

Online Annex 2. Fostering Growth through Business Dynamism¹

This Annex presents technical details and background material for the analysis in Chapter 2 “Fostering Growth through Business Dynamism” of the October 2025 Regional Economic Outlook for the Western Hemisphere.

2.1. Sectoral Analysis

This section provides the technical details for Chapter 2, Figure 2.1. The aggregate growth accounting approach follows the standard two-factor production function commonly used in literature.

Data

Sources and Definitions

Country Aggregates. For the growth accounting exercise at the aggregate level, the following series from the Penn World Tables (PWT) (Feenstra and others 2015) are used:

- Real GDP Y_t : “rgdpna” (real GDP in national prices, 2017 base)
- Capital Inputs K_t : “rkna” (capital services in national prices, 2017 base)
- Labor Inputs L_t : “emp” (employment) * “avh” (average hours) * “hc” (human capital index)
- Labor share α_t : “labsh” (labor share)

Country Sectoral Composition. Sectoral composition is derived from input series published in the KLEMS accounts, covering (K-capital, L-labor, E-energy, M-materials, and S-purchased services).

LA KLEMS (1990–2018) for Chile, Colombia, Mexico, and Peru (Gu and Hofman 2021):

- Value added $\tilde{Y}_{it}$: “VA” (the gross value added at current basic prices)
- Labor remuneration $C_{it}^L = W_t \cdot L_{it}$: “LAB” (labor income in value added at current basic prices)
- Capital remuneration $C_{it}^K = R_t \cdot K_{it}$: “CAP” (capital income in value added at current basic prices calculated as the difference between valued added and labor income)

EU KLEMS (1995–2021) for Austria, Belgium, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Italy, Japan, Latvia, Lithuania, Luxembourg, Netherlands, Slovak Republic, Slovenia, Spain, Sweden, United Kingdom, and United States (Bontadini and others 2023):

- Value added $\tilde{Y}_{it}$: “VA_CP” (the gross value added at current basic prices – equivalent to “VA” in LA KLEMS)
- Capital remuneration $C_{it}^K = R_t \cdot K_{it}$: “CAP” (capital income in value added at current basic prices calculated as the difference between value added and labor income)
- Labor remuneration $C_{it}^L = W_t \cdot L_{it}$: “LAB” (labor income in value added is obtained as the sum of compensation of employees and an imputation for the compensation of self-employed --equivalent to “LAB” in LA KLEMS)

Brazil. As the LA KLEMS dataset does not include Brazil, a series for 2000–2020 was constructed using Brazil’s Supply-Use Tables (SUT) from the Brazilian Institute of Geography and Statistics (IBGE). This followed the approach in REO 2024 Online Annex 4, developed by the IMF Statistics Department, which combined detailed investment product data from the national accounts with the annual sectoral figures from SUT to measure investment by economic activity.

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In the IBGE SUT tables, both “Valor adicionado bruto (PIB)” (value added) and “Remunerações” (labor remunerations) are reported. The analysis focuses on the section of the table corresponding to the “Consumo intermediário das atividades” (intermediate consumption by economic activity) across sectors. Capital remuneration is computed as the residual—that is, value added minus labor remuneration. To align and harmonize the data with the LA KLEMS framework, the industry classification from the SUT was further mapped to the corresponding LA KLEMS codes (Online Annex Table 2.1).

Online Annex Table 2.1. Correspondence between LA KLEMS and IBGE’s SUT Industry Classification

LA KLEMS Industry classification ISIC Rev. 3	Description	Supply-Use Tables (SUT) from the Brazilian Institute of Geography and Statistics (IBGE) Sectoral classification correspondence
AtB	Agriculture, hunting, forestry, and fishing	Agropecuária
C	Mining and extraction	Indústrias extrativas
D	Manufacturing	Indústrias de transformação
E	Electricity, gas, and water	Eletricidade, gás, água, esgoto e gestão de resíduos
F	Construction	Construção
GtH	Retail, hotels, and restaurants	Comércio
I	Transportation, storage, and communications	Transporte, armazenagem e correio; Informação e comunicação
JtK	Finance, insurance, real estate, and business services	Atividades financeiras, de seguros e serviços relacionados; Atividades imobiliárias
LtQ	Social community, personal services, and others	Outras atividades de serviços; Administração, defesa, saúde e educação públicas, e seguridade social
TOT	Total industries	

Sources: LA KLEMS database (Gu and Hofman 2021); national authorities; and IMF staff.

Chile. To ensure Chile’s industry panel is complete and consistent through 2018, two main gaps in the LA KLEMS dataset were addressed:

- **Filling in missing “Social Community and Personal Services” (LtQ) sector:** The labor and capital remunerations for LtQ sector were not reported in the original LA KLEMS for the period prior to 2018. To reconstruct the series, Chile’s national SUT for 2014–18, which report both value added and labor remuneration by industry, were used. The five-year SUT data provided the basis for calculating the sector’s average labor share (about 78.9 percent), which was then applied to the LtQ value added series from LA KLEMS for each year during 1990–2017. The imputation yields a coherent LtQ remuneration series consistent with the rest of the dataset, with capital remunerations subsequently derived as value added minus labor remunerations.
- **Extension of all sectors through 2018:** The LA KLEMS dataset for Chile ends in 2017 with no observations for 2018. The full industry panel was extended through 2018 by: (i) applying 2018 growth rates in value added by industry to 2017 values from SUT, and (ii) recomputing the labor and capital remunerations for 2018 using the sector’s five-year average labor share, ensuring that their sum matched the estimated value added exactly.

