

ECON 4311 – Economy of Latin America

Lecture 3: Economic Growth and Latin America (pt. 3)

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Outline

- 1 Introduction
- 2 Capital and Output
- 3 TFP and Output
- 4 Growth Accounting in Latin America
 - Structural Reforms

Introduction

- ▶ Second part of the class:
 - The growth of the capital stock
 - TFP growth
 - Talk about growth accounting in Latin America
 - A little bit more on institutions
 - Structural reforms
 - The labor market
 - Infrastructure

Capital and Output

- ▶ Increases in the capital-per-worker K/L ratio lead to:
 1. Higher output per worker
 2. Higher real wages
- ▶ These relationships have been supported by both models and data.
 - Bonus points for volunteers who can prove either of these statements.

Capital and Output

Table: The capital-labor ratio and GDP per capita in Latin America, 2017.

Country	K/L ratio	GDP per capita (constant 2010 USD)
High income	17,900	41,655.4
Latin America	3,675	9,377.6
Middle income	3,789	4,998.6
Chile	6,789	15,059.5
Uruguay	4,903	14,362.6
Brazil	2,941	10,913.8
Mexico	4,592	9,942.9
Ecuador	3,343	5,256.0
El Salvador	1,496	3,463.5
Nicaragua	1,381	2,016.3

Data. World Bank.

Capital and Output

- ▶ **Question:** How does the capital stock grow over time?
 - **Domestic Savings.**
 - **Foreign Direct Investment.**

- ▶ In the capital-output relationship, the financial sector plays a key role:
 - (Commerical and investment) banks allocate resources across firms.
 - Efficient allocation of capital leads to faster growth.

Capital and Output

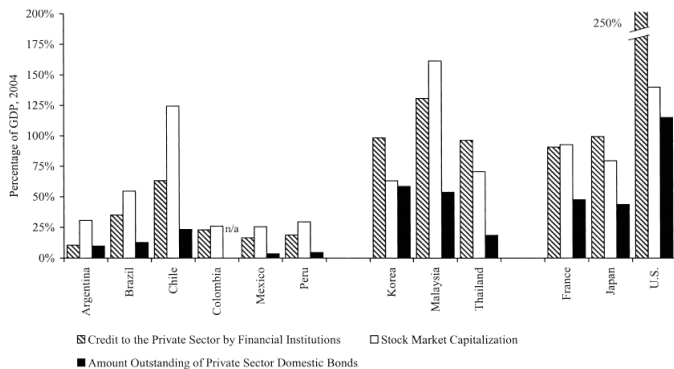
	1990			2017		
	<i>FDI (% of GDP)</i>	<i>Savings (% of GDP)</i>	<i>Total (% of GDP)</i>	<i>FDI (% of GDP)</i>	<i>Savings (% of GDP)</i>	<i>Total (% of GDP)</i>
Argentina	1.3	16.0	17.3	1.8	13.5	15.3
Bolivia	0.6	9.5	10.1	1.9	15.8	17.7
Brazil	0.2	18.9	19.1	3.4	14.3	17.7
Chile	2.0	23.7	25.7	2.3	20.4	22.7
Colombia	1.0	20.9	21.9	4.5	16.4	20.9
Costa Rica	2.8	19.4	22.2	5.0	14.2	19.2
Ecuador	0.8	17.8	18.6	0.6	25.8	26.4
El Salvador	0.0	11.6	11.6	1.3	14.3	15.6
Guatemala	0.6	10.7	11.3	1.3	14.1	15.4
Honduras	0.9	13.7	14.6	5.5	20.9	26.4
Mexico	1.0	19.8	20.8	2.8	22.9	25.7
Nicaragua	0.1	15.7	15.8	6.5	23.9	30.4
Panama	2.1	16.4	18.5	7.7	29.1	36.8
Paraguay	1.3	19.8	21.1	1.3	24.0	25.3
Peru	0.2	13.1	13.3	3.2	20.2	23.4
Uruguay	0.4	14.1	14.5	-1.6	16.1	14.5
Venezuela, RB	0.9	29.6	30.5	0.2	8.9	9.1
Latin America	0.7	19.5	20.2	3.0	17.3	20.3
Low income	0.2	14.1	14.3	3.3	18.8	22.1
Middle income	0.6	27.6	28.2	1.9	31.3	33.2
High income	1.0	21.5	22.5	2.6	23.0	25.6
World	0.9	23.3	24.2	2.3	25.3	27.6

Source: Course textbook. **Data:** World Bank.

Capital and Output

The Importance of the Financial Sector

The financial sector in Latin America provided less access to credit (in relative terms) than other high- and middle-income economies.



Source: De la Torre, Gozzi, Schmukler (2006).

