of private equity funds
- Some developments in the debt markets

Most studies in the literature focus on financial development promoting growth

- Theoretical models of endogenous growth: Pagano (1993)
- Positive empirical link from financial development to economic growth: Goldsmith (1969), King and Levine (1993a), Levine and Zervos (1998), Levine et al. (2000), Kpodar (2005), Ang(2008)

... But little research has been done on the determinants of financial development and with a focus on Africa.

Objectives

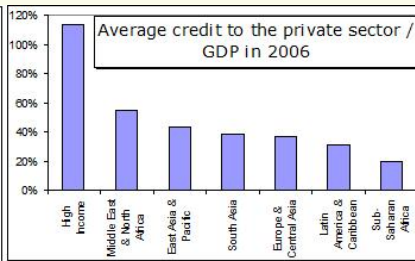
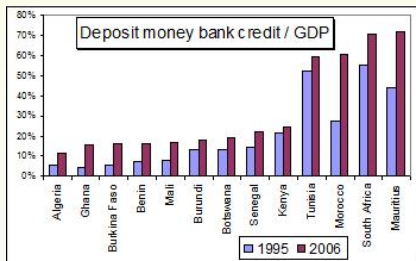
What we do in this paper:

- We document developments in African financial markets since 1990
- We analyze key features of African markets
- We model econometrically the determinants of financial market development
- We draw policy implications for promoting financial market development

Outline

- 1 Introduction
- 2 African financial markets
 - The banking system
 - The stock market
 - The private equity market
- 3 Literature review
- 4 Empirical model
- 5 Determinants of banking sector development
- 6 Determinants of stock market development
- 7 Conclusions

The banking system in Africa

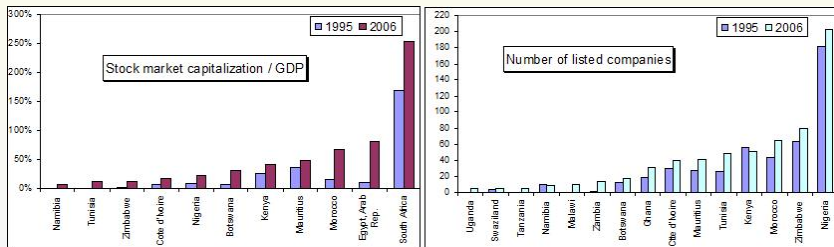


Source: data of Beck et al.(2008)

- Low financial depth (average bank credit to the private sector 15%), low penetration (5% on average), low maturity of credit
- Reasonably sound
 - Decrease in ratio of non performing loans,
 - Risk weighted capital adequacy ratio on average 16%,
- High profits, high concentration.

African stock markets (1)

Significant growth of African stock markets (increase of total market capitalization by 113% between 1995 and 2005)

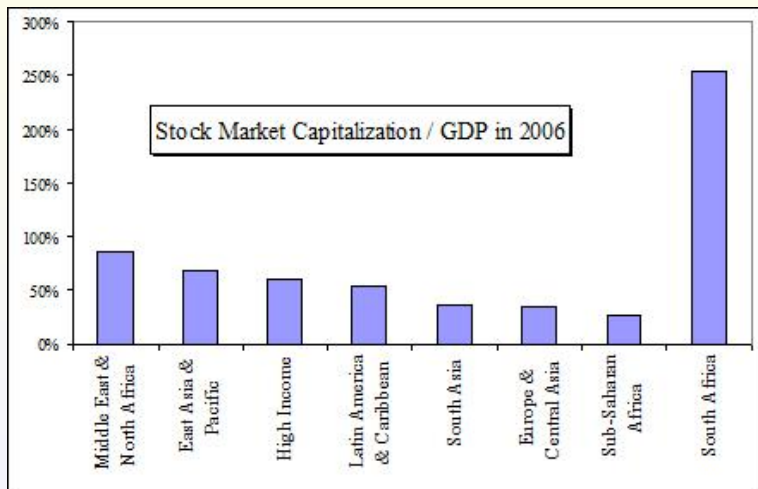


Source: data of Beck et al. (2008)

Today there exist 18 stock exchanges

African stock markets (2)

... But they are still small compared with the rest of the world



Source: [data of Beck et al. \(2008\)](#)



African stock markets (3)

