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What happens with total factor productivity in Latin America? Versión ca + ah

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WorldKLEMS Conference

4-5 June 2018, Boston

OUTLINE

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INTRODUCTION

The growth accounting methodology

INTRODUCTION

How can negative total factor productivity growth happen and can it last for long?

Negative effects from recession should be short-lived once the economy recovers

Longer-term, TFP signals weaker technological progress and innovation an ongoing trend since decades

Increased rigidities in labor, product and capital markets lead to greater misallocation to less productive firms

Negative reallocation effects with more resources going to less productive sectors in the economy (EU KLEMS)

Caveat: TFP is a residual, so measurement error in output or inputs and unmeasured effects end up here

Van Ark (2014)

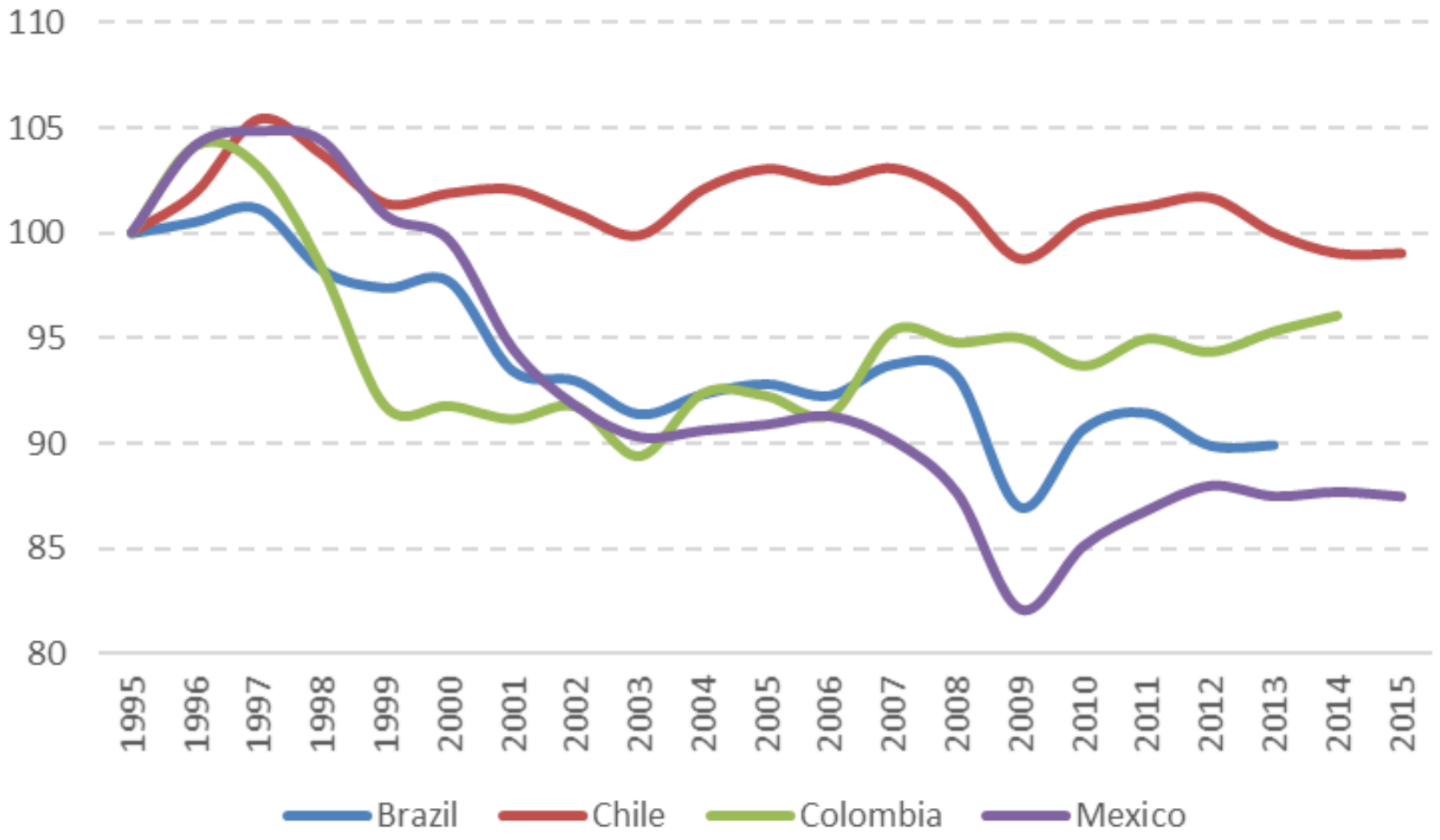
TABLE 1: Decomposition of gross output growth

(gross output-weighted annual growth rate in percent)

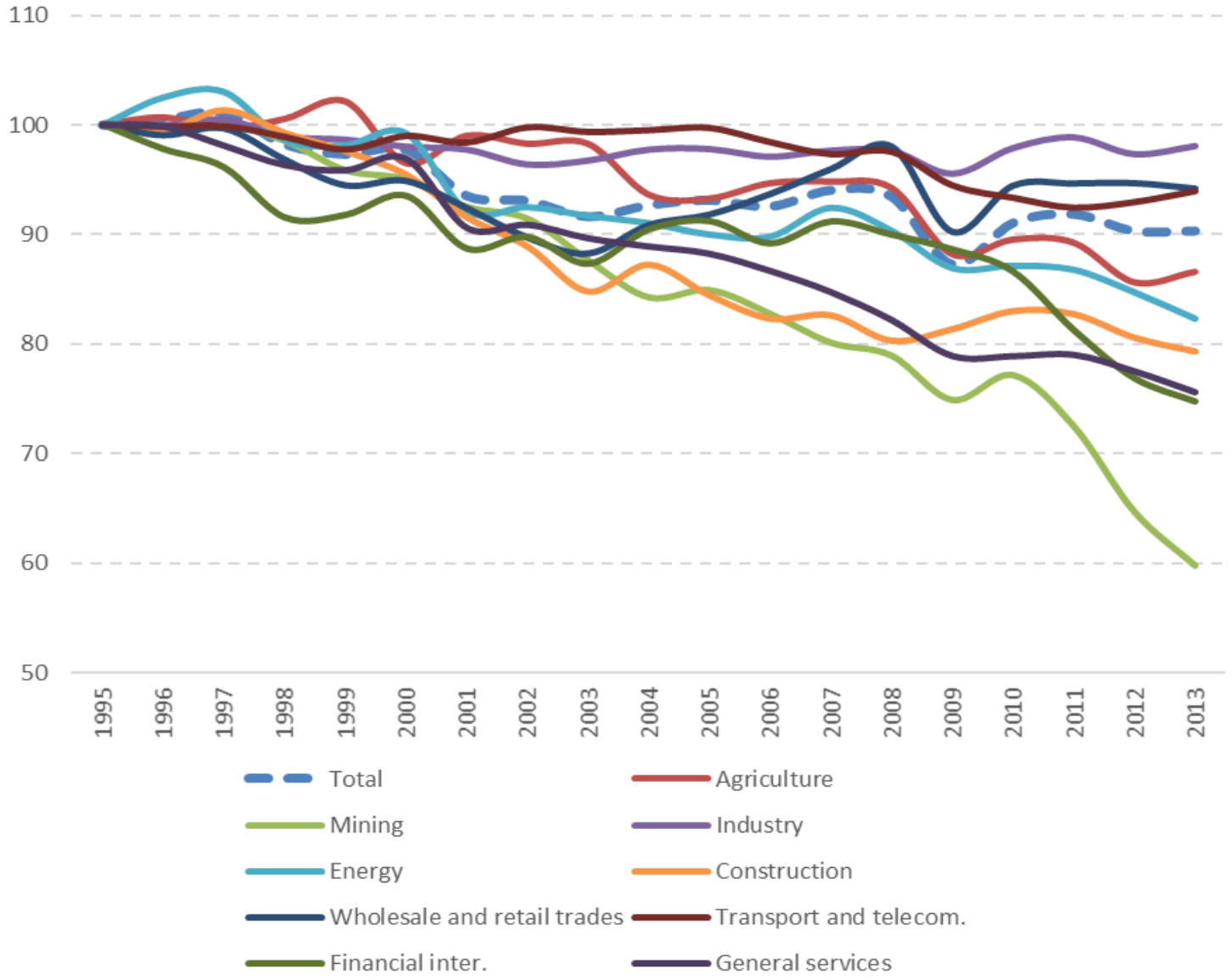
	Brazil*	Chile	Colombia**	Mexico
GO				
1996-2002	2.1%	3.4%	0.8%	4.1%
2003-2008	3.9%	5.0%	5.2%	3.2%
2009-2015	3.2%	2.9%	3.7%	2.1%
1996-2015	3.0%	3.7%	3.1%	3.1%
M				
1996-2002	1.1%	1.7%	0.2%	2.0%
2003-2008	2.1%	2.9%	2.5%	1.3%
2009-2015	1.6%	1.1%	1.5%	0.9%
1996-2015	1.6%	1.9%	1.4%	1.4%
K				
1996-2002	0.6%	1.1%	0.3%	2.2%
2003-2008	0.8%	1.3%	0.8%	1.7%
2009-2015	1.0%	1.4%	0.9%	1.1%
1996-2015	0.8%	1.3%	0.6%	1.7%
L				
1996-2002	1.0%	0.7%	1.2%	0.6%
2003-2008	1.0%	0.8%	1.6%	0.7%
2009-2015	0.8%	0.5%	1.4%	0.1%
1996-2015	0.9%	0.6%	1.4%	0.5%
TFP				
1996-2002	-0.5%	-0.1%	-0.9%	-0.7%
2003-2008	0.0%	-0.03%	0.26%	-0.5%
2009-2015	-0.3%	-0.2%	-0.1%	-0.03%
1996-2015	-0.3%	-0.1%	-0.2%	-0.4%