Correspondence between LA KLEMS and EU KLEMS

In the following exercise EU KLEMS sectoral definitions are aligned with the LA KLEMS framework. This methodology adopts the International Standard Industrial Classification (ISIC Rev. 3). The EU KLEMS dataset employs the NACE Rev. 2 industry classification. To harmonize these data with the LA KLEMS industry definitions, the following correspondence table is applied (Online Annex Table 2.2):

To complete each country-industry series, interior gaps were filled by linear interpolation and endpoints were extrapolated linearly within each country-industry panel. Endpoint projections use the boundary slope, that is, the average annual change between the two nearest observed years on the relevant edge.

Online Annex Table 2.2. Correspondence between LA KLEMS and EU KLEMS Industry Codes

LA KLEMS Industry classification ISIC Rev. 3	Description	EU KLEMS Correspondence NACE Rev. 2
AtB	Agriculture, hunting, forestry, and fishing	A
C	Mining and extraction	B
D	Manufacturing	C
E	Electricity, gas, and water	D, E
F	Construction	F
GtH	Retail, hotels, and restaurants	G, I
I	Transportation, storage, and communications	H, J
JtK	Finance, insurance, real estate, and business services	K, L, M, N
LtQ	Social community, personal services, and others	O, P, Q, R, S, T, U
TOT	Total industries	

Sources: EU KLEMS database (Bontadini and others 2023); LA KLEMS database (Gu and Hofman 2021); and IMF staff.

Harmonizing Country Aggregates with Sectoral Composition

The combined KLEMS data was further adjusted along two dimensions. First, aggregate output, labor, and capital levels from the PWT were distributed across industries based on their respective shares in value added, labor remuneration, and capital remuneration in the KLEMS data. Second, labor and capital compensation in the KLEMS were scaled to match the PWT values before calculating industry-level factor shares.

For the first adjustment, quality-adjusted inputs by industry were calculated as each industry's share in total factor remuneration. Labor inputs were derived as an industry's share of total labor remuneration times aggregate labor supply from the PWT. Capital inputs were adjusted in the same way using capital remuneration and aggregate capital supply. On the output side, industry-level value added was rescaled so that its sum across industries matches PWT real GDP:²

$$L_{it} = \frac{C_{it}^L}{\sum_j C_{jt}^L} \cdot L_t, \quad K_{it} = \frac{C_{it}^K}{\sum_j C_{jt}^K} \cdot K_t, \quad \text{and} \quad Y_{it} = \frac{\tilde{Y}_{it}}{\sum_j \tilde{Y}_{jt}} \cdot Y_t.$$

For the second adjustment, labor and capital remuneration in the KLEMS accounts were scaled such that their total equals the implied values in the PWT, i.e., $\alpha_t \cdot Y_t$ and $(1 - \alpha_t) \cdot Y_t$, before calculating the industry-level factor shares:

$$\alpha_{it} = \frac{C_{it}^L}{Y_{it}} \cdot \frac{\alpha_t \cdot Y_t}{\sum_j C_{jt}^L} \quad \text{and} \quad \beta_{it} = \frac{C_{it}^K}{Y_{it}} \cdot \frac{(1 - \alpha_t) \cdot Y_t}{\sum_j C_{jt}^K}.$$

The resulting data provides a comprehensive dataset for growth accounting with consistent measures at the national and sector levels.

Growth Accounting

The growth accounting exercise in Chapter 2, Figure 2.1, panel 2, decomposes year-on-year output growth (from year t to $t + 1$) in the region into the contributions of productivity, capital, and labor using the familiar approach:³

$$\Delta\% A_{t+1} = \Delta\% Y_{t+1} - (\alpha_t \cdot \Delta\% L_{t+1} + (1 - \alpha_t) \cdot \Delta\% K_{t+1})$$

² This approach can be motivated by the assumption of competitive factor markets such that the quality-adjusted factor price is equalized across industries. The resulting measures of inputs are then quality-adjusted input levels reflecting, e.g., differences in human capital per worker across industries or the quality or utilization rate of machinery.

³ With variable factor shares, the TFP term reflects both changes in A_t and the direct impact of changing factor shares. Our approach is consistent with the PWT growth-accounting convention of using capital services as capital input and quality-adjusted hours as labor input, with time varying factor income shares to weight input growth, and TFP growth calculated as the residual.

Annual growth rates were averaged across years using the arithmetic mean. For regions, annual PPP-weighted averages were calculated first, then averaged across years.

Methodology and Implementation of Counterfactual Analysis

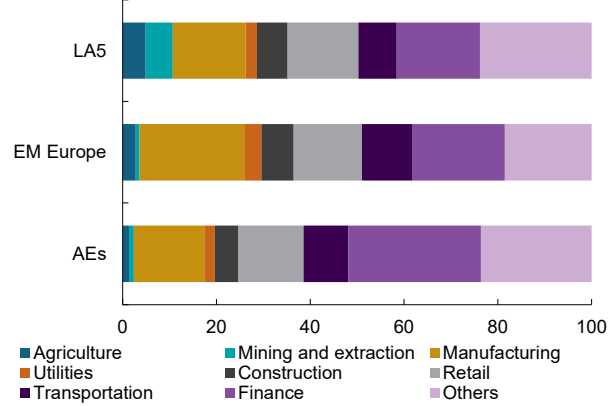
For Chapter 2, Figure 2.1, panel 3, adjustments for resource intensive sectors were considered. These adjustments relied on the insight that the aggregate productivity growth rate is the value-added weighted average sectoral productivity growth rate:

$$\Delta\% A_{t+1} = \sum_i \omega_{it} \cdot \Delta\% A_{it+1} \quad \text{with} \quad \omega_{it} = \frac{Y_{it}}{Y_t}.$$

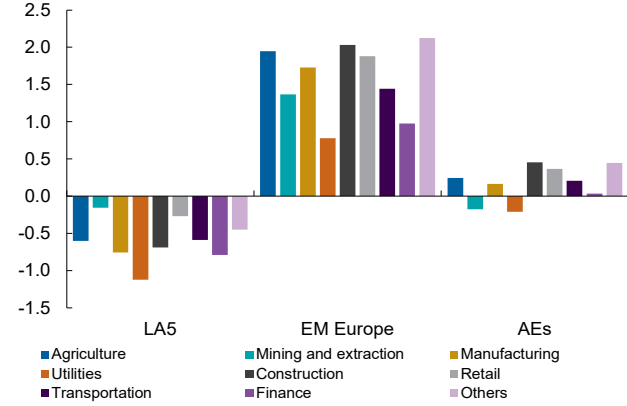
Using this formula, alternative growth rates were constructed by either changing the value-added weights or the industry-level growth rates.

