EC569 Economic Growth
Seminar 4

İlhan Güner
School of Economics
University of Kent

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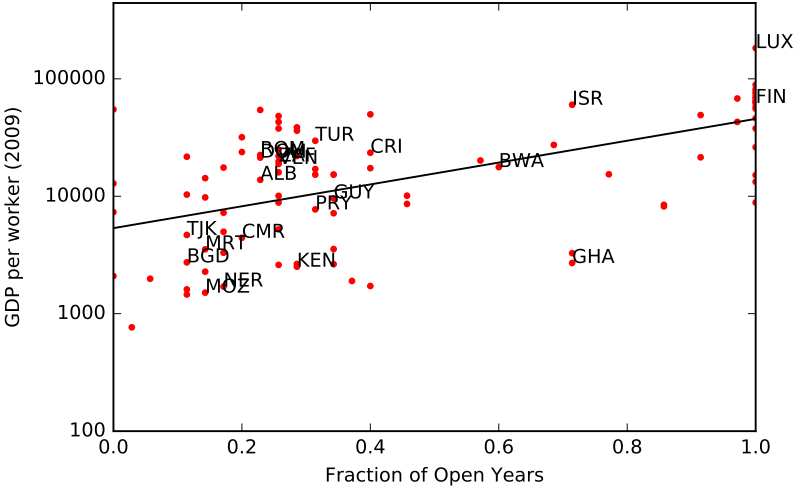

GDP per worker (2009)
100000
10000
1000
100
0.0
0.2
0.4
0.6
0.8
1.0
Fraction of Open Years
LUX
FIN
ISR
TUR
CRI
BWA
ALB
GUY
PRY
TJK
CMR
MRT
BGD
KEN
GHA
NER
MOZ

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.

$$Y = AK^{\alpha}(HL)^{1-\alpha}$$

$$\frac{Y}{L} = \frac{AK^{\alpha}(HL)^{1-\alpha}}{L} = A\left(\frac{K}{L}\right)^{\alpha} H^{1-\alpha}$$

$$\frac{Y}{L} = A\left(\frac{YK}{YL}\right)^{\alpha} H^{1-\alpha}$$

$$\frac{Y}{L} = A\left(\frac{K}{Y}\right)^{\alpha}\left(\frac{Y}{L}\right)^{\alpha} H^{1-\alpha}$$

$$\left(\frac{Y}{L}\right)^{1-\alpha} = A\left(\frac{K}{Y}\right)^{\alpha} H^{1-\alpha}$$

$$\left(\frac{Y}{L}\right) = A^{1/1-\alpha}\left(\frac{K}{Y}\right)^{\alpha/1-\alpha} H$$

$$g_{Y/L} = \left(\frac{1}{1-\alpha}\right) g_A + \left(\frac{\alpha}{1-\alpha}\right) g_{K/Y} + g_H$$

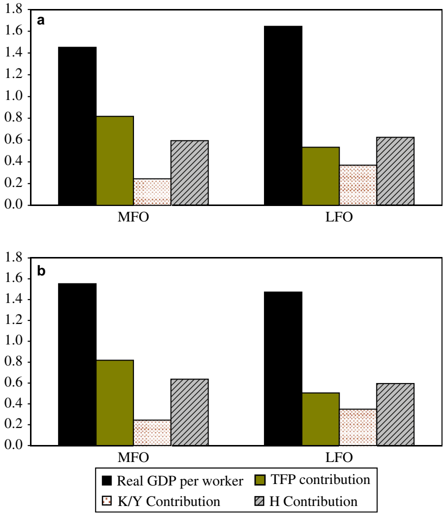

Fig. 1. (a) Growth accounting for more and less financially open economies (de facto measure of financial integration). Notes: A de facto measure of financial integration (the ratio of the stock of external liabilities to GDP) is used to define MFO and LFO economies. MFO and LFO refer to more financially open and less financially open economies, respectively. (b) Growth accounting for more and less financially open economies (de jure measure of capital account openness). Notes: A de jure measure of capital account openness (Schindler, in press) is used to define MFO and LFO economies. MFO and LFO refer to more financially open and less financially open economies, respectively.

- The contribution of TFP growth to per-worker output growth is larger in MFO economies

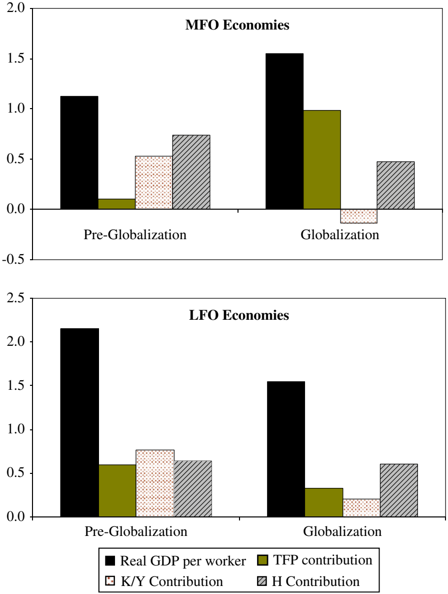

Fig. 2. Growth accounting for more and less financially open economies (de facto measure of financial integration. Constant sample). Notes: Pre-globalization, 1966–1985; globalization, 1986–2005. A de facto measure of financial integration (the ratio of the stock of external liabilities to GDP) is used to define MFO and LFO economies. MFO and LFO refer to more financially open and less financially open economies, respectively.

- physical and human capital accumulation were the largest contributors to GDP growth in the earlier period
- the contribution of TFP growth increased dramatically during the globalization period.
- in LFO economies, the contribution of TFP growth fell slightly during the globalization period and output growth was mostly attributed to the accumulation of both types of capital. It is also in

Regression

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

- $y_{i,t}$: Log of TFP
- $y_{i,t-1}$: log of TFP at the beginning of each ten-year period
- $\mathsf{FO}_{i,t}$: 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.

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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.

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

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***
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Private sector credit × FDI and equity liabilities			0.00361*	−0.00332		
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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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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**		
			[0.00131]	[0.00113]		
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.

- 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.