*1996-2013 **1996-2014

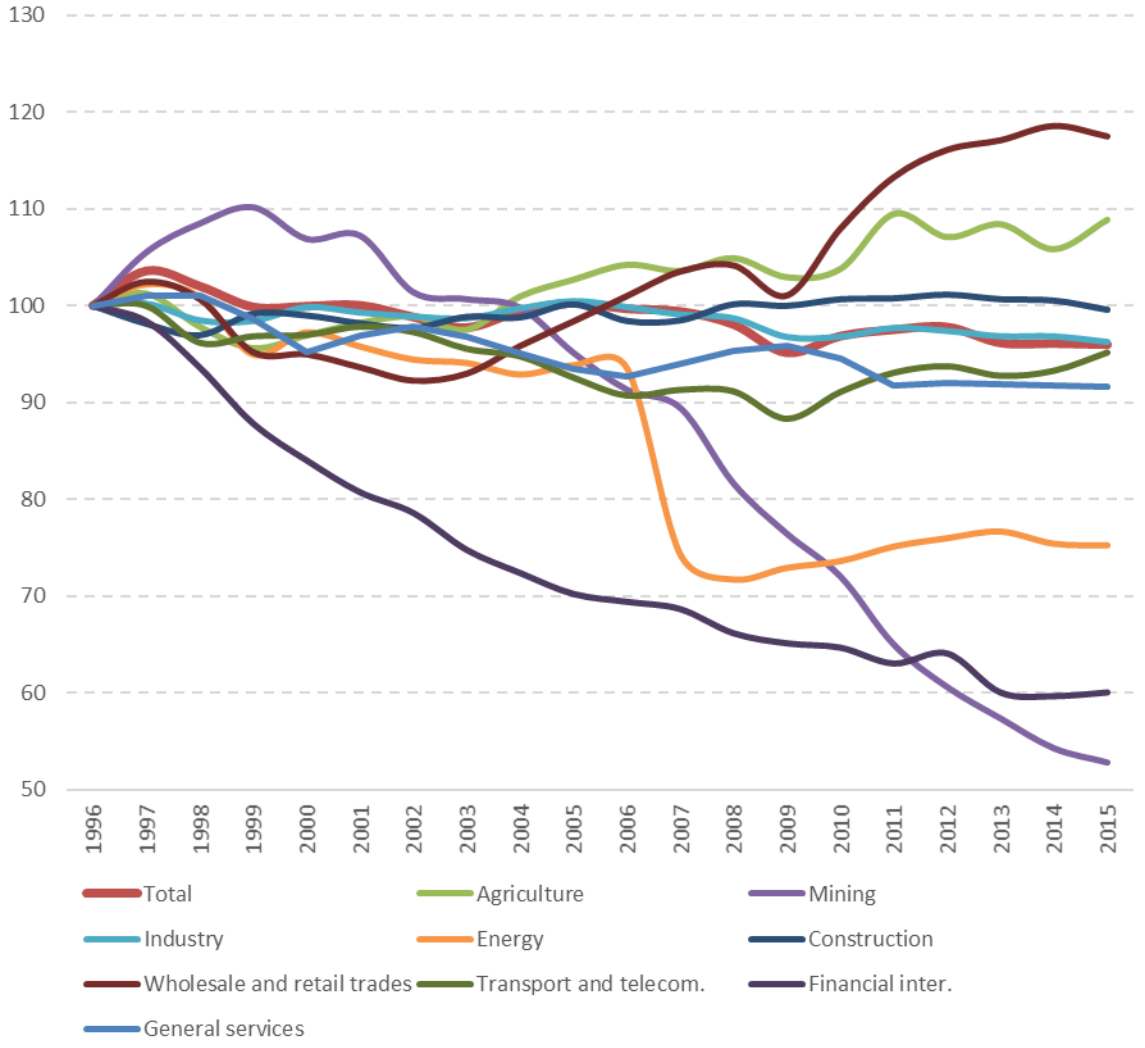
TOTAL FACTOR PRODUCTIVITY INDEX



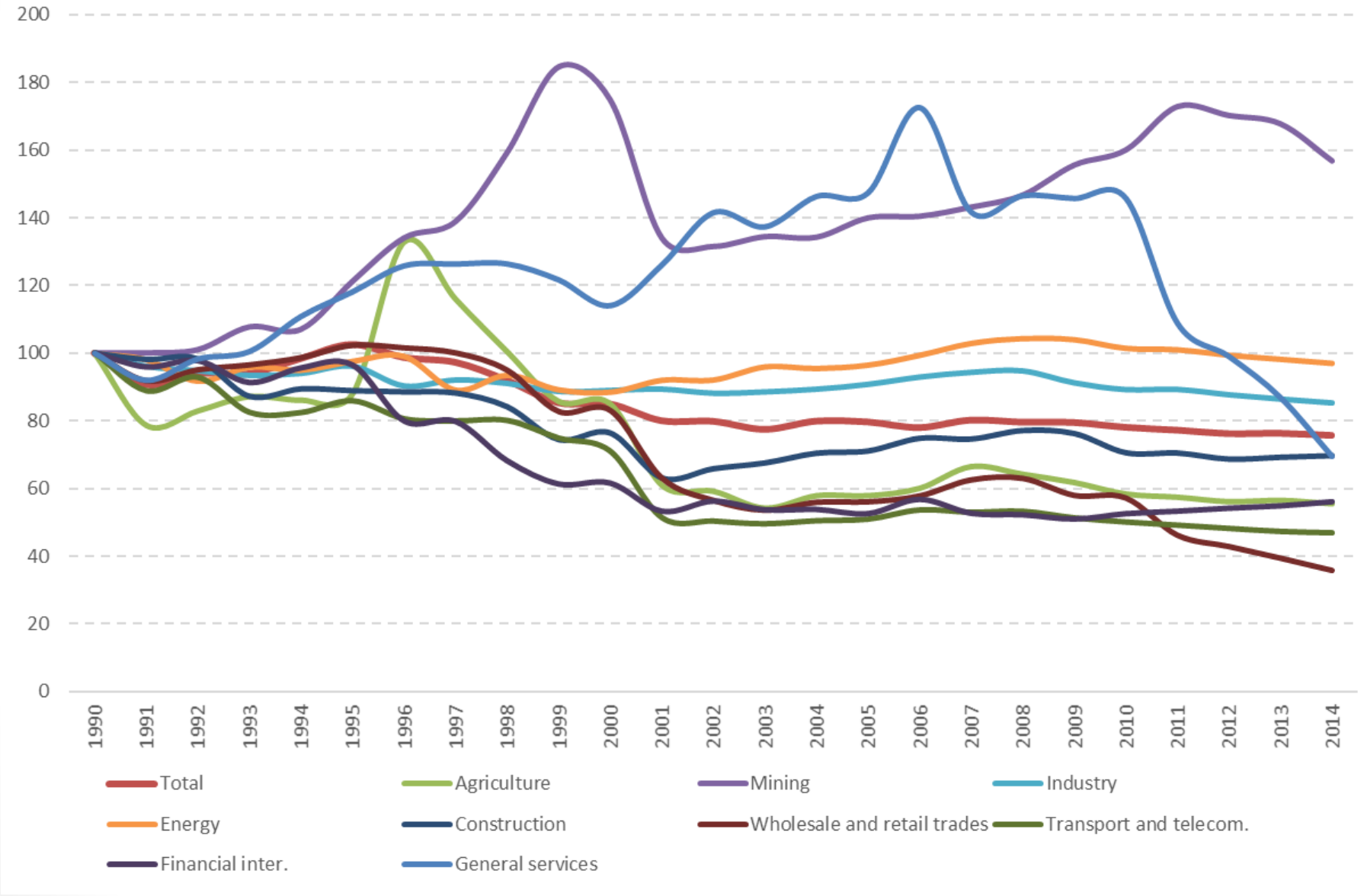
BRAZIL: total factor productivity index by industry group



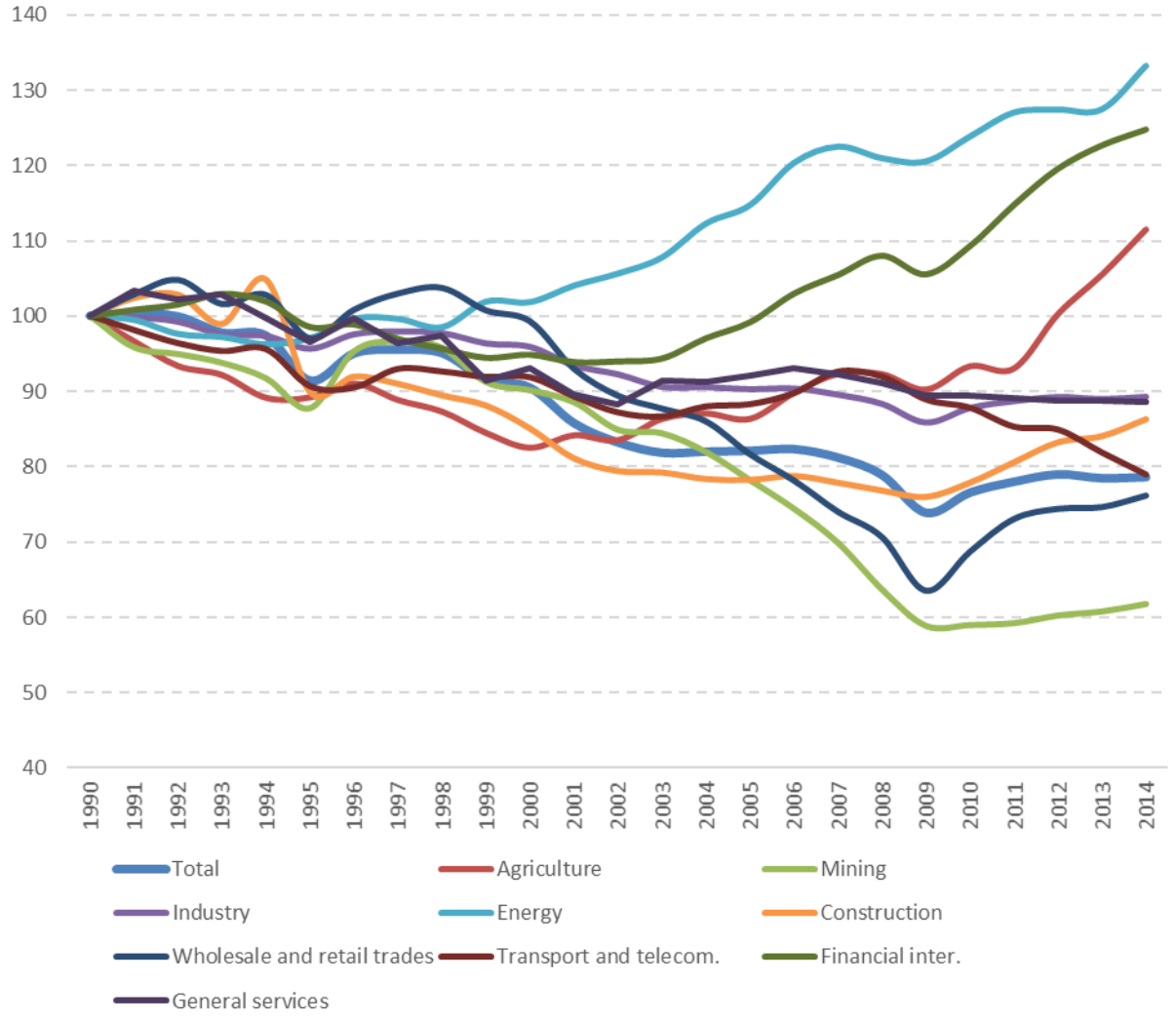
CHILE: total factor productivity index by industry group



COLOMBIA: total factor productivity index by industry group



MEXICO: total factor productivity index by industry



SOURCES OF GROWTH

These sources are are capital and labour input and TFP.

The growth accounting literature indicates the following components of TFP growth:

1.Technical and scientific progress (including improvements in management techniques).

2.Learning effects, either learning by doing or learning from others, or externalities; economies of scale.

3. Reallocation of inputs towards more (or less) productive uses.

4. Measurement error.

SOURCES OF GROWTH

Following Oulton a 5th component of TFP growth can be added.

5. Shifts in the structure of output and demand leading to changes in the aggregate growth rate of TFP and hence of aggregate labour productivity.

These shifts can be favourable or unfavourable.

Hulten (2001), Oulton (2016)

SOURCES OF GROWTH

Ad 1. Technical and scientific progress (including improvements in management techniques).

In the case of Latin America, this component can be potentially high because of the opportunities to import and after adjustment to the local situation introduce technical, scientific and managerial progress into production.

Ad 2. Learning effects, either learning by doing or learning from others, or externalities; economies of scale.

Again, Latin America has ample opportunities to reap benefits of this.

Ad 3. Reallocation of inputs towards more (or less) productive uses level.