Online Annex Figure 2.1. GDP Growth and Sectors, 2000–18

1. Sectoral Composition of GDP
(Percent; annual averages)



2. TFP Contributions to Real GDP Growth by Sector
(Percent; annual averages)



Sources: IMF, World Economic Outlook database; EU KLEMS database (Bontadini and others 2023); LA KLEMS database (Gu and Hofman 2021); national authorities; Penn World Table 10.01 database; and IMF staff calculations.

Note: Aggregates are purchasing-power-parity GDP-weighted averages. Regional groupings use 2005 WEO classification. Countries are abbreviated using International Organization for Standardization (ISO) country codes. AE = advanced economies (AUT, BEL, DEU, DNK, FIN, FRA, DEU, GRC, ITA, JPN, LUX, NLD, NOR, ESP, SWE, GBR, USA); EM = emerging markets; EM Europe = CZE, EST, LTU, LVA, SVK, SVN, POL, ROU; LA5 = Latin America 5 (BRA, CHL, COL, MEX, PER). The charts exclude some countries (NOR, POL, ROU) due to data availability. No data are available for 2019. The following industries are abbreviated: Agriculture=agriculture, hunting, forestry, and fishing; Finance=finance, insurance, real estate, and business services; Other services = social, community, and personal services; TFP = total factor productivity.

TFP Index

Following the PWT approach, the country TFP index in Chapter 2, Figure 2.1, panel 1, is constructed by cumulating growth rates over time. The growth rate is calculated as

$$\Delta \ln A_{t+1} = \Delta \ln Y_{t+1} - (\alpha_t \cdot \Delta \ln L_{t+1} + \beta_t \cdot \Delta \ln K_{t+1}).$$

Next, a normalized index in levels is created starting at t_0 as

$$\tilde{A}_{t_0+\delta} = \exp \left(\sum_{s=1, \dots, \delta} \Delta \ln A_{t_0+s} \right).$$

2.2. Firm-Level Data: Sources, Definitions, and Preparation for Empirical Analysis

Data Sources

Two separate data sources are used: the Orbis Enterprise Survey (Orbis) and the World Bank Enterprise Survey (WBES). The Orbis database was prepared as in Diez and others (2021). The WBES data are retrieved directly from the World Bank website. All the surveys available from 2005 onwards for countries in our Orbis database are used to maintain comparability with Orbis, values are deflated using the same deflators applied for the Orbis database.

Variable Definitions

For the purposes of analysis firms are indexed by i or j , sectors by $s \in S$, countries by m or n and time by t . The set of firms in sector s at time t is denoted by I_{st} . Finally, whenever a sector related to a firm is referenced, it is indexed by $s(i)$.

For Orbis, the following definitions are used:

- Revenue Y_{it} : “OPER_TURN_ppi” (PPI⁴ deflated operational turnover)
- Cost of goods sold⁵ V_{it} : “COSTGOOD_ppi” (PPI deflated costs related to the production of goods, including production and services costs plus associated depreciations)
 - Cost of goods sold is proxied by “MATERIAL_ppi” (PPI deflated cost of materials, including raw and finished goods, excluding services) plus “wagebill_ppi” (PPI deflated cost of employees, including wages, pensions, and other labor costs) when “COSTGOOD_ppi” is missing.
- Capital K_{it} : “FIXEDASSETS_piwdi” (PIWDI⁶ deflated tangible fixed assets after depreciation, including buildings, machinery, and equipment; intangible assets and long-term financial investments are excluded).

For WBES, the following variables are used.

- Revenue: “d2” (total annual sales)
- Sample weights: “wt” (survey sampling weights)

Sample Selection

The analysis focuses on the manufacturing and service sectors, while excluding mining, utilities, transportation and storage, finance and real estate, public, and education and healthcare sectors. These sectors are excluded because their assets are often used as inventory or intangible stocks, which is fundamentally different from manufacturing and services. In these sectors, their inputs and outputs cannot be mapped consistently into the production function used in this analysis nor were they aligned with the available data.

Observation Weights

To improve representativeness of the Orbis samples, sample weights are constructed to align the firm-size distribution (as proxied for with sales) with WBES.

Approach. The objective is to create observation weights for Orbis that allow meaningful cross-country comparisons, ensuring that results are not driven by differences in sampling procedures. A key issue for this approach is to obtain an insight into implicit sampling weights for Orbis for which the WBES is used. Firms are

⁴ PPI denotes that the variable has been deflated using industry or country-level price indices, expressed in 2015 constant USD.

⁵ COGS variable is not consistently populated across countries. For example, in the sample for France, cost of goods sold is essentially unpopulated. Following Diez and others (2021), a proxy COGS variable is created as the sum of materials and the wage bill, which is close to the technical definition of COGS.

⁶ PIWDI indicates deflation with World Bank World Development Indicators (WDI) country-level investment deflators, expressed in 2015 constant USD.

categorized into size classes based on their sales, and the frequency for each size class is calculated for both samples, WBES and Orbis. The ratio of the frequencies across samples is then the relative sampling frequency.