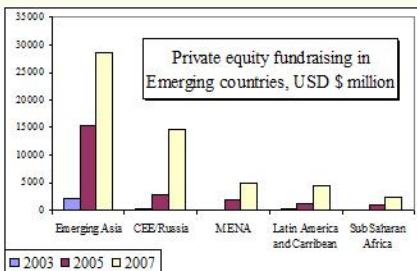
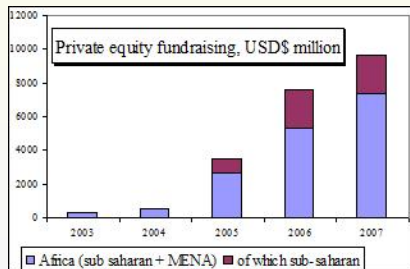
- Few companies listed (South Africa and Egypt account for more than 50% of all listed companies)
- Shares are rarely traded (low liquidity)
- Manual systems for most exchanges (trading, clearing and settlements are slow)
- Poor supervision

Nevertheless,

- High profits (diversification opportunity as not correlated with the global system and its associated risks)
- Positive impacts on private enterprises (Yartey, 2006)
- Vehicles for selling off state owned firms

African private equity markets (1)

There has been a boom in private equities during the last few years in Africa, even though still small by international standards



Source: EMPEA

African private equity markets (2)

- Main sectors: communications, commodities sector starting (OECD, 2008)
- Dominated by South Africa (80% of the shares) then Nigeria (10% of the shares)
- South Africa is comparable to the rest of the world: funds sizes are 2.8% of GDP in 2007, the global average is 2.1% and Europe average is 1.9%
- Source of capital: USA (50%), South Africa (25%), Europe and China
- Risk for private equity firm: lack of exit option through an IPO due to shallow and small stock exchanges
- Risks to the financial stability

Literature and questions (1)

On the determinants of financial development

- **Time invariant and historical factors:** Acemoglu *et al.* (2001), La Porta *et al.* (1997), Djankov, Mac Liesh and Schleifer (2005), Easterly and Levine (1997), Stulz and Williamson (2003)
- **Economic institutions:** Acemoglu, Johnson and Robinson (2004), Mc Donald and Schumacher (2007)
- **Trade and financial liberalization:** McKinnon (1991), Rajan and Zingales (2003), Chinn and Ito (2002, 2005), Claessens, Klingebiel and Schmukler (2003), Baltagi, Demestriades and Law (2008)
- **Macroeconomic environment:** Azariadis and Choi (1996), Levine (1997, 2003, 2005)

... But little research considers stock market development on the one hand and banking sector development on the other hand

... And very few research on Africa.

Literature and questions (2)

On the determinants of stock market development (SMD)

- Calderon-Rossell (1991) model:

$$SMD \nearrow = F(\text{income} \nearrow, \text{liquidity} \nearrow)$$

- Financial intermediaries: Garcia and Liu (1999), Yartey (2007, 2008)
- Institutions: modified Calderon-Rossell model that includes institutions: Yartey (2008)

... But little research corrects for endogeneity of the explanatory variables.

Methodology

$$FD_{i,t} = F(envt, open, inst)$$

- 1 We conduct two empirical analyses on
 - 1 banking sector development - baseline model: Mc Kinnon & Shaw hypothesis (1973)
 - 2 stock market development - baseline model: Calderon-Rossell model (1991)
- 2 We correct for the endogeneity within the model using GMM
- 3 We test a broader set of determinants

Method:

- Instrumental Variable - Generalized Method of Moments (IV-GMM) and
- System GMM (Blundell and Bond, 1998)

Model specification

Determinants of banking sector development

$$y_{i,t} = \alpha_1 y_{i,t-1} + \beta' X_{i,t} + \eta_i + \epsilon_{i,t}$$

Data for 53 African countries over 1990 - 2006 Sources: IFS, WDI, ICRG, Beck *et al.* financial structure database (2008), Djankov, Mac Liesh and Schleifer (2005), Chinn and Ito (2002, 2006)

Determinants of stock market development

$$y_{i,t} = \beta' X_{i,t} + \eta_i + \epsilon_{i,t}$$

Data for 17 African countries over 1990 - 2006 Sources: IFS, WDI, ICRG, Beck *et al.* financial structure database (2008)

