EC569 Economic Growth
Seminar 5

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Kose, M. A., Prasad, E. S., & Terrones, M. E. (2009). Does openness to international financial flows raise productivity growth?. Journal of International Money and Finance, 28(4), 554-580.

Impact of Financial Openness on TFP Growth

- more efficient resource allocation (Mishkin (2006))
- development of domestic financial sector
- improvements in institutions
- better macroeconomic policies
- technology and managerial expertise transfer due to FDI

- **de jure capital account openness:** the absence of restrictions on capital account transactions
- **de facto financial integration:** stocks of foreign assets and liabilities relative to GDP

Results

- More open capital accounts (de jure) generally have higher TFP
- Overall de facto financial integration does not matter for growth
- Disaggregate financial openness into different kinds of capital flows
  - FDI and portfolio equity boost TFP growth
  - External debt liability is negatively correlated with TFP growth
  - Better developed financial markets and better institutions attenuate negative debt - TFP growth relationship

FDI

- adoption of new production methods
- education/training of labor force
- competition induced efficient use of existing resources
- stable and less prone to reversals

Equity Flows

- Deepening and development of domestic financial markets
- Improvements in corporate governance among domestic firms
- stable and less prone to reversals

Debt Flows

- Loosen financial constraints
- Do not solve the agency problems
- Inefficient capital allocation if domestic banks are poorly supervised
- Moral hazard if debt is guaranteed by the government or international institutions
- procyclical and highly volatile

Methodology and Data

- Dynamic panel regression
- Non-overlapping ten-year growth rates
- system GMM, instruments: lagged levels and lagged first differences of regressors
- Data: Penn World Tables (Version 6.2), World Bank data, IMF data
- 67 countries (21 industrial and 46 developing) from 1966 to 2005.

Regression

$$y_{i,t} - y_{i,t-1} = \gamma y_{t,t-1} + \beta' \mathrm{FO}_{i,t} + \psi' Z_{i,t} + \mu_t + \eta_i + \epsilon_{i,t}$$

- $y_{i,t}$: Log of TFP
- $y_{i,t-1}$: log of TFP at the beginning of each ten-year period
- $\mathrm{FO}_{i,t}$: set of financial openness measures
- $Z_{i,t}$: set of relevant control variables
- μ_t: time dummies
- η_i: country fixed effects
- $\epsilon_{i,t}$: error term

Table 3
Financial openness and TFP growth: panel regressions (dependent variable – TFP growth; ten-year panel).

	FE				System GMM			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Initial TFP (in logs)	−0.61287***	−0.61490***	−0.61065***	−0.61220***	−0.38540**	−0.23962*	−0.36105**	−0.27305**
	[0.08458]	[0.08493]	[0.08610]	[0.08596]	[0.16861]	[0.12245]	[0.15379]	[0.12840]
Trade openness (% GDP)	0.00498**	0.00531**	0.00452**	0.00486**	0.00175	0.00045	0.00146	0.00109
	[0.00215]	[0.00227]	[0.00215]	[0.00220]	[0.00209]	[0.00227]	[0.00219]	[0.00250]
Terms of trade (% Change)	0.00177	0.00173	0.00196	0.00180	0.00255	0.00404	0.00292	0.00365
	[0.00436]	[0.00435]	[0.00436]	[0.00440]	[0.00746]	[0.00696]	[0.00745]	[0.00679]
Population growth	−0.02407	−0.01742	−0.03441	−0.02662	−0.06310	−0.06925	−0.05737	−0.06107
	[0.04098]	[0.04575]	[0.04570]	[0.04586]	[0.05113]	[0.05004]	[0.04971]	[0.04730]
Private sector credit (% GDP)	0.00116**	0.00124**	0.00100*	0.00112*	0.00251**	0.00261**	0.00293***	0.00311***
	[0.00054]	[0.00060]	[0.00055]	[0.00057]	[0.00102]	[0.00100]	[0.00108]	[0.00100]
Institutional quality	−0.00421	−0.00451	−0.00330	−0.00404	−0.01252	−0.01363	−0.01307	−0.01484
	[0.00619]	[0.00636]	[0.00616]	[0.00628]	[0.01149]	[0.01140]	[0.01163]	[0.01095]
Capital account openness (de jure)	0.07373**	0.07571**	0.06735*	0.07258**	0.15476**	0.10896**	0.14777**	0.12083**
	[0.03547]	[0.03555]	[0.03550]	[0.03516]	[0.06056]	[0.04984]	[0.06009]	[0.05300]
Total liabilities (% GDP)		−0.00017				−0.00031		
		[0.00037]				[0.00058]		
Total assets (% GDP)			0.00028				−0.00027	
			[0.00019]				[0.00039]	
Total liabilities + assets (% GDP)				0.00003				−0.00028
				[0.00013]				[0.00024]
R-squared	0.674	0.674	0.676	0.674				
Countries					67	67	67	67
Observations	252	252	252	252	252	252	252	252
Specification tests (*p*-value)								
Hansen test of overidentification					0.211	0.331	0.346	0.464
2nd Order correlation					0.178	0.168	0.177	0.172
Number of instruments					18	20	20	20

Note: The dependent variable is the growth rate of TFP over each 10-year period. Total liabilities and assets refer to gross external liabilities and assets, respectively. Robust standard errors are reported in brackets. The symbols *, ** and *** indicate statistical significance at the 10%, 5% and 1%, levels, respectively. All regressions include time dummies.