Mathematical details. Denote a particular size class by $c \in C$, country by m , year by t , and the share of firms in each size class and sample (for a given year) by

$$\omega_{c,m,t,ORBIS} = \frac{\#Firms\ in\ ORBIS\ in\ size\ class\ c}{\#Firms\ in\ ORBIS} \quad and \quad \omega_{c,m,t,WBES} = \frac{\#Firms\ in\ WBES\ in\ size\ class\ c}{\#Firms\ in\ WBES}$$

The relative sampling frequency is then given by

$$\tilde{\omega}_{c,m,t} = \frac{\omega_{c,m,t,ORBIS}}{\omega_{c,m,t,WBES}}.$$

For example, a value of 3 implies that the size class is three times as likely to be sampled in Orbis as in WBES. To recover an WBES-like distribution, one would need to apply the inverse relative sampling frequency to Orbis data. Online Annex Figure 2.2. provides an example for Mexico.

For countries without WBES sample but sufficiently high coverage of the respective economy in Orbis, the observation weight is set to 1. This adjustment applies exclusively to samples from advanced economies.

Production Function Estimation

Throughout, a Cobb-Douglas production functions with sector-specific elasticities for variable costs and capital, β_s^V and β_s^K , is assumed:

$$Y_{it} = A_{it} \cdot V_{it}^{\beta_{s(i)}^V} \cdot K_{it}^{\beta_{s(i)}^K}$$

The production function elasticities are estimated in two alternative approaches. **The first approach** follows Hsieh and Klenow (2009) and uses cost shares, such that

$$\beta_s^V = \frac{\sum_t \sum_{i \in I_{st}} V_{it}}{\sum_t \sum_{i \in I_{st}} V_{it} + \sum_t \sum_{i \in I_{st}} R_t \cdot K_{it}} \quad and \quad \beta_s^K = 1 - \beta_s^V.$$

Capital costs are estimated using an interest rate of 10 percent as in Hsieh and Klenow (2009).

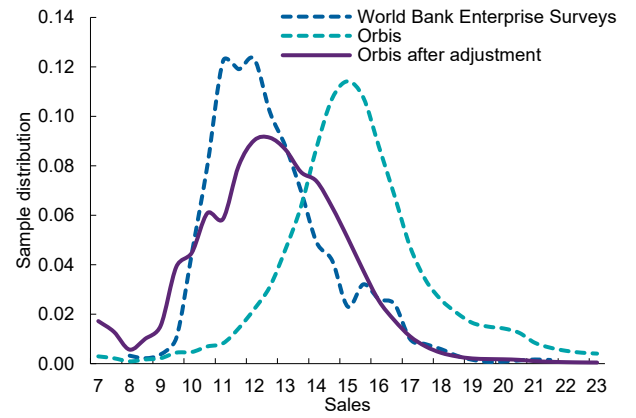
The second approach follows Diez and others (2021), who implement the approach proposed in Akerberg, Caves, and Frazer (2015) (ACL) for Orbis. Elasticities are estimated at the sectoral level (2-digit NACE) by region. The estimation step is performed using Diez and others (2021) replication code, which implements the GMM estimator for the elasticities suggested by ACL.

The production function is assumed to be Cobb-Douglas production function with cost of goods sold V_{it} as variable input and capital K_{it} as a state variable:

$$\ln \hat{A}_{it} = \ln Q_{it} - \beta_{s(i)}^V \cdot \ln V_{it} - \beta_{s(i)}^K \cdot \ln K_{it},$$

Online Annex Figure 2.2. Mexico: Comparison of Orbis and World Bank Enterprise Surveys Distribution

(X-axis: 2015 constant USD in logs; Y-axis: fraction)



Sources: IMF, World Economic Outlook database; Orbis; World Bank Enterprise Surveys; and IMF staff calculations.

Where it is assumed that output equals deflated revenue ($Q_{it} = Y_{it}$). The factor elasticities $\{\beta_s^K, \beta_s^V\}$ are then estimated via GMM assuming a stationary Markov process for productivity. Elasticities are estimated separately for each 2-digit industry and region.

2.3. Measuring Resource Misallocation

Methodology

Hsieh and Klenow (2009) show that resource misallocation can be measured using firm-level data on revenue and inputs.⁷ In their framework, which assumes labor and capital as input factors, the firm-level summary statistic $TFPR_{it}$ captures frictions affecting the allocation of both inputs. It is calculated as

$$TFPR_{it} = \frac{Y_{it}}{(W_{it} \cdot L_{it})^{\beta_{s(i)}^L} \cdot K_{it}^{\beta_{s(i)}^K}}.$$

They further show within their framework that one can recover physical productivity (A_{it})

$$A_{it} = \kappa_{s(i)t} \cdot \frac{Y_{it}^{\frac{\sigma}{\sigma-1}}}{(W_{it} \cdot L_{it})^{\beta_{s(i)}^L} \cdot K_{it}^{\beta_{s(i)}^K}}.$$

The aggregate impact of frictions is then given by⁸

$$\Lambda_t = \prod_{s \in S} \Lambda_{st}^{\theta_s} \quad \text{where} \quad \Lambda_{st} = \sum_{i \in F_{st}} \frac{\omega_{it} \cdot A_{it}^{\sigma-1}}{\sum_{j \in I_{st}} \omega_{jt} \cdot A_{jt}^{\sigma-1}} \cdot \left(\frac{TFPR_{ft}}{TFPR_{st}} \right)^{-\sigma} \quad \text{and} \quad TFPR_{st} = \left(\sum_{i \in F_{st}} \frac{\omega_{it} \cdot A_{it}^{\sigma-1}}{\sum_{j \in I_{st}} \omega_{jt} \cdot A_{jt}^{\sigma-1}} \cdot TFPR_{it}^{1-\sigma} \right)^{\frac{1}{1-\sigma}}.$$

Note that Hsieh and Klenow (2009) do not use observation weights and, thus, set $\omega_{it} = 1$.