TFP and Output

- ▶ We said that TFP can be thought of as to include many things:
 - Technological progress
 - Management practices
 - Institutions
 - \vdots

- ▶ While this is true, a more honest answer (as we will briefly see) would have been that TFP is a measure of our ignorance.
 - From a practitioner's standpoint, TFP is “the residual”.
 - It captures all that we cannot explain with a given model.

TFP and Output

Simple Growth Accounting.

- ▶ Recall the basic equation of the Solow's growth model:

$$Y_t = A_t K_t^\alpha L_t^{1-\alpha}, \quad \alpha \in (0, 1).$$

- ▶ Taking logs:

$$\log Y_t = \log A_t + \alpha \log K_t + (1 - \alpha) \log L_t.$$

- ▶ Suppose we observe data on Y_t, K_t, L_t , and that we know $\alpha_t \in (0, 1)$. Then, we can recover *TFP* as:

$$\log A_t = \log Y_t - \alpha_t \log K_t - (1 - \alpha_t) \log L_t.$$

TFP and Output

Regression Analysis.

- ▶ Suppose we are a bit more ambitious in our exercise, and we do not only want to recover TFP but also estimate α .
- ▶ Let us observe time series of Y_t, K_t, L_t .
- ▶ Again, from the Cobb-Douglas production function, we can get:

$$\log Y_t = \log A_t + \alpha \log K_t + (1 - \alpha) \log L_t.$$

- ▶ Using regression analysis, we can estimate α and recover A from:

$$\log Y_t = \widehat{\log A_t} + \hat{\alpha} \log K_t + (1 - \hat{\alpha}) \log L_t.$$

Growth Accounting in Latin America

- ▶ Slightly more-complicated analyses that the ones described have been carried out to explain the contribution of each factor to GDP growth.
- ▶ **Question:** Can you guess what factor has been the biggest contributor to GDP growth in LatAm over the past 60 years?
... and the biggest impediment?

Table: Growth accounting in Latin America, 1960–2017

Country/Region	GDP growth	TFP	Capital	Skills	Labor
Emerging Asia	4.86%	1.72%	1.09%	1.28%	0.77%
Advanced Economies	2.71%	0.84%	0.92%	0.76%	0.20%
Rest of the World	2.60%	0.45%	0.98%	0.98%	0.20%
Latin America & Caribbean	2.40%	-0.20%	1.01%	0.92%	0.66%
United States	2.04%	0.79%	0.28%	0.59%	0.38%

Growth Accounting in Latin America

- ▶ GDP growth in LatAm lower than everywhere except the US.
- ▶ Capital and labor contributions less significant in advanced economies.
- ▶ Astonishing TFP growth in emerging Asia.
- ▶ If LatAm TFP growth would have been the same as in Asia...
... LatAm would be x3 richer today!

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Growth Accounting in Latin America

- ▶ Main factor to blame in LatAm growth's experience over the past 60 years is TFP!
- ▶ This points to many underlying reasons:
 - Institutions
 - Informal sector
 - Infrastructure
 - \vdots
- ▶ Let's look at these factors in some detail!

Institutions

- ▶ Countries that are at the top of the GDP per capita ranking in the region (e.g., Chile, Uruguay) also ranked high in terms of institutions

Table: Institutional quality world rankings, 2019

Country	Government			
	Corruption	effectiveness	Doing business	Competitiveness
US	22	16	8	1
Portugal	30	26	34	34
Spain	41	34	30	26
Chile	27	42	56	33
Uruguay	23	59	95	53
Mexico	138	89	54	46
Brazil	105		109	72
Nicaragua	152	141	132	104
Venezuela	168	179	188	127

Institutions

Structural reforms that modify for the better these aspects of doing business could go a long way in fostering GDP growth in the region.

Table: Starting a business in Latin America, 2018

Country	Procedure (number)	Time (days)	Cost (% of per capita income)	Rank
Mexico	8	8.4	16.2	54
Chile	7	6	5.7	56
Colombia	8	11	14	65
Costa Rica	10	23	9.5	67
Peru	8	24.5	9.9	68
Panama	5	6	5.4	79
Uruguay	5	6.5	22.6	95
Brazil	11	20.5	5	109
Argentina	11	11	5.3	119
Bolivia	14	43.5	46	156
Venezuela	20	230	391.3	188

Institutions

Taxation can also be an important burden in conducting businesses in LatAm, both in terms of pecuniary and non-pecuniary costs.

Table: Business taxes in Latin America, 2018

Country	Total tax (%)	Time to comply (hours)	Number of payments
Ecuador	32.3	664	8
Chile	34	296	7
Paraguay	35	378	20
Guatemala	35.2	248	8
El Salvador	35.6	180	7
Panama	37.2	408	36
Uruguay	41.8	163	20
Costa Rica	58.3	151	10
Venezuela	64.6	792	70
Brazil	65.1	1,958	9.6
Bolivia	83.7	1,025	42
Argentina	106	311.5	9

The Informal Sector

- ▶ Latin American countries are known for having large informal sectors
 - 55% of workers in Latin America.
 - 35% of workers in the informal sector in middle-income countries.
 - 50% of workers in low-income countries.
- ▶ Other measures of informality include computing the share of GDP that accrues to the informal sector.
 - Similar results.
- ▶ **Informality and TFP.**
 - Powell (2013): \uparrow informality, \downarrow TFP.
 - Busso, Fazio, and Algazi (2012) find, using Census data from Mexico, that formal firms are 84% more productive than informal firms.