Latin America has seen a rapid process of structural change but not always with positive effects on growth (De Vries et al., Rodrik and)

SOURCES OF GROWTH

Ad 4. Measurement error, either in production or with respect to factor inputs.

Examples are: Quantity or quality of human or physical capital are wrongly ignored. Huge production fluctuations can cause collapse of investment and subsequently the life of assets might change. Errors in the estimation of initial capital stock. TFP tends to be pro-cyclical in Latin America and this again hints to measurement problems. Some types of asset (such as intangibles) are wrongly omitted.

Ad 5. Shifts in the structure of output and demand.

Stylised fact in developed countries with respect to structural change: In all countries, resources have been shifting towards industries with lower than average TFP growth (Finance) or even negative TFP growth (Business services). But TFP growth in the market sector generally shows no long run tendency to decline. How is this possible (Oulton, 2016)?

Ad 1. Technical and scientific progress
(including improvements in management techniques). Persistence TFP

If TFP growth is caused by underlying developments in science and technology then we would expect TFP growth to be persistent. The benefit arising from some scientific or technological advance is not likely to be dissipated within a year; there is ample evidence that innovations (including improvements in managerial techniques) take time to diffuse across the firms within an industry.

Ad 1. Technical and scientific progress
(including improvements in management techniques). Persistence TFP

At the 9-sector level there appears to be significant persistence in TFP growth. But for the economy as a whole there is not substantial and statistically significant persistence. A likely explanation is that there are errors in the industry-level TFP estimates arising most probably from errors in the aggregation at industry-level value added.

Ad 1. Technical and scientific progress

(including improvements in management techniques). Persistence of TFP growth (4 countries and 9 sectors, 1996-2013). Dependent variable is growth of TFP

	(1) One lag	(2) Two lags	(3) Three lags	(4) Total Economy
TFP(-1)	0.097383***	0.1571***	0.1403***	-0.0034
	(0.035924)	(0.041192)	(0.0419)	(0.1189)
TFP(-2)		0.1293***	0.1905***	
		(0.0364)	(0.0417)	
TFP(-3)			-0.0685*	
			(0.0378)	
Observations	612	576	540	68
R-squared	0.069	0.107	0.130	0.034

Note: OLS estimates. Constant and dummies for country and industry included but not reported.

Ad 2. Learning effects, either learning by doing or learning from others, or externalities; economies of scale.

If the elasticity of output with respect to capital (the capital elasticity) has been understated by the capital share, then how large would it have to be to eliminate TFP entirely as a source of growth? Suppose our model is

$$y_t = Ak^{\gamma}h_0e^{\lambda t}$$

where y is output per hour, k is capital per hour, h is human capital per hour worked (labour quality), λ is the growth rate of labour quality, and γ is the capital elasticity which is now not necessarily equal to the capital share. Assume that TFP (A) is constant over time. Then the growth of output between time 0 and time t is given by

$$\gamma = \frac{\ln(y_t / y_0) - \lambda t}{\ln(k_t / k_0)}$$

Ad 2. Learning effects, either learning by doing or learning from others, or externalities; economies of scale.

	LC	VA/Hr	K/L	Capital share	Hypothetical capital elasticity
Brazil	0.7%	1.8%	1.4%	0.51	0.82
Chile	0.8%	2.7%	3.1%	0.46	0.61
Colombia	1.5%	3.0%	2.0%	0.37	0.76
Mexico	0.5%	1.6%	2.3%	0.70	0.50

Ad 2. Learning effects, either learning by doing or learning from others, or externalities; economies of scale.

The elasticity of output with respect to capital exceed capital's share.

This could be because of economies of scale. But at the industry level these seem likely to be important in only a few industries where a square-cube law prevails, such as pipelines or electricity generation.

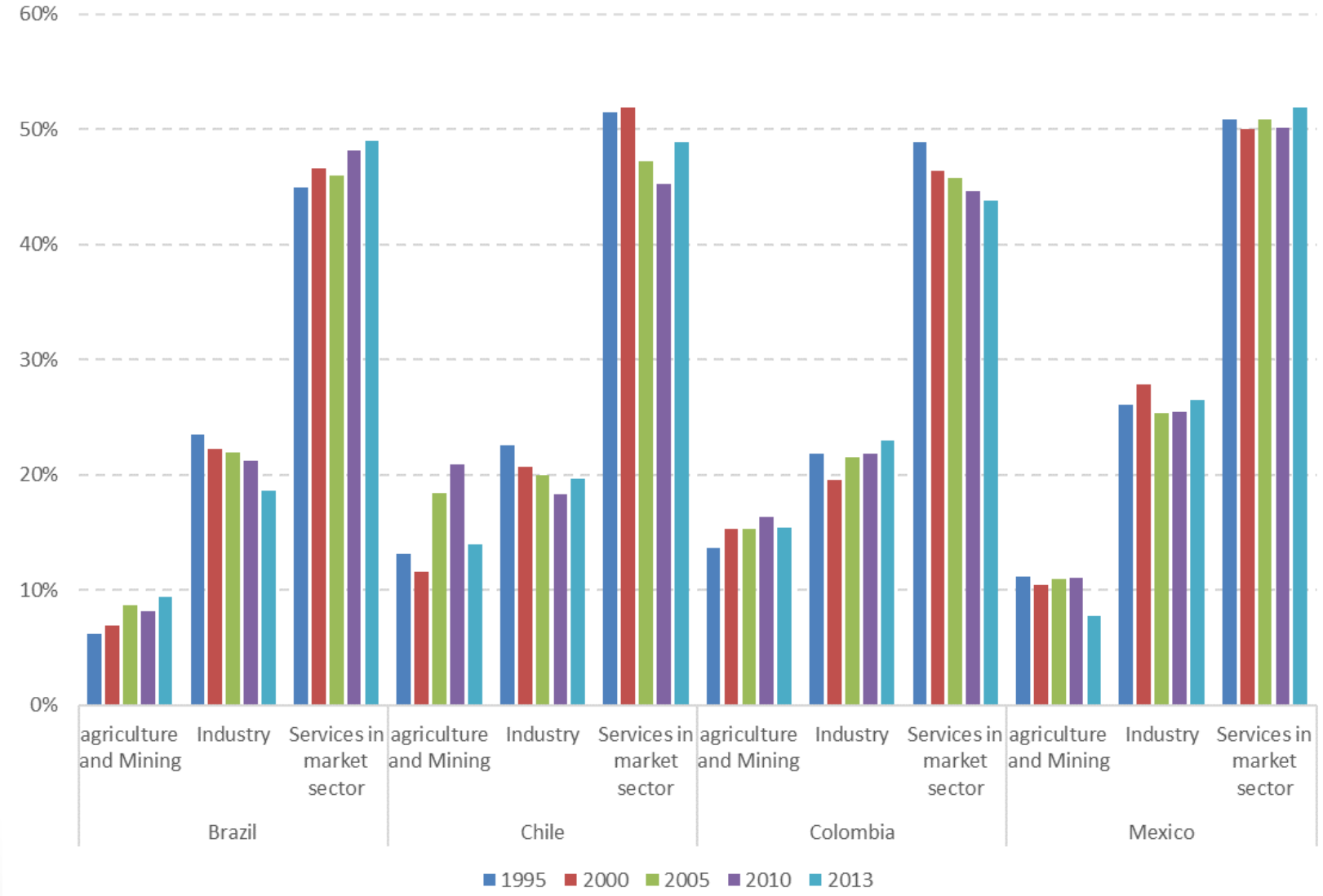
A more plausible reason is network externality effects as a new technology such as the Internet is deployed. Another is learning by doing arising from capital investment, either within the firm or by follower firms learning from early adopters.