Does de jure openness matter to TFP growth?

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Does de facto openness matter to TFP growth?

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- The coefficient estimates imply that an economy with an open capital account has, over a ten-year horizon, annual TFP growth that is about 0.11–0.15 percentage points higher than an economy that has extensive capital controls.
- While an open capital account by itself says nothing about an economy's actual level of integration into international financial markets, many of the efficiency gains from competition, technology transfers, spillovers of good corporate and public governance practices, etc. may be associated with an open capital account.

Does the composition of external liabilities matter to TFP growth?

Table 4
Does the composition of external liabilities matter (dependent variable – TFP growth; ten-year panel?).

	FE	System GMM	FE	System GMM	FE	System GMM
Initial TFP (in logs)	−0.62192***	−0.40691***	−0.62104***	−0.39140***	−0.63541***	−0.25950**
	[0.08526]	[0.11832]	[0.08417]	[0.12317]	[0.08321]	[0.11885]
Trade openness (% GDP)	0.00482*	0.00245	0.00465*	0.00125	0.00519**	0.00088
	[0.00251]	[0.00185]	[0.00260]	[0.00134]	[0.00250]	[0.00150]
Terms of trade (% change)	0.00176	0.00184	0.00268	−0.00121	0.00218	−0.00562
	[0.00426]	[0.00722]	[0.00385]	[0.00724]	[0.00386]	[0.00798]
Population growth	−0.00869	−0.10333***	−0.00497	−0.09451***	−0.00914	−0.05474
	[0.04369]	[0.03124]	[0.04290]	[0.03192]	[0.04371]	[0.04614]
Private sector credit (% GDP)	0.00101*	0.00180*	0.00064	0.00128	0.00042	0.00065
	[0.00058]	[0.00093]	[0.00063]	[0.00092]	[0.00060]	[0.00094]
Institutional quality	−0.00275	−0.00938	−0.00261	−0.01273	0.00188	−0.00973
	[0.00693]	[0.00972]	[0.00708]	[0.00877]	[0.00708]	[0.00995]
Capital account openness (de jure)	0.05249	0.08216*	0.03685	0.04967	0.02837	0.03830
	[0.03849]	[0.04638]	[0.03741]	[0.04595]	[0.04312]	[0.05047]
FDI and equity liabilities (% GDP)	0.00201***	0.00379**	−0.00141	0.00607***	0.00022	0.00695***
	[0.00066]	[0.00161]	[0.00190]	[0.00220]	[0.00246]	[0.00207]
Debt liabilities (% GDP)	−0.00178**	−0.00247**	−0.00229*	−0.00383***	−0.00305**	−0.00378***
	[0.00069]	[0.00096]	[0.00122]	[0.00117]	[0.00116]	[0.00087]
Private sector credit × FDI and equity liabilities			0.00361*	−0.00332		
			[0.00196]	[0.00228]		
Private sector credit × debt liabilities			0.00033	0.00261**		
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Institutional quality × FDI and equity liabilities					0.00101	−0.00640***
					[0.00240]	[0.00223]
Institutional quality × debt liabilities					0.00226*	0.00392***
					[0.00120]	[0.00120]
R-squared	0.702		0.710		0.715	
Countries		67		67		67
Observations	248	248	248	248	248	248
Specification tests (*p*-value)						
Hansen test of overidentification		0.470		0.849		0.295
2nd Order correlation		0.126		0.253		0.248
Number of instruments		23		26		26

Note: The dependent variable is the growth rate of TFP over each 10-year period. Total liabilities refer to gross external liabilities. FDI and equity liabilities are the sum of gross FDI and gross portfolio equity liabilities. Debt liabilities are gross external debt liabilities, including sovereign and portfolio debt. Robust standard errors are reported in brackets. The symbols *, ** and *** indicate statistical significance at the 10%, 5% and 1%, levels, respectively. All regressions include time dummies.