Dependent variables

For banking sector development

- Deposit money bank credit to the private sector / GDP
- Deposit money bank assets / (central and deposit money bank) assets ; as a robustness check

For stock market development

- Stock market capitalization: Value of listed shares/GDP

Note

$F_t^* = [0.5 (F_t/Pe_t + F_{t-1}/Pe_{t-1})] / (GDP_t/Pa_t)$ where F is bank credit to the private sector or stock market capitalization, Pe is end-of period CPI, and Pa is average annual CPI

Explanatory variables (1)

For banking sector development

	Variables	Expected Signs
MACROECONOMIC ENVIRONMENT (envt)		
Income levels (Y)	Real GDP per capita	+
Environment	Investments	+
	Savings	+
Macroeconomic stability	Inflation	-
	Inflation volatility	-
	Real interest rates	+/-
OPENNESS (open)		
Trade openness	Trade openness	+
Financial openness	Reserve requirements	-
	Capital account liberalization	+
Capital flows	Remittances	+
	Foreign direct investments	+
INSTITUTIONS (inst)		
Security of transactions	Creditor rights	+
Institutional development	Political risk	+
	Law	+
	Corruption (low level)	+
	Bureaucratic quality	+
	Government stability	+

Explanatory variables (2)

For stock market development

Variables		Expected Signs
MACROECONOMIC ENVIRONMENT (envt)		
Income levels (Y)	Real GDP per capita	+
Environment	Investments	+
	Savings	+
Macroeconomic stability	Inflation	-
	Inflation volatility	-
	Real interest rates	-
OPENNESS (open)		
Trade openness	Trade openness	+
	Commodity prices	+
Financial openness	Capital account liberalization	+
Capital flows	Remittances	+
	Foreign direct investments	+
INSTITUTIONS (inst)		
Institutional development	Political risk	+
	Law	+
	Corruption(low level)	+
	Bureaucratic quality	+
	Government stability	+
SPECIFIC FACTORS FOR STOCK MARKET DEVELOPMENT		
Banking development	Bank credit to the private sector	+ / -
Stock market liquidity	Stock market liquidity	+

Definitions

Capital account liberalization - source Chinn and Ito (2002, 2005)

- First principal components of IMF variables including existence of multiple exchange rates, restrictions on current account, share of capital account transactions, requirement of surrender export proceeds

Political risk rating - source ICRG

- 100 points scale and assigns a numerical value to a predetermined range of risk components
 - including government stability, internal and external conflicts, corruption, law and order, ethnic tensions, bureaucratic quality...
- Highest value to the lowest risk

On banking sector development (1)- System GMM

Dependent variable: Private credit/GDP

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Lagged Dependent	0.999 (0.037)***	0.998 (0.026)***	0.868 (0.027)***	0.857 (0.055)***	0.926 (0.022)***	0.843 (0.082)***	0.824 (0.075)***
Real GDP per cap.	0.054 (0.046)	0.056 (0.042)	0.127 (0.080)	0.175 (0.063)***	0.157 (0.056)***	0.192 (0.080)**	0.169 (0.077)*
Inflation volatility	-0.857 (0.389)**		-1.040 (0.367)***	-0.174 (0.608)	0.291 (0.630)	-2.993 (1.799)*	-2.702 (1.184)**
Reserve requir.	-0.037 (0.021)*	-0.047 (0.020)**	-0.009 (0.017)	-0.014 (0.023)	-0.130 (0.035)***	-0.003 (0.020)	-0.041 (0.021)*
Trade openness	0.088 (0.051)*	0.077 (0.023)***	-0.082 (0.062)	0.074 (0.051)	0.468 (0.132)***	0.117 (0.059)**	0.001 (0.052)
Political risk	0.304 (0.167)*	0.218 (0.104)**	0.005 (0.216)	0.408 (0.062)***	0.378 (0.151)**	0.625 (0.183)***	
Creditor rights	0.145 (0.023)***	0.163 (0.035)***	0.223 (0.063)***	0.140 (0.035)***	0.137 (0.040)***	0.037 (0.048)	0.140 (0.037)***
Inflation		-0.304 (0.049)***					
Remittances			0.058 (0.012)***				
Financial open.				-0.039 (0.014)***	-0.031 (0.011)***	0.036 (0.028)	-0.207 (0.090)**
Trade openness * Reserve requir.					-0.163 (0.047)***		
Trade openness * Financial open.						0.126 (0.045)***	
Law							0.247 (0.116)**
Financial open. * Law							0.138 (0.074)**
Observations	350	352	296	322	322	322	308
N. groups	28	28	28	27	27	27	26
AR(2) (p-value)	0.2348	0.1669	0.3811	0.1741	0.1416	0.1334	0.3579
Sargan (p-value)	0.5985	0.7057	0.849	0.9716	0.9605	0.9976	0.9986