But we found that the increase in the elasticity necessary to reduce the role of TFP to zero was far too large to be plausible (except Mexico).

Ad 3. TFP growth and the allocation of resources sectors: growth of TFP

In Brazil, Chile and Colombia the resources have been shifting out of manufacturing, where TFP growth is higher (lower in Colombia), and into in mining where it is low (high in Colombia). In Mexico the resources have been shifting out of mining and into in whole sale and retail trades, the two with low TFP.

Ad 3. TFP growth and the allocation of resources sectors: Value added share



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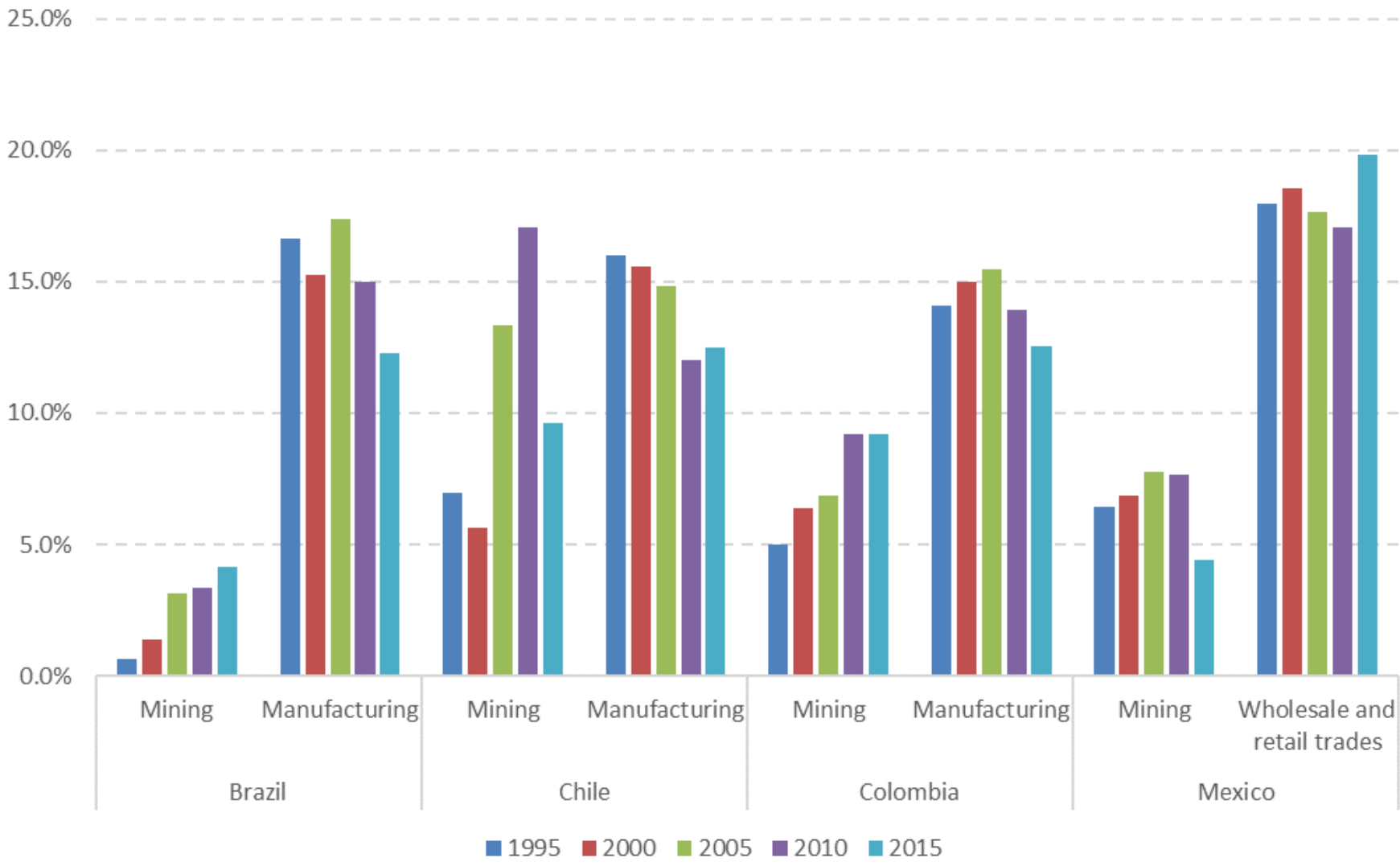

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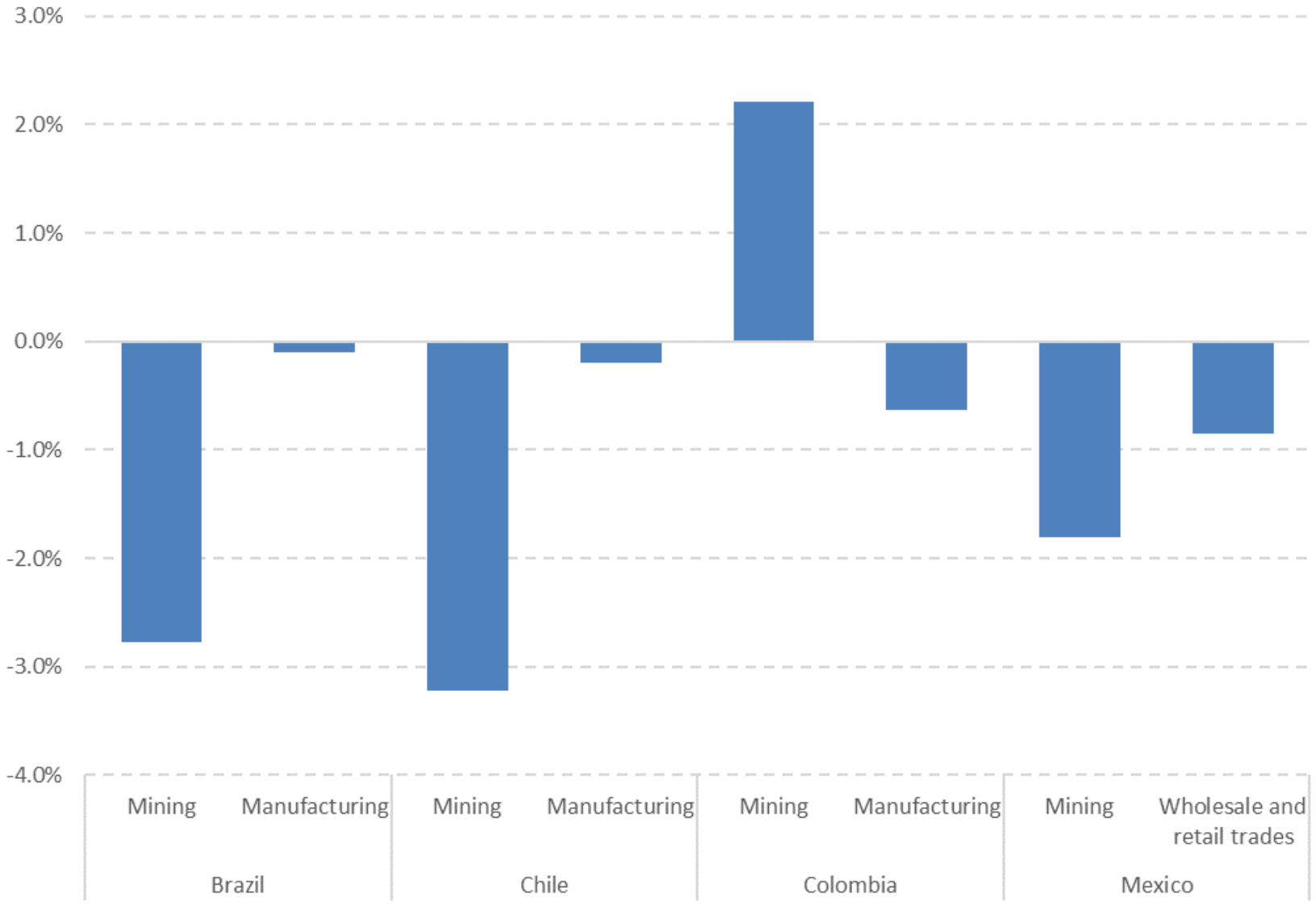