Implementation

The Hsieh and Klenow (2009) formula above is implemented using costs of goods sold and capital as production factors with factor elasticities estimated via cost shares. Sectors are defined by 2-digit NACE codes and sectoral Cobb-Douglas weights estimated using sales shares. The elasticity of substitution is set at $\sigma = 3$, which follows Hsieh and Klenow (2009) and is in line with average elasticities reported in Broda, Greenfield, and Weinstein (2017). The analysis applies observation weights constructed as described above. Estimated frictions and productivity values are winsorized at the 1 percent and 99 percent levels to control for outliers. Misallocation measures are estimated for each country-year and aggregated to country level using geometric averages. Regional values are calculated using the GDP-weighted geometric average.

⁷ Hsieh and Klenow (2009) used value added instead of revenue in their calculations. Hang and others (2020) note that using revenue is less prone to bias towards finding more misallocation, while Bils and others (2021) point out that dispersion in measured wedges tend to be smaller when using gross output, i.e., revenue, instead of value added.

⁸ This formula is equivalent to the one in Hsieh and Klenow (2009):

$$\Lambda_t = \prod_{s \in S} \left(\sum_{i \in I_{st}} \left(\omega_{it} \cdot \frac{A_{it}}{\bar{A}_{st}} \cdot \frac{\overline{TFPR}_{st}}{TFPR_{it}} \right)^{\sigma-1} \right)^{\frac{\theta_s}{\sigma-1}} \quad \text{with} \quad \bar{A}_{st} = \left(\sum_{i \in I_{st}} \omega_{it} \cdot A_{it}^{\sigma-1} \right)^{\frac{1}{\sigma-1}} \quad \text{and} \quad \overline{TFPR}_s = \sum_{i \in I_{st}} \frac{\omega_{it} \cdot Y_{it}}{\sum_{j \in I_s} \omega_{jt} \cdot Y_{jt}} \cdot TFPR_{it}.$$

2.4. Contributors to Growth

Methodology/Formulas

The TFP growth decomposition combines the approach from Melitz and Polanec (2015) with Griliches and Regev (1995).⁹ Both frameworks assume that TFP, A_t , can be expressed as the weighted average of firm-level productivity for the set of currently operating firms F_t :

$$A_t = \sum_{i \in F_t} \omega_{it} \cdot A_{it}$$

Melitz and Polanec (2015) then show that TFP growth between two periods t and $t + \Delta$ can be decomposed into the contribution of surviving firms $I_{t,t+\Delta}^S$, entering firms $I_{t,t+\Delta}^E$, and exiting firms $I_{t,t+\Delta}^X$:

$$\frac{A_{t+\Delta} - A_t}{A_t} = \Delta A_{t,t+\Delta}^S + \Delta A_{t,t+\Delta}^E + \Delta A_{t,t+\Delta}^X$$

The entry component compares the productivity of entering and surviving firms in the end period, while the exit component compares the productivity of exiting and surviving firms in the start period:

$$\begin{aligned} \Delta A_{t,t+\Delta}^E &= \omega_{t+\Delta,t,t+\Delta}^E \cdot \frac{A_{t+\Delta}}{A_t} \left[\sum_{I_{t,t+\Delta}^E} \omega_{it,t,t+\Delta}^E \cdot \frac{A_{it+\Delta}}{A_{t+\Delta}} - \sum_{I_{t,t+\Delta}^S} \omega_{it+\Delta,t,t+\Delta}^S \cdot \frac{A_{it+\Delta}}{A_{t+\Delta}} \right] \\ \Delta A_{t,t+\Delta}^X &= \omega_{t,t,t+\Delta}^X \cdot \left[\sum_{I_{t,t+\Delta}^S} \omega_{it,t,t+\Delta}^S \cdot \frac{A_{it}}{A_t} - \sum_{I_{t,t+\Delta}^X} \omega_{it,t,t+\Delta}^X \cdot \frac{A_{it}}{A_t} \right] \\ \text{where } \omega_{t,s,t+\Delta}^Z &= \sum_{i \in Z_{s,t+\Delta}} \omega_{it} \quad \text{and} \quad \omega_{it,s,t+\Delta}^Z \equiv \frac{\omega_{it}}{\omega_{t,s,t+\Delta}^Z} \quad \text{with } Z \in \{E, N, S\} \end{aligned}$$

Finally, Griliches and Regev (1995) show that the surviving firms' margin can be decomposed into an across-firm reallocation component and a within-firm productivity improvement term:

$$\Delta A_{t+1}^S = \underbrace{\sum_{i \in I_{t,t+1}^S} (\omega_{it+1}^S - \omega_{it}^S) \cdot \frac{\bar{A}_{it,t+1}}{A_t}}_{\text{Reallocation component}} + \underbrace{\sum_{i \in I_{t,t+1}^S} \left(\frac{A_{it+1}}{A_t} - \frac{A_{it}}{A_t} \right) \cdot \bar{\omega}_{it,t,t+1}^S}_{\text{Within-firm component}}$$

where $\bar{A}_{it,t+1} = \frac{1}{2} (A_{it} + A_{it+1})$ and $\bar{\omega}_{it,t,t+1}^S = \frac{1}{2} (\omega_{it+\Delta,t,t+\Delta}^S + \omega_{it,t,t+\Delta}^S)$.

Implementation

For the decomposition, estimates for firm-level productivity are scaled to match aggregate estimates of TFP from PWT. Productivity is constructed using the residual approach with production function elasticities estimated following Diez and others (2021). Following Fentanes and Levy (2024), resource inputs ($V_{it}^{\beta_{s(i)}^V} \cdot K_{it}^{\beta_{s(i)}^K}$) are used to construct firm weights, which are then further adjusted for the observations weights constructed from WBES. For entry and exit, a firm is considered exiting if it is not observed for at least three consecutive years and stops being active after the initial observation. A firm is considered entering if it appears at some point after the initial observation. Firms with missing observations in either year of interest are dropped from the sample.