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- The GMM results indicate that a 10 percentage point increase in the ratio of FDI and equity liabilities to GDP would be associated with about a 0.4 percentage points increase in annual TFP growth over a ten-year period.
- A similar increase in the ratio of debt liabilities to GDP would be associated with TFP growth that is lower by about 0.2 percentage points.
- It is possible that countries with weaker institutional frameworks and weakly-supervised financial institutions (which may not be fully captured by our composite measures of these characteristics) get more debt flows, which finance politically well-connected local firms that then grow bigger and stronger, to the detriment of other firms.
- An interesting result is that there is a significant positive coefficient on the interaction between private sector credit and the stock of debt liabilities. That is, having well-developed financial markets substantially attenuates the negative impact of debt inflows on TFP growth. The size

- Somewhat surprisingly, we also find that improvements in institutional quality reduce the effects of FDI and portfolio equity liabilities on TFP growth. The implication is that, when an economy has attained a very high level of institutional development, even FDI flows don?t make much of a difference to TFP growth. While these results are statistically significant, however, the coefficient estimates indicate that, even at the highest level of institutional quality in our sample, the estimated marginal effect of an increase in FDI and equity liabilities is still positive and that of an increase in debt liabilities is still negative.
- This links up with a growing literature suggesting that the overall growth benefits of financial integration are higher above certain thresholds, and the risks are lower.

Financial system

Weil (2013):
Financial system directs capital towards its most productive use by

- evaluating potential returns from different investment projects
- pooling the savings of many individuals to allow for large investments
- monitoring the outcomes of investment projects to make use investors are properly compensated
- spreading the risk of any one project among a large number of individuals

Financial system eases transactions (more specialization)

Beck, T., Levine, R., & Loayza, N. (2000). Finance and the Sources of Growth. Journal of financial economics, 58(1-2), 261-300.

Financial development $\Rightarrow$ productivity $\uparrow$

- reduces the costs of acquiring information about firms and managers (Gertler, 1988)
- lowers the costs of conducting transactions (Levine, 1997)
- provides more accurate information about production technologies and exerts corporate control (Boyd and Prescott, 1986; Greenwood and Jovanovic, 1990; King and Levine, 1993b)
- facilitates risk management, improves the liquidity of assets available to savers, and reduces trading costs
    - encourages investment in higher-return activities (Obstfeld, 1994; Bencivenga and Smith, 1991; Greenwood and Smith, 1997).

Financial development $\Rightarrow$ capital accumulation $\uparrow$

- Higher returns ambiguously affect savings rates, due to well-known income and substitution effects.
- greater risk diversification opportunities have an ambiguous impact on savings rates (Levhari and Srinivasan (1969))

Financial intermediation and economic development

Channels through which financial intermediation affect economic development

- productivity increase
  - allocation of savings to productive projects (Schumpeter (1911))
- capital accumulation
  - higher saving rates
  - attracting foreign capital

This paper

Empirically assess the impact of financial intermediaries on

- private savings
- capital accumulation
- productivity growth
- overall economic growth

Measures of financial intermediary development

- Private Credit: the value of credits by financial intermediaries to private sector divided by GDP
- Liquid Liabilities: currency plus demand and interest-bearing liabilities of financial intermediaries and nonbank financial intermediaries, divided by GDP
- Commercial-Central Bank: the ratio of commercial bank domestic assets divided by commercial bank plus central bank domestic assets.

Estimation, cross-section

$$Y_i = \alpha + \beta \text{Finance}_i + \gamma' X_i + \epsilon_i$$

X : Conditioning information set (simple)

- Initial real per capita GDP
  - control for convergence
- years of schooling
  - control for human capital

Conditioning information set (policy)

- inflation rate and ratio of government expenditure to GDP
  - control for macroeconomic stability
- sum of exports and imports as a share of GDP and the black market premium
  - control for degree of openness

Instruments

- legal origin: England, France, Germany, or Scandinavia
- affects creditors' rights, contract enforcement, accounting standards
- English system: more investor friendly
- French system: least investor friendly

Estimation, panel

$$y_{i,t} = \alpha' X^1_{i,t-1} + \beta' X^2_{i,t} + \mu_i + \lambda_t + \epsilon_{i,t}$$

$$y_{i,t} - y_{i,t-1} = \alpha'(X^1_{i,t-1} - X^1_{i,t-2}) + \beta'(X^2_{i,t} - X^2_{i,t-1}) + (\epsilon_{i,t} - \epsilon_{i,t-1})$$

System GMM

Results

- robust, positive link between financial intermediary development and both real per capita GDP growth and total factor productivity growth.
- ambiguous results on the link between financial development and physical capital growth and savings
  - a positive and significant relation between financial intermediary development and the growth rate of capital per capita
  - alternative measures of financial development: inconsistent results