Ad 3. Brazil. The reallocation of resources (Total economy = 100)

Value Added

	Agriculture	Mining	Industry	Energy	Construction	Wholesale and retail trades	Transport and telecom.	Financial inter.	General services
1995	5.6%	0.6%	16.6%	2.4%	6.9%	12.0%	4.8%	25.9%	25.3%
2000	5.5%	1.4%	15.3%	3.1%	7.0%	10.3%	8.0%	25.2%	24.3%
2005	5.5%	3.1%	17.4%	3.4%	4.6%	12.4%	8.0%	22.2%	23.4%
2010	4.8%	3.3%	15.0%	2.8%	6.3%	14.7%	8.1%	22.5%	22.4%
2013	5.3%	4.2%	12.3%	2.0%	6.4%	15.9%	7.9%	23.2%	22.9%

Net Capital Stock

	Agriculture	Mining	Industry	Energy	Construction	Wholesale and retail trades	Transport and telecom.	Financial inter.	General services
1995	2.2%	0.7%	48.8%	6.3%	1.8%	13.1%	7.4%	1.0%	18.8%
2000	3.1%	1.0%	38.0%	8.6%	2.3%	14.5%	7.5%	1.2%	23.9%
2005	4.8%	1.6%	30.2%	10.3%	2.9%	13.7%	7.9%	1.3%	27.3%
2010	5.8%	2.1%	23.5%	12.3%	3.3%	11.4%	9.9%	1.7%	30.1%
2013	6.2%	2.7%	21.1%	13.5%	3.8%	10.8%	9.4%	2.2%	30.2%

Hours worked

	Agriculture	Mining	Industry	Energy	Construction	Wholesale and retail trades	Transport and telecom.	Financial inter.	General services
1995	23.2%	0.4%	14.2%	0.6%	6.9%	18.1%	4.8%	5.3%	26.5%
2000	22.6%	0.4%	14.8%	0.5%	7.7%	18.0%	5.8%	6.4%	23.9%
2005	18.0%	0.4%	15.9%	0.5%	7.6%	20.3%	5.7%	7.1%	24.6%
2010	13.3%	0.5%	14.3%	0.4%	8.8%	24.1%	6.2%	8.0%	24.4%
2013	11.7%	0.5%	13.5%	0.4%	10.1%	24.2%	6.7%	8.3%	24.7%

Ad 3. Chile. The reallocation of resources (Total economy = 100)

Value Added

	Agriculture	Mining	Industry	Energy	Construction	Wholesale and retail trades	Transport and telecom.	Financial inter.	General services
1995	6.2%	6.9%	16.0%	2.4%	6.6%	14.6%	9.9%	24.6%	12.8%
2000	5.9%	5.6%	15.6%	2.5%	5.1%	13.1%	11.4%	24.9%	15.8%
2005	5.1%	13.3%	14.9%	2.6%	5.1%	11.1%	10.9%	22.6%	14.3%
2010	3.9%	17.1%	12.0%	3.3%	6.3%	10.7%	8.9%	22.3%	15.6%
2015	4.3%	9.6%	12.5%	3.1%	7.2%	12.0%	8.8%	25.0%	17.4%

Net Capital Stock

	Agriculture	Mining	Industry	Energy	Construction	Wholesale and retail trades	Transport and telecom.	Financial inter.	General services
1995	2.8%	11.7%	12.2%	14.7%	4.5%	8.2%	8.6%	2.7%	34.5%
2000	3.0%	10.5%	10.3%	14.3%	3.8%	9.3%	11.2%	3.7%	33.8%
2005	3.0%	11.1%	9.6%	13.7%	2.6%	8.4%	15.3%	4.9%	31.3%
2010	2.6%	12.9%	8.8%	13.5%	2.6%	7.3%	17.9%	6.3%	28.1%
2015	2.2%	17.2%	7.7%	12.7%	2.6%	7.4%	18.4%	6.9%	25.0%

Hours worked

	Agriculture	Mining	Industry	Energy	Construction	Wholesale and retail trades	Transport and telecom.	Financial inter.	General services
1995	16.0%	1.8%	16.0%	0.6%	7.8%	19.1%	8.1%	6.3%	24.2%
2000	14.4%	1.6%	14.0%	0.5%	7.2%	20.2%	8.5%	7.8%	25.9%
2005	13.3%	1.6%	13.1%	0.4%	8.4%	20.5%	8.7%	9.0%	24.9%
2010	10.8%	3.0%	11.7%	0.9%	8.1%	24.8%	8.4%	7.6%	24.8%
2015	9.2%	2.9%	10.9%	0.8%	8.7%	24.4%	8.0%	8.2%	26.9%

Ad 3. Colombia. The reallocation of resources (Total economy = 100)

Value Added

	Agriculture	Mining	Industry	Energy	Construction	Wholesale and retail trades	Transport and telecom.	Financial inter.	General services
1995	8.7%	5.0%	14.1%	2.6%	7.8%	14.7%	5.7%	25.9%	15.6%
2000	8.9%	6.4%	15.0%	3.5%	4.5%	13.9%	6.8%	22.2%	18.7%
2005	8.4%	6.9%	15.4%	4.4%	6.1%	13.0%	7.5%	20.9%	17.4%
2010	7.1%	9.2%	13.9%	3.9%	7.9%	12.7%	6.9%	21.0%	17.3%
2014	6.2%	9.2%	12.5%	3.6%	10.4%	12.8%	6.8%	20.6%	17.9%

Net Capital Stock

	Agriculture	Mining	Industry	Energy	Construction	Wholesale and retail trades	Transport and telecom.	Financial inter.	General services
1995	2.9%	12.6%	13.2%	21.1%	1.2%	1.8%	5.7%	1.4%	20.0%
2000	2.2%	8.5%	12.2%	20.4%	1.1%	1.8%	6.0%	1.3%	19.0%
2005	1.8%	6.1%	11.2%	18.6%	1.0%	2.0%	6.7%	1.2%	17.5%
2010	1.6%	5.3%	10.4%	15.4%	1.0%	2.5%	7.9%	1.0%	15.1%
2014	1.4%	5.5%	9.8%	14.1%	1.0%	2.4%	7.9%	0.9%	12.9%

Hours worked

	Agriculture	Mining	Industry	Energy	Construction	Wholesale and retail trades	Transport and telecom.	Financial inter.	General services
1995	25.9%	0.8%	13.2%	0.7%	6.2%	22.3%	5.5%	3.6%	21.8%
2000	22.1%	0.6%	13.3%	0.6%	4.3%	23.3%	6.1%	4.3%	25.4%
2005	19.5%	1.1%	13.5%	0.5%	5.0%	28.6%	7.5%	5.0%	19.3%
2010	17.1%	1.3%	13.1%	0.5%	6.1%	30.3%	8.5%	5.8%	17.2%
2014	16.8%	1.4%	13.1%	0.7%	7.1%	31.1%	9.0%	4.8%	16.0%

Ad 3. Mexico. The reallocation of resources (Total economy = 100)