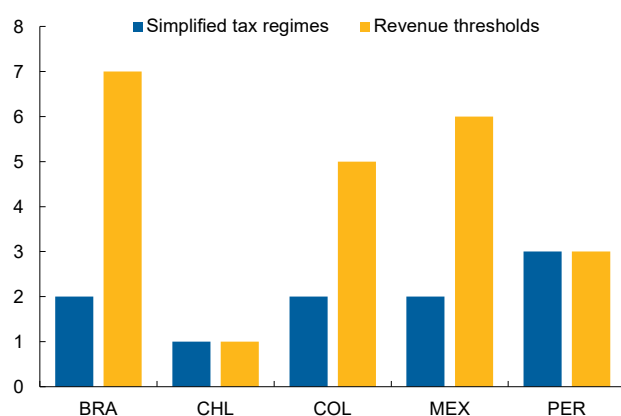
⁹ See also Amundsen and others (2025).

2.5. Size-dependent Policies

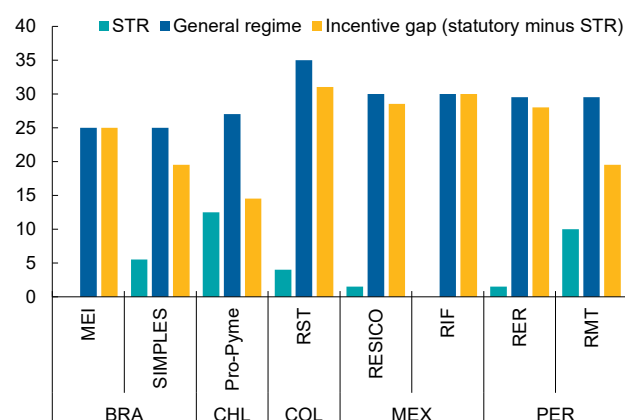
The tables and panels below provide further technical details to Chapter 2, Figure 2.4, panel 1, showing a taxonomy of simplified tax regimes (STRs) in selected LA countries. Several countries in the region have at least two types of STRs (Online Annex, 2.3, panel 1) with significant differences between the STR and corporate income tax (CIT) general tax regimes (Online Annex Figure 2.3, panel 2). Eligibility for lower CIT is typically determined by firm-level revenue thresholds and/or number of employees occupied in the firm. Firms just below the threshold benefit from low, flat rates, while crossing that threshold triggers a large, one-time boost in statutory tax rates (especially CIT) and/or more rigorous labor regulations. This abrupt change creates strong incentives for firms to deliberately limit their size in order to remain within the favorable tax bracket (Garicano and others 2016; Benedek and others 2017; Azuara and others 2019; Mas-Montserrat and others 2024). While STRs are generally intended to ease compliance costs for small firms, the presence of multiple and unaligned revenue thresholds across different tax instruments—including personal income tax (PIT), CIT, social security contributions (SSCs), and value added tax (VAT)¹⁰ can create a sudden, non-linear increases in a firm's tax liability that occur when crossing a specific threshold, making the overall tax system more complex and potentially distorting firm behavior by discouraging formalization, investment, and growth.

Online Annex Figure 2.3. Simplified Tax Regimes

1. Active STRs and Revenues Thresholds¹
(Number)



2. CIT Differences between STRs and General Regimes²
(Percentage points)



Sources: national authorities; and IMF staff calculations.

Note: Countries are abbreviated using International Organization for Standardization (ISO) country codes.

¹Revenue thresholds refer to the different brackets within simplified tax regimes that assign multiple tax codes according to revenue levels and/or sectors.

²Simplified regimes included here are as follows: BRA = Microempreendedor Individual (MEI), Simples Nacional (SIMPLES); CHL = Régimen Tributario enfocado a pequeños y medianos contribuyentes (Pro-Pyme); COL = Régimen Simple de Tributación (RST); MEX = Régimen simplificado de confianza (RESICO), Régimen de Incorporación Fiscal (RIF); PER = Régimen Especial de Renta (RER), Régimen MYPE Tributario (RMT). For BRA - SIMPLES, COL - RST, and MEX - RESICO, the median statutory CIT within each STR schedule by revenue bracket and/or sector is used. This illustrates the presence of incentive gaps under these regimes. BRA - SIMPLES rates bundle multiple taxes, including CIT and social security contributions. For comparability with the general regime's CIT of 25 percent, after surtax, the SIMPLES CIT is proxied by subtracting the 9 percent social contribution from the median SIMPLES nominal rate across revenue brackets and sector. For MEX - RIF, the year-1 schedule (100 percent CIT discount from the general regime rate) is used to reflect entry incentives; the discount decreases by ten percent each year over ten years. For PER-RER, there is no annual CIT, but a statutory monthly revenue-based quota of 1.5 percent. CIT = corporate income tax; STR = simplified tax regime.

A sample of several countries that avoided the reliance on STRs is in Online Annex Table 2.4

¹⁰ In addition to impact on CIT, a stream of literature looks at the effect of the VAT threshold on firm growth (Liu and others, 2021, 2024) showing a slowdown in firm turnover when approaching the threshold, but no evidence of compensating acceleration in growth once a firm crosses the threshold.

Online Annex Table 2.4. Countries without Size-Based Tax Regimes

Country	Corporate Income Tax (Percent)	Notes
Czech Republic	19.0	No size-based SME rates.
Denmark	22.0	No size-based SME rate
Estonia	20.0	No size-based rates - 0 % on retained earnings and 20% on distribution
Finland	20.0	No size-based SME rates
Greece	22.0	No size-based SME rates
Hungary	9.0	Lowest flat rate -no size-based SME rates
Latvia	20.0	No size-based rate – CIT applied on distribution
Lithuania	15.0	No-size based SME rate
New Zealand	28.0	Single rate for all companies.
Norway	22.0	Uniform statutory rate
Portugal	21.0	Single corporate rate – Municipal surtaxes apply equally
Sweden	20.6	One flat rate
United States	21.0	One flat federal CIT – Pass-throughs taxed under personal rates

Source: IMF staff.