On banking sector development (2)- System GMM

Dependent variable: Bank assets/Total financial assets

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Lagged Dependent	0.540 (0.020)***	0.689 (0.009)***	0.431 (0.027)***	0.477 (0.028)***	0.507 (0.042)***	0.485 (0.038)***	0.454 (0.027)***
Real GDP per cap.	0.647 (0.047)***	0.112 (0.042)***	0.262 (0.035)***	0.711 (0.028)***	0.676 (0.062)***	0.714 (0.036)***	0.564 (0.076)***
Inflation volatility	-1.165 (0.370)***		-0.341 (0.238)	-2.398 (0.575)***	-2.617 (0.726)***	-2.763 (0.701)***	-3.420 (0.416)***
Reserve requir.	-0.061 (0.007)***	-0.063 (0.006)***	-0.029 (0.006)***	-0.080 (0.008)***	0.017 (0.018)	-0.078 (0.008)***	-0.041 (0.008)***
Trade openness	-0.018 (0.028)	0.131 (0.010)***	-0.101 (0.020)***	0.012 (0.015)	-0.400 (0.073)***	0.133 (0.035)***	0.203 (0.057)***
Political risk	0.274 (0.101)***	0.175 (0.038)***	0.447 (0.031)***	0.215 (0.094)**	0.226 (0.135)*	0.141 (0.154)	
Creditor rights	0.047 (0.012)***	-0.098 (0.016)***	-0.024 (0.015)	0.056 (0.017)***	0.055 (0.021)***	0.059 (0.017)***	0.014 (0.031)**
Inflation		-0.310 (0.034)***					
Remittances			0.036 (0.004)***				
Financial open.				-0.075 (0.012)***	-0.073 (0.014)***	0.019 (0.035)	-0.120 (0.055)**
Trade openness * Reserve requir.					0.151 (0.026)***		
Trade openness * Financial open.						0.107 (0.032)***	
Law							0.051 (0.051)**
Financial open. * Law							0.090 (0.036)**
Observations	346	346	290	316	316	316	302
N. groups	29	29	29	29	29	29	28
AR(2) (p-value)	0.586	0.3591	0.4271	0.5234	0.4971	0.5157	0.4146
Sargan (p-value)	0.6748	0.5369	0.8275	0.3981	0.4183	0.4262	0.9691

On stock market development - FE/RE estimator

Dependent variable: Stock market capitalization/GDP

FE/RE	Model 1 RE	Model 2 FE	Model 3 FE	Model 4 RE	Model 5 RE	Model 6 RE
L. Real GDP per cap.	0.218 (0.141)	0.116 (0.135)	1.228 (0.469)**	0.027 (0.168)	0.189 (0.151)	0.075 (0.147)
L. Savings	0.155 (0.060)**	0.216 (0.058)***	0.177 (0.066)**	0.145 (0.061)**	0.222 (0.091)**	0.095 (0.097)
L. Real interest rates	-0.304 (0.398)		-0.017 (0.402)	-0.125 (0.411)	-0.081 (0.386)	0.280 (0.375)
Stock market liquidity	0.214 (0.028)***	0.243 (0.028)***	0.212 (0.036)***	0.202 (0.030)***	0.239 (0.035)***	0.220 (0.036)***
Bank private credit	0.521 (0.134)***	0.464 (0.110)***	0.567 (0.178)***	0.514 (0.146)***	0.402 (0.131)***	0.523 (0.124)***
L. Inflation		0.357 (0.927)				
Financial openness			-0.028 (0.046)	-0.936 (0.235)***		-4.206 (0.957)***
L. Real GDP per cap. * Financial openness				0.130 (0.033)***		
Political risk					0.921 (0.341)***	1.133 (0.322)***
Political risk * Financial openness						0.997 (0.228)***
Observations	134	146	122	114	108	99
N. groups	14	15	14	13	12	12
R-squared	0.69	0.75	0.65	0.62	0.79	0.78
Fisher (p-value):	15.04	17.40	11.96	11.77	13.86	11.21
R-squared (betw.) :	0.78	0.70	0.79	0.80	0.58	0.85
Hausman (p-value):	0.59	0.00	0.03	0.82	0.28	0.31