Table 2: Financial intermediation and economic growth

	Cross-country data		Panel data	
	(1)	(2)	(3)	(4)
Constant	6.571	2.643	1.272	0.082
	0.006	0.527	0.250	0.875
Initial income per capita	− 1.971	− 1.967	− 1.299	− 0.496
	0.001	0.001	0.001	0.001
Average years of schooling	1.936	1.548	2.671	0.950
	0.008	0.078	0.001	0.001
Openness to trade		0.931		1.311
		0.042		0.001
Inflation		4.270		0.181
		0.096		0.475
Government size		− 1.207		− 1.445
		0.132		0.001
Black market premium		− 0.139		− 1.192
		0.914		0.001
Private Credit	2.215	3.215	2.397	1.443
	0.003	0.012	0.001	0.001
Hansen test	0.577	0.571		
Sargan test (p-value)			0.183	0.506
Serial correlation test (p-value)			0.516	0.803
Countries	63	63	77	77
Observations			365	365

- Financial intermediation $\Rightarrow$ economic development
- Mexico
  - Private credit $=$ 22.9% of GDP
  - Exogenously increase it to 27.5% (sample median)
  - $(\ln(27.5) - \ln(22.9)) \times 2.2 = .4$ percentage point increase in growth rate per year

Table 3: Financial intermediation and productivity growth

	Cross-country data		Panel data	
	(1)	(2)	(3)	(4)
Constant	3.527 0.065	− 1.189 0.717	2.473 0.001	− 1.611 0.033
Initial income per capita	− 1.266 0.001	− 1.171 0.001	− 1.244 0.001	− 0.353 0.001
Average years of schooling	1.375 0.028	1.241 0.060	3.043 0.001	1.174 0.001
Openness to trade		0.956 0.015		1.337 0.001
Inflation		3.223 0.096		− 0.415 0.033
Government size		− 0.647 0.286		− 0.431 0.088
Black market premium		− 0.191 0.861		− 1.003 0.001
Private Credit	1.500 0.004	1.986 0.021	1.332 0.001	0.296 0.001
Hansen test	2.036	3.472		
Sargan test (p-value)			0.205	0.401
Serial correlation test (p-value)			0.772	0.865
Countries	63	63	77	77
Observations			365	365

- financial intermediary development has a large, significant impact on productivity growth.
- The results for the panel regressions confirm the pure cross-country estimates.
- Mexico
  - Private credit $=$ 22.9% of GDP
  - Exogenously increase it to 27.5% (sample median)
  - $(\ln(27.5) - \ln(22.9)) \times 1.5 = .3$ percentage point increase in productivity growth rate per year

Table 4: Financial intermediation and capital growth

	Cross-country data		Panel data	
	(1)	(2)	(3)	(4)
Constant	8.448 0.004	8.349 0.093	– 1.273 0.219	5.694 0.001
Initial income per capita	– 2.075 0.001	– 2.225 0.001	– 0.933 0.001	– 0.070 0.701
Average years of schooling	0.663 0.427	0.628 0.559	0.985 0.055	– 0.340 0.552
Openness to trade		0.245 0.663		– 0.448 0.097
Inflation		4.196 0.236		0.445 0.360
Government size		– 1.619 0.082		– 3.229 0.001
Black market premium		0.304 0.826		– 0.748 0.001
Private Credit	2.832 0.006	4.038 0.012	3.435 0.001	3.005 0.001
Hansen test	6.747	3.039		
Sargan test (*p*-value)			0.166	0.316
Serial correlation test (*p*-value)			0.014	0.053
Countries	63	63	77	77
Observations			365	365

Financial intermediary development – physical capital accumulation

- less robust.
- In the pure cross-section results,
  - other measures of financial development (Liquid Liabilities and Commercial-Central Bank): not significant
- The panel results are more robust.
  - other measures of financial development: not significant
- Reject the null that no serial correlation.

Table 9: Alternative measures of financial intermediary development and capital growth, using cross-country data

Financial variable	Coefficient	*p*-value	Hansen test
Panel A: Regressions using the simple conditioning information set			
Liquid Liabilities	– 0.345	0.767	4.693
Commercial Central Bank	– 1.046	0.832	4.578
Private Credit	2.832	0.006	6.747
Panel B: Regressions using the policy conditioning information set			
Liquid Liabilities	0.511	0.562	4.605
Commercial Central Bank	1.018	0.755	4.722
Private Credit	4.038	0.012	3.039

Evidence on causal impact of financial development on economic growth

- The presence of good financial system preceded growth (King and Levine (1993))
- In the U.S., states began loosening branching restrictions.
  - faster economic growth on the states that liberalized banking
  - total quantity of banking credit did not rise
  - increase in efficiency (Jayaratne and Strahan (1996))
- in countries with well developed financial system, industries that depend on the financial system do well (Rajan and Zingales (1998))
- legal origin as instruments (GMM estimation) [Beck, Levine, and Loayza (2000)]
  - legal origin: England, France, Germany, or Scandinavia
  - affects creditors' rights, contract enforcement, accounting standards
  - English system: more investor friendly
  - French system: least investor friendly