Note: CIT = Corporate income tax; SME = Small and medium-sized enterprise. In the US C-corp are standard corporations. Most small businesses in the U.S. operate as sole proprietorships, partnerships, LLCs, or S-corps. These are not *special regimes* but *standard entity choices*—profits “pass through” to owners and are taxed under individual rates. Tax filing for small businesses is simplified but not the rates. Data as of end 2024

2.6. Unlocking Business Dynamism: The Power of Reforms

This section provides a more detailed discussion of the successful reforms highlighted in Chapter 2, Box 2.1, focusing on three case studies: New Zealand, Estonia, and Peru. Drawing on empirical literature and policy evaluations, it outlines the major reforms, sequencing, and implementation strategies adopted by each country, and traces their impact on business dynamism—particularly in terms of productivity, firm growth, and resource reallocation. While country contexts differ, the reform pathways exhibit notable similarities: a strong emphasis on removing distortions, deepening market institutions, and enhancing the environment for private sector development (Online Annex Table 2.5).

Online Annex Table 2.5. Summary of Successful Reform Policies and Impacts

Country	Reform Area	Policy Target	Impact
New Zealand Estonia Peru	Trade liberalization and deregulation	Boost competition	Expanded market access
New Zealand Estonia Peru	Financial market deregulation	Deepened financial markets	Expanded credit access
New Zealand Estonia Peru	Tax system overhaul	Enable private credit access	Boosted investment and innovation
New Zealand Estonia Peru	Labor market reforms	Eliminate distortions	Supported firm expansion and resource allocation
Estonia	Digital Governance	Encourage entrepreneurship	Stimulated investment

Source: IMF staff.

New Zealand: A Model of Comprehensive and Well-Sequenced Reforms

In the mid-1980s, New Zealand implemented one of the most comprehensive reform agendas in the OECD, transforming its economy from a heavily regulated system into a dynamic, market-oriented environment. The reform strategy rested on four mutually reinforcing pillars, with reforms carefully sequenced to minimize disruption and maximize private sector responsiveness (Evans and others 1996; Claus 2009; Meehan 2014):

- **Trade liberalization and deregulation (1983–85):** The elimination of import licensing and tariffs fostered domestic competition and global integration, reallocating resources toward high-productivity sectors.
- **Financial market deregulation (1984–85):** Removing interest rate and foreign exchange controls and adopting a floating exchange rate regime expanded access to credit, improved price discovery, and stimulated investment.
- **Tax system overhaul (1984–93):** Distortionary tax provisions were replaced with a broad-based goods and services tax (GST) and lower CIT/PIT rates, easing compliance and encouraging entrepreneurship.
- **Labor market reforms (1991):** Wage bargaining was decentralized and employment flexibility enhanced, supporting job creation and closer alignment between wages and firm-level productivity.

These reforms substantially boosted firm efficiency, broadened financial access, and encouraged entrepreneurship and innovation. As discussed in Chapter 2, Box Figure 2.1, the outcome was a sustained rise in productivity and business dynamism, setting a benchmark for reform-minded economies.

Estonia: From Transition Economy to Unlocking Business Dynamism and Digital Leadership

Following independence in 1991, Estonia pursued rapid and broad-based structural reforms that enabled a successful transition from central planning to a competitive, digital market economy (EBRD 1999; IMF 2012; World Bank 1993; Laar 2008). In addition to the digital transformation, the reform program closely mirrored New Zealand’s model but adapted to the country’s transition context:

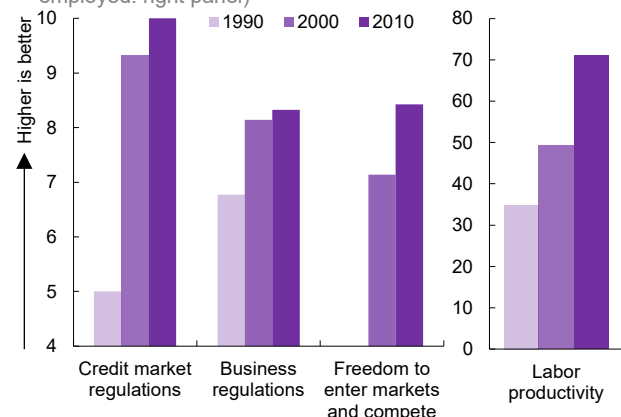
- **Trade liberalization and privatization (1990–95):** Removal of trade barriers and large-scale privatization dismantled state monopolies, enhanced competition, and facilitated resource reallocation toward productive firms.
- **Financial sector reforms (1991–95):** Legal and regulatory reforms—including banking sector restructuring and new bankruptcy legislation—deepened financial intermediation and expanded credit access, especially for new and growing firms.
- **Labor market reforms (1991):** Abolishing size-based policies and increasing flexibility in employment contracts helped firms scale and adapt to changing conditions.
- **Tax system reform (1994):** A flat-rate income tax and VAT simplified compliance, increased predictability, and incentivized formalization and investment.
- **Digital governance reforms (1996–2014):** Leveraging technology, Estonia introduced X-Road, E-Tax, and E-Residency platforms. These reforms improved transparency, reduced transaction costs, and boosted investor confidence, making public services more efficient and business friendly.

The reforms delivered tangible outcomes, driving clear and sustained improvements in the business environment and productivity. The reform-driven policy framework not only facilitated firm creation but also supported long-term firm growth. Key reforms included extensive liberalization of credit and business regulations, with Estonia’s business regulatory quality score improving fivefold between 1990 and 2010—signaling the removal of major barriers to finance and enterprise operations (Online Annex Figure 2.4). The “Freedom to enter markets and compete” indicator also doubled over the same period, reflecting streamlined licensing procedures and a more competitive business environment. Estonia recorded significantly stronger firm entry rates than its high-income peers, with new firm registrations exceeding the peer average by more than threefold. Together, these reforms spurred steady gains in labor productivity, highlighting how improved market functioning, better access to finance, and fairer competition can enhance firm efficiency and resource allocation.