Value Added

	Agriculture	Mining	Industry	Energy	Construction	Wholesale and retail trades	Transport and telecom.	Financial inter.	General services
1995	4.7%	6.5%	20.0%	1.6%	6.1%	17.9%	7.5%	23.8%	12.0%
2000	3.6%	6.8%	20.1%	1.8%	7.7%	18.5%	8.6%	21.1%	11.7%
2005	3.2%	7.8%	17.3%	2.2%	8.1%	17.6%	8.6%	22.4%	12.8%
2010	3.3%	7.7%	17.3%	2.1%	8.2%	17.1%	9.0%	22.0%	13.4%
2015	3.3%	4.4%	18.8%	1.9%	7.7%	19.8%	8.6%	21.5%	13.9%

Net Capital Stock

	Agriculture	Mining	Industry	Energy	Construction	Wholesale and retail trades	Transport and telecom.	Financial inter.	General services
1995	5.3%	7.5%	8.8%	2.1%	0.4%	5.5%	2.9%	53.1%	14.4%
2000	5.0%	7.0%	10.1%	2.1%	0.5%	5.9%	3.1%	52.2%	14.0%
2005	4.3%	7.3%	10.4%	2.2%	0.6%	7.0%	3.1%	51.9%	13.3%
2010	3.6%	7.6%	10.4%	2.2%	0.5%	7.8%	3.1%	51.1%	13.8%
2015	2.8%	6.9%	12.3%	1.9%	0.3%	7.6%	4.5%	49.9%	13.8%

Hours worked

	Agriculture	Mining	Industry	Energy	Construction	Wholesale and retail trades	Transport and telecom.	Financial inter.	General services
1995	20.0%	0.7%	15.4%	0.5%	10.5%	20.1%	7.4%	5.1%	20.4%
2000	18.1%	0.7%	15.8%	0.5%	14.5%	19.3%	7.7%	5.2%	18.2%
2005	17.1%	0.9%	14.6%	0.6%	13.9%	20.1%	7.4%	5.3%	20.0%
2010	17.3%	0.9%	12.7%	0.5%	14.7%	21.1%	7.2%	5.6%	19.9%
2015	17.2%	0.9%	12.9%	0.5%	13.6%	21.8%	7.1%	5.8%	20.3%

Aggregate and Industry TPF growth

Top down measure of aggregate TFP growth:

$$\mu := \hat{V} - \alpha\hat{K} - (1-\alpha)\hat{L} \qquad V: \text{real value added (GDP)};\ \mu: \text{TFP growth}$$

Bottom up measure of aggregate TFP growth is

a Domar-weighted *sum* (not average) of *industry* TFP growth rates:

$$\mu = \sum_{i=1}^{N} d_i \mu_i^{GO}$$

where $d_i := \left[\frac{GO_i}{GDP}\right]$, the Domar weights

and $$\mu_i^{GO} := \hat{Y}_i - \sum_{k=1}^{C} \alpha_{ik}\hat{K}_{ik} - \sum_{l=1}^{D} \beta_{il}\hat{L}_{il} - \sum_{j=1}^{N} m_{ij}\hat{M}_{ij}$$

Simple algebra shows that top down and bottom up measures are identically equal.

Domar (EJ, 1961); Hulten, RES, 1978; Jorgenson et al. (1987); Gabaix, Econometrica, 2011.

Aggregate and Industry TPF growth

Alternatively, we can use the value added concept of TFP growth:

$$\mu_i^{VA} := \hat{V}_i - \sum_{k=1}^{C} \alpha_{ik}^{VA} \hat{K}_{ik} - \sum_{l=1}^{D} \beta_{il}^{VA} \hat{L}_{il}$$

Simple algebra shows that:

$$\mu_i^{VA} = \left[\frac{GO_i}{VA_i} \right] \mu_i^{GO}$$

Hence we get the alternative aggregation scheme:

$$\mu = \sum_{i=1}^{N} v_i \mu_i^{VA} \qquad v_i : \text{value added share of ith industry in GDP}$$

Implications of Domar aggregation

$$\mu = \sum_{i=1}^{N} d_i \mu_i^{GO}$$

1. The Domar weights do not sum to 1 (generally the sum is between 2 and 3).
2. One Domar weight can increase without any other weight necessarily decreasing.
3. For given TFP growth rates, a rise in the Domar weight for the ith industry will raise the aggregate TFP growth rate, *provided TFP growth in the ith industry is positive.*
4. A shift in resources from high TFP growth to low (but positive) TFP growth industries can *raise*, not lower, the aggregate TFP growth rate.

Ad 5. Shifts in the structure of output and demand. The effect of structural change on TFP. Change in Domar Weights between first year and last year

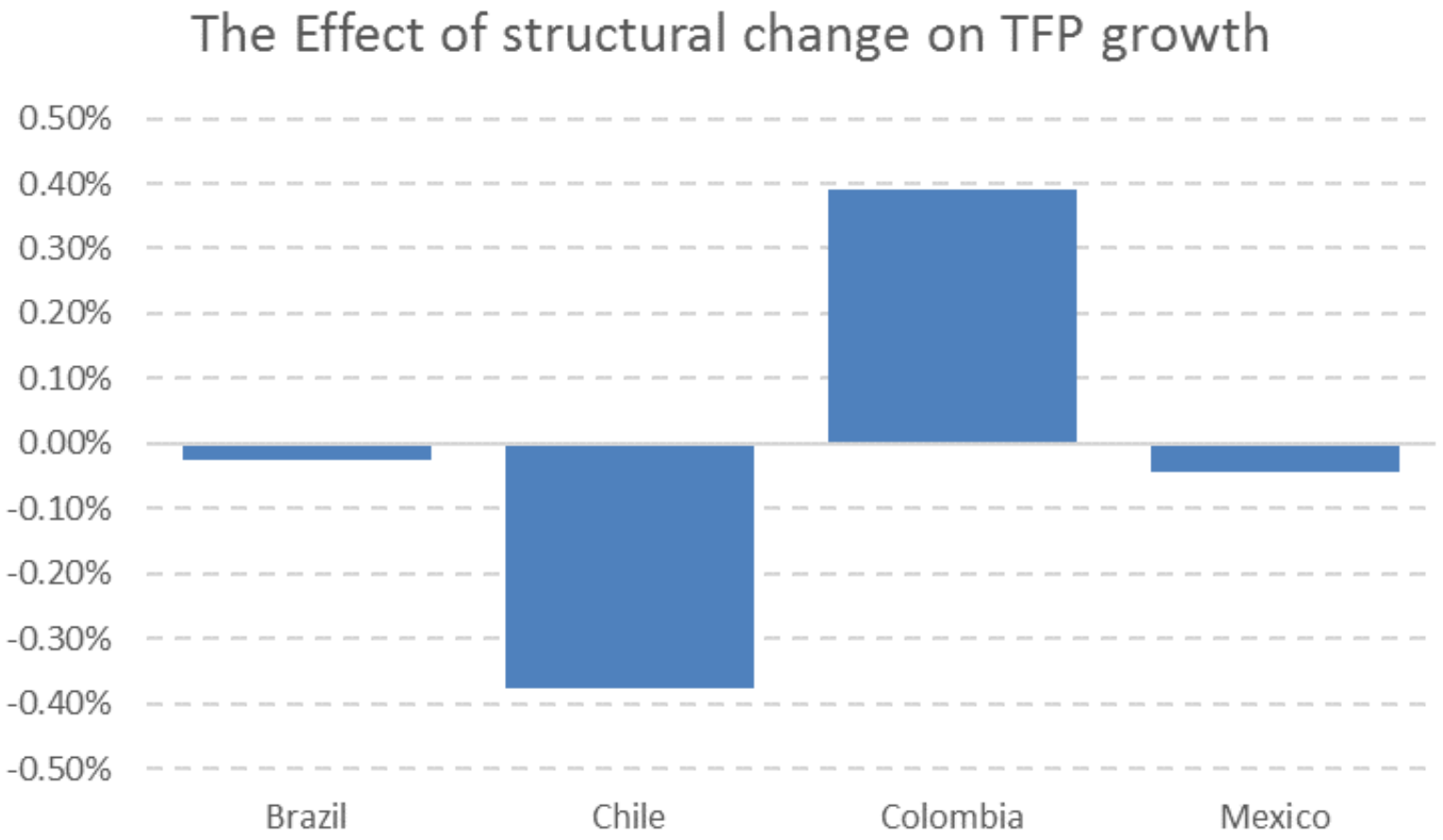
Now calculate what TFP growth in the economy would have been if the Domar weights had been constant at

-(a) those of the *beginning* of the sample period *or*

-(b) those of the *end* of the sample period.