On stock market development - GMM Estimation

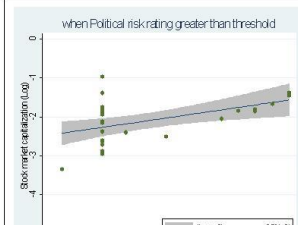
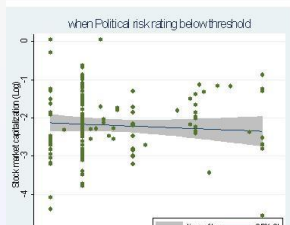
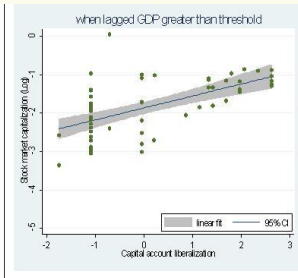
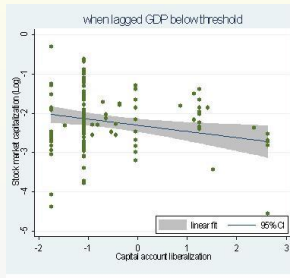
Dependent variable: Stock market capitalization/GDP

	Model 1 RE	Model 2 FE	Model 3 FE	Model 4 RE	Model 5 RE	Model 6 RE
Real GDP per cap.	0.082 (0.213)	0.437 (0.500)	0.650 (0.956)	-0.006 (0.245)	0.209 (0.283)	0.335 (0.496)
Savings	0.319 (0.109)***	0.579 (0.176)***	0.456 (0.201)**	0.337 (0.131)**	0.358 (0.178)**	0.006 (0.377)
Real interest rates	-1.201 (1.681)		-1.001 (1.513)	-0.344 (2.028)	-0.617 (1.598)	1.616 (2.889)
Stock market liquidity	0.216 (0.032)***	0.293 (0.049)***	0.233 (0.078)***	0.216 (0.035)***	0.238 (0.039)***	0.190 (0.066)***
Bank private credit	0.647 (0.202)***	0.466 (0.207)**	0.815 (0.346)**	0.562 (0.230)**	0.406 (0.212)*	0.416 (0.250)*
Inflation		-3.273 (5.072)				
Financial openness			0.047 (0.091)	-0.675 (0.255)***		-5.317 (1.987)***
Real GDP per cap. * Financial openness				0.100 (0.035)***		
Political risk					0.985 (0.355)***	0.956 (0.419)**
Political risk * Financial open.						1.258 (0.460)***
Observations	127	137	114	116	102	94
N. groups	14	14	12	14	12	12
R-squared	0.7798	0.61	0.5206	0.7679	0.7986	0.8275

Financial openness and stock market development.

Results suggest that the marginal effect of capital account liberalization is positive when

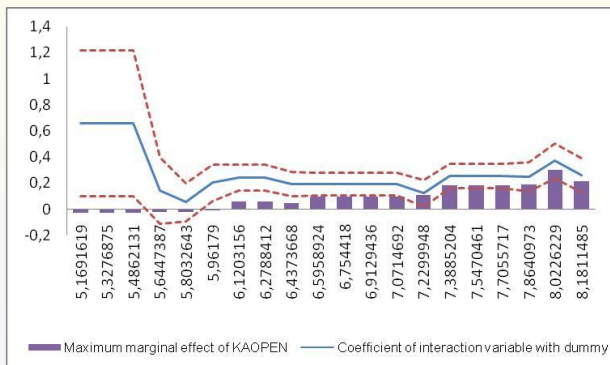
- real GDP per cap. > \$1,300
- and/or political risk index > 70 points



Simulations (1)

Threshold of lagged GDP and KAOPEN - Threshold variable: income level

$y_{i,t} = \alpha_0 + \beta X_{i,t} + \alpha_1 KAOPEN_{i,t} + \alpha_2 KAOPEN_{i,t} * DUMMY_{i,t} + \eta_j + \epsilon_{i,t}$, where $DUMMY = 1$ if $THRESHOLD \geq j$ and 0 otherwise. Window variation: [5th percentile, 95th percentile]; Number of iterations: 20; Estimation: robust random effects (including RISK in the control variables); dotted lines are 90% confidence intervals