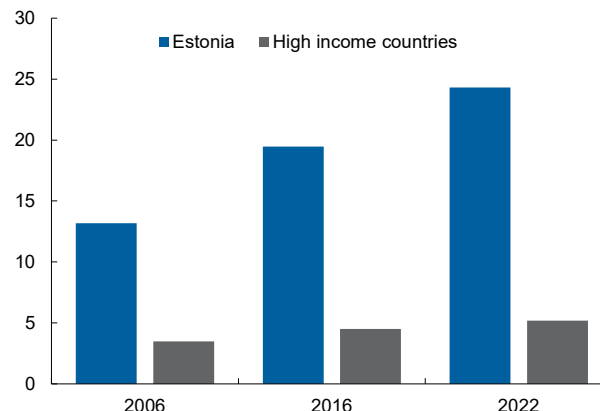
Online Annex Figure 2.4. Estonia: Governance and Market Reforms Outcomes

1. Regulation and Labor Productivity¹

(Index: left panel; 2021 PPP USD in thousands per person employed: right panel)

2. New Business Density Rate²

(New registrations per 1,000 people aged 15-64)



Sources: Fraser institute; and World Bank.

Note: PPP = purchasing power parity.

¹Labor productivity is defined as GDP per person employed in constant 2021 PPP USD.

²The number of newly registered firms with limited liability per 1,000 working-age people (ages 15-64) per calendar year. High income countries aggregation as defined in the World Development Indicators database.

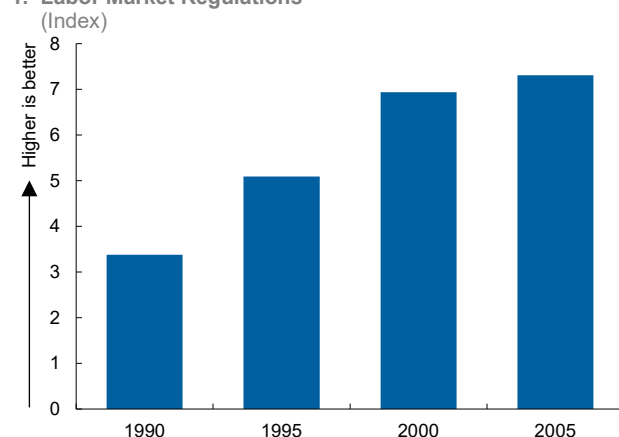
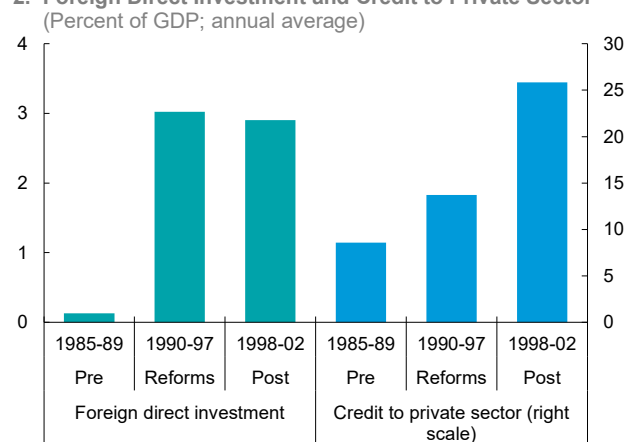
Peru: Liberalization and Stabilization Boosted Business Dynamism

Peru's reform wave in the 1990s emerged in response to severe macroeconomic instability—hyperinflation, fiscal crises, and policy missteps of the 1980s. Inspired in part by New Zealand's experience, Peru's government launched a bold set of structural reforms that reinvigorated the private sector and reconnected the economy to global markets (IMF 2015a; IMF 2015b):

- **Trade liberalization (1990–97):** Tariffs were cut from over 60 percent to under 15 percent, import licensing was eliminated, and the exchange rate unified. This forced firms to improve efficiency and encouraged a shift toward export-oriented sectors.
- **Financial market reforms (1990–93):** Interest rates were liberalized, credit controls removed, and state-owned banks privatized, spurring investment and capital market deepening.
- **Tax system overhaul (1991–98):** The tax base was broadened, rates reduced, and compliance simplified. Size-based distortions that penalized growing firms were eliminated, improving formality and fairness.
- **Labor market reforms (1990–93):** Hiring disincentives were eased through reforms that reduced dismissal costs, allowed fixed-term contracts, and relaxed wage/working-hour regulations.

These reforms led to significant improvements in labor market flexibility, financial intermediation, and capital inflows (Online Annex Figure 2.5). The Labor Market Regulation Index rose from 3.4 in 1990 to 7.3 by 2005, reflecting the impact of measures taken during labor market reforms. Simultaneously, financial sector liberalization and macroeconomic stabilization boosted investor confidence, with foreign direct investment increasing from under 1 percent of GDP (1985–89) to over 3 percent during 1990–97 and remaining elevated thereafter. Credit to the private sector also expanded sharply—from 8 percent of GDP before the reforms to over 25 percent post-reform, signaling deeper financial intermediation and improved access to finance.

Online Annex Figure 2.5. Peru: Labor Markets and Investment

1. Labor Market Regulations¹2. Foreign Direct Investment and Credit to Private Sector²

Sources: Fraser institute; World Bank; and IMF staff calculations.

Note: ¹The Labor Market Regulation index is the simple average of seven subindices: labor regulations and minimum wage; hiring and firing regulations; flexible wage determination; hours regulations; costs of worker dismissal; conscription; and foreign labor restrictions.

²Foreign direct investment shows net inflows. Credit is provided by domestic banks to all other sectors of the economy and non-residents.

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