The difference [(b) minus (a)] is the effect of structural change.

Ad 5. Shifts in the structure of output and demand. The effect of structural change on TFP. Change in Domar Weights between first year and last year



Source: LAKLEMS database

Ad 5. Shifts in the structure of output and demand. The effect of structural change on TFP. Change in Domar Weights between first year and last year

The effect of structural change is predominantly negative. Only one out of the four countries show a positive effect: Colombia. Arithmetically, the reason is clear: in most countries resources have been shifting to the mining but in this sector TFP growth is almost invariably estimated as negative (see column 1).

	Net Goods production	Consumer Services	Producer Services	Total
Brazil	-0.13%	-0.02%	0.13%	-0.02%
Chile	-0.30%	-0.01%	-0.06%	-0.38%
Colombia	0.26%	0.05%	0.08%	0.39%
Mexico	-0.02%	0.00%	-0.03%	-0.05%

CHILE. AGGREGATE REALLOCATION EFFECTS IN THE ECONOMY

(Domar-weighted growth in percent)

	1997-2002	2003-2008	2009-2015	1997-2015
Agregate TFP Growth	**-0.06%**	**-0.12%**	**-0.42%**	**-0.25%**
Domar- weighted TFP	***-2.09%***	***-1.89%***	***-1.49%***	***-1.81%***
Agriculture	-0.02%	0.11%	0.05%	0.05%
Mining	0.00%	-0.91%	-1.39%	-0.80%
Industry	-0.08%	0.00%	-0.14%	-0.08%
Energy	-0.04%	-0.33%	0.06%	-0.09%
Construction	-0.07%	0.07%	-0.01%	0.00%
Wholesale and retail trade	-0.32%	0.45%	0.41%	0.19%
Transport and telecom.	-0.09%	-0.25%	0.13%	-0.06%
Financial inter.	-1.39%	-0.94%	-0.47%	-0.91%
General services	-0.08%	-0.09%	-0.13%	-0.10%
Reallocation of Capital Input	***1.76%***	***1.59%***	***0.82%***	***1.30%***
Reallocation of Labor Input	***0.28%***	***0.17%***	***0.26%***	***0.26%***

Source: LAKLEMS database

BRAZIL. AGGREGATE REALLOCATION EFFECTS IN THE ECONOMY

(Domar-weighted growth in percent)

	1996-2002	2003-2008	2009-2013	1996-2013
Agregate TFP Growth	**-1.00%**	**0.07%**	**-0.61%**	**-0.54%**
Domar- weighted TFP	***-2.0%***	***-0.6%***	***-2.6%***	-1.7%
Agriculture	0.0%	-0.1%	-0.1%	-0.1%
Mining	0.0%	-0.1%	-0.4%	-0.2%
Industry	-0.3%	0.2%	0.1%	-0.1%
Energy	-0.1%	0.0%	-0.1%	-0.1%
Construction	-0.2%	-0.2%	0.0%	-0.2%
Wholesale and retail	-0.3%	0.3%	-0.2%	0.0%
Transport and telecor	0.0%	-0.1%	-0.1%	-0.1%
Financial inter.	-0.6%	0.0%	-1.2%	-0.5%
General services	-0.5%	-0.6%	-0.6%	-0.5%
Reallocation of Capital Input	***0.7%***	***0.5%***	***2.0%***	1.0%
Reallocation of Labor Input	***0.3%***	***0.2%***	***0.0%***	0.2%

Source: LAKLEMS database

COLOMBIA. AGGREGATE REALLOCATION EFFECTS IN THE ECONOMY

(Domar-weighted growth in percent)

	1996-2002	2003-2008	2009-2014	1996-2014
Agregate TFP Growth	**-3.5%**	**0.0%**	**-0.8%**	**-1.6%**
Domar- weighted TFP	***-5.4%***	***2.1%***	***-6.4%***	-3.3%
Agriculture	-0.5%	0.2%	-0.2%	-0.2%
Mining	0.2%	0.2%	0.2%	0.2%
Industry	-0.5%	0.6%	-0.7%	-0.2%
Energy	0.0%	0.2%	-0.1%	0.0%
Construction	-0.4%	0.4%	-0.3%	-0.1%
Wholesale and reta	-1.9%	0.5%	-2.0%	-1.2%
Transport and telec	-0.9%	0.1%	-0.3%	-0.4%
Financial inter.	-2.2%	-0.3%	0.3%	-0.8%
General services	0.8%	0.3%	-3.2%	-0.6%
Reallocation of Capital Input	***0.6%***	***0.5%***	***0.6%***	***0.5%***
Reallocation of Labor Input	***1.3%***	***-2.6%***	***4.9%***	***1.2%***

Source: LAKLEMS database

MEXICO. AGGREGATE REALLOCATION EFFECTS IN THE ECONOMY

(Domar-weighted growth in percent)

	1996-2002	2003-2008	2009-2015	1996-2015
Agregate TFP Growth	**-1.30%**	**-0.88%**	**-0.40%**	**-0.86%**
Domar- weighted TFP	***-1.32%***	***-0.81%***	***1.32%***	***-0.24%***
Agriculture	-0.06%	0.09%	0.17%	0.07%
Mining	-0.04%	-0.44%	-0.01%	-0.15%
Industry	-0.29%	-0.42%	0.02%	-0.22%
Energy	0.03%	0.08%	0.25%	0.13%
Construction	-0.25%	-0.08%	0.29%	-0.01%
Wholesale and retai	-0.25%	-0.88%	0.43%	-0.20%
Transport and telecc	-0.08%	0.13%	-0.31%	-0.10%
Financial inter.	-0.17%	0.62%	0.54%	0.31%
General services	-0.20%	0.10%	-0.06%	-0.06%
Reallocation of Capital Input	***-0.02%***	***0.02%***	***-1.84%***	***-0.64%***
Reallocation of Labor Input	***0.04%***	***-0.09%***	***0.11%***	***0.03%***

Source: LAKLEMS database

CONCLUSION

Hay indicios que América Latina tiene problemas de incorporar, aunque sea copiado, progreso técnico. (1)

Que conclusión con respecto a learning effects etc. (2)

En América Latina hay una tendencia clara de alocar recursos hacia industrias con bajo productividad (aunque pueden ser industrias con alta rentabilidad como consecuencia de efectos precios, ej. Minería). (3)

Errores de medición son una realidad en América Latina. (4)

Conclusión con respecto a cambio en la estructura de producción (5):

En Chile muy claro, realocación de capital es horrendo.

Brasil, cambios Domar son el factor explicativo?

Colombia: también Domar salvo 2003-2008 que pasó con factor trabajo?

México: combinación de alocación de capital y efectos Domar.

What happens with total factor productivity in Latin America?

Thank you