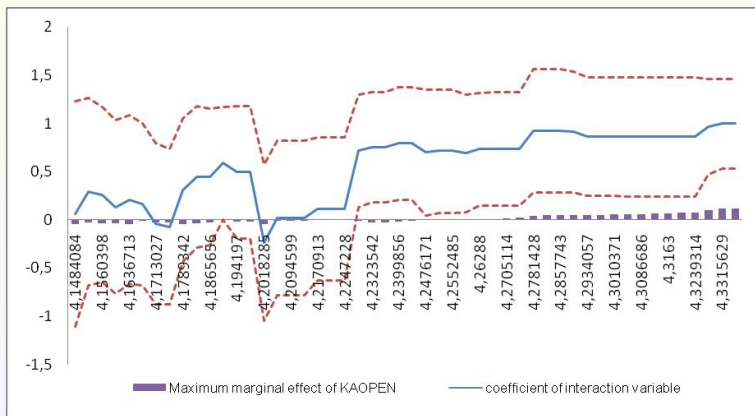
Simulations (2)

Recursive simulation including interaction variable - Threshold variable: RISK

$y_{i,t} = \alpha_0 + \beta X_{i,t} + \alpha_1 KAOPEN_{i,t} + \alpha_2 KAOPEN_{i,t} * THRESHOLD_{i,t} + \eta_i + \epsilon_{i,t}$, if

$THRESHOLD \leq j$. Window variation: [50th percentile, 95th percentile] Number of iterations: 50

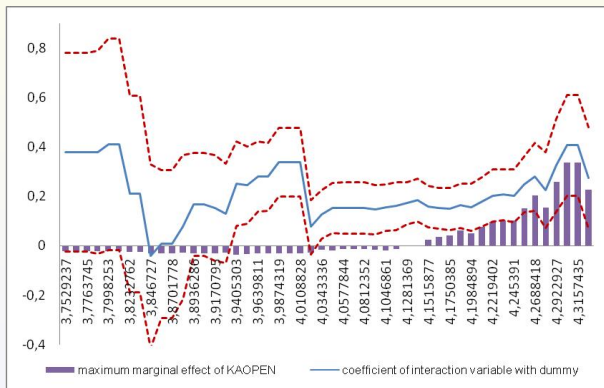
Estimation: robust random effects ; dotted lines are 90% confidence intervals



Simulations (3)

Threshold of RISK and KAOPEN - Threshold variable: RISK

$y_{i,t} = \alpha_0 + \beta X_{i,t} + \alpha_1 KAOPEN_{i,t} + \alpha_2 KAOPEN_{i,t} * DUMMY_{i,t} + \eta_i + \epsilon_{i,t}$, where $DUMMY = 1$ if $THRESHOLD \geq j$ and 0 otherwise. Window variation: [5th percentile, 95th percentile] Number of iterations: 50 Estimation: robust random effects ; dotted lines are 90% confidence intervals



Summary and conclusions (1)

Banking sector development:

favored by

- high levels of income
- institutional development
 - low political risk
 - better creditor rights protection
- trade openness and remittances

impeded by

- high inflation
- financial repression

on capital account liberalization:

- interaction between trade openness and financial openness
 - high levels of financial repression reduce the positive effects of trade openness on banking sector development
 - partial evidence of the simultaneous opening hypothesis of capital account and current account of Rajan and Zingales (2003), Baltagi *et al.* (2008)
- interaction between financial openness and rule of law
 - solid legal environment favors banking sector development as in La Porta *et al.* (1997)
 - in countries with sufficient legal development, capital account liberalization has a positive impact on banking sector development as in Chinn and Ito (2002, 2006).

Summary and conclusions (2)

For stock market development:

favored by:

- savings rate
- institutional development
- stock market liquidity
- banking sector development (banks and markets complement each other)

on capital account liberalization:

- interaction between financial openness and income levels
 - in countries with higher income, capital account liberalization have positive effects
- interaction between financial openness and political risk
 - lower degree of political risk promotes stock market development
 - in countries with sufficient institutional development, capital account liberalization favors stock market development