Labor Markets

- ▶ Several studies ([Busso et al., 2013](#); [OECD, 2018](#); [Ohanian et al., 2018](#)) find that stringent labor-market regulations hinder growth.

- ▶ [Gwartney et al. \(2019\)](#) developed an index of labor-market flexibility that considers six factors:
 - Minimum wage.
 - Hiring and firing regulations.
 - Centralized collective bargaining.
 - Hours regulations.
 - Mandated cost of worker dismissal.
 - Conscription (e.g., military service).

Labor-Market Flexibility in Latin America

Country/Region	World rank
US	1
Portugal	38
Spain	67
Costa Rica	54
Paraguay	71
Nicaragua	75
Chile	78
Colombia	85
Panama	88
Peru	90
Mexico	91
El Salvador	96
Latin America	101
Uruguay	112
Brazil	131
Argentina	133
Venezeula	139

Source. [Gwartney et al. \(2019\)](#).

Infrastructure

- ▶ We've been saying all along that Latin American countries are relatively poor in infrastructure. What do the data say?

Table: Infrastructure quality in Latin America, 2017–2018.

Country	Overall	Electricity	Roads	Railroads	Ports	Air transport
World	4.2	4.5	4.0	3.3	4.1	4.4
Latin America	3.5	4.5	3.6	2.2	3.9	4.1
Chile	4.7	6.1	5.2	2.5	4.9	4.5
Panama	4.7	5.2	4.4	4.5	6.2	6.0
Ecuador	4.5	4.9	5.1	—	4.6	5.1
Mexico	4.1	4.9	4.4	2.8	4.3	4.4
Uruguay	3.6	6.0	3.3	1.2	4.9	5.3
Argentina	3.3	3.0	3.3	2.1	3.7	4.2
Brazil	3.1	4.5	3.1	2.0	3.1	3.9
Paraguay	2.6	2.6	2.4	—	3.3	2.6
Venezuela	2.5	2.1	2.8	1.5	2.7	2.7

Table Notes. From 1 (lowest) to 7 (highest). **Source.** [World Economic Forum](#).

Infrastructure

The lack of roads in the region, a well-known problem.

Table: Roads in Latin America, data from 2000-2015

Country/Region	Roads paved (%)	Road fatalities in 2015 (per 100,000)	Total fatalities
World	64.9	18.3	1.24M
Latin America	24.7	18.8	97,430
El Salvador	53.1	19	1,339
Guatemala	44.8	19.9	2,939
Panama	41.8	10.7	386
Mexico	37.8	11.8	15,062
Venezuela	34.0	41.7	—
Argentina	32.2	14.1	5,619
Chile	23.8	11.6	2,179
Colombia	14.4	18.9	8,107
Brazil	13.5	22.6	46,935
Uruguay	10.0	17.4	567

Sources: World Bank and World Health Organization.

Taking Stock

- ▶ Learnt about the connections between capital and GDP:
 - $\uparrow K/L \implies \uparrow$ GDP per capita, \uparrow real wages.
 - Capital stock financed with domestic savings and FDI.
 - Financial sector plays a key role.
 - Financial markets could be more developed in Latin America.

- ▶ Learn about the connection between TFP and GDP:
 - TFP, the residual, a measure of our ignorance.
 - TFP, thought to reflect many things: efficiency of technology, distortions, institutional quality, management practices, . . .
 - $\uparrow TFP \implies \uparrow$ GDP per capita.
 - Various ways to do growth accounting.

Taking Stock

- ▶ Growth accounting in Latin America:
 - Average GDP growth in LatAm over the last 60 years 2.40%.
 - ▶ With the benefit of hindsight, low growth rate.
 - ▶ Growth rate lower than in “average” advanced economy.
 - TFP has been the main impediment to growth in Latin America.
 - Capital, the biggest contribution to GDP growth over the past 60 years.
 - Second biggest contributor (and very close) is “skills”.

Taking Stock

What explains the negative TFP growth in Latin America?

- ▶ Poor institutional quality (e.g., high corruption, little government effectiveness, hard to do business, . . .).
- ▶ Large informal sector in Latin America.
 - 55% of labor force vs. 35% in middle-income countries.
- ▶ Inflexible labor markets.
 - Average LatAm country ranks 101 in terms of flexibility in the world.
- ▶ Lack and poor quality of infrastructure (e.g., roads, electricity).
- ▶ Lack of structural reforms.

Thank You!