Productivity in Latin America and the Caribbean: Recent Trends and the COVID-19 Shock[1]
(Background Paper 3)

This chapter studies the patterns and drivers of productivity in Latin America and the Caribbean (LAC) and proposes policy recommendations to boost productivity and make these economies more resilient to downturns. Subpar productivity performance—especially relative to peer emerging markets and advanced economies—has been a drag on LAC's economic growth for decades. LAC's productivity underperformance, both in levels and growth rates, is widespread, cutting across sectors and types of firms. Moreover, economic downturns have historically had a marked adverse impact on productivity in the region, pointing to potentially sizable scars from the pandemic. Behind this pattern of low and fragile productivity are interrelated obstacles, including high levels of informality, burdensome regulations, complex and distortive taxation, and poor governance. Boosting productivity growth and making these economies more resilient requires a policy agenda that prioritizes human capital accumulation, simplifies and modernizes business and labor market regulations—including by facilitating firms' entry and exit—and improves the design of labor and capital taxation.

Introduction and Summary

Following a period of strong economic growth and social progress in the early 2000s, countries in LAC experienced a subpar economic performance since the end of the commodity super-cycle in 2014-15. LAC's growth challenges were exacerbated by the pandemic and, absent policies that unleash the region's growth potential, another "lost decade" could follow—as in the 1980s and 1990s (October 2020 *Regional Economic Outlook: Western Hemisphere*). Moreover, global structural changes such as increased automation, the adoption of new technologies to combat climate change, and a slowdown in trade integration, could increase the volatility of global growth for decades to come, raising the stakes for enhancing LAC's economic resilience.

This chapter presents an assessment of LAC's productivity underperformance over the past two decades, an important factor behind the region's inability to achieve higher growth rates and socioeconomic progress,[2] and discusses possible reforms that could boost productivity growth and make LAC's economies more resilient to economic shocks.

The analysis begins by documenting the region's patterns of productivity in comparison to other emerging market and advanced economies, using both macro- and micro-level data, while identifying key structural constraints that have held back productivity growth in the region. The chapter also explores the impact of economic downturns, including the COVID-19 shock, on productivity. It concludes by outlining policy recommendations. The main findings are as follows:

- LAC exhibits a *substantial and broad-based productivity* gap relative to other emerging markets and developing economies and advanced economies, a key factor behind the region's inability to sustain high economic growth. LAC displays productivity gaps in most sectors, and firms in the region have, on average, lower productivity levels compared to similar firms in other emerging market and developing economies.

- *Informality, burdensome regulation, tax design problems, poor governance and outdated insolvency frameworks that do not facilitate firms' entry and exit* are identified as key obstacles constraining the productivity of LAC's firms.

[2]See Pagés (2010) and Sosa, Tsounta and Kim (2013).

Econometric estimates point to potentially large aggregate productivity gains from removing some of these obstacles, especially those that help reduce informality.

- Some of the obstacles affecting LAC's productivity performance also explain the *region's vulnerability to economic downturns*. For example, high levels of informality are associated with large and sustained declines in productivity in the aftermath of adverse economic shocks.

- *The pandemic is expected to leave larger scars in LAC compared to previous crises and to advanced economies*, largely due to its adverse impact on productivity and human capital accumulation. The magnitude and nature of the shock, along with constraints that prevent a more efficient reallocation of resources within and between sectors, are expected to lead to sizeable and long-lasting reductions in productivity in the region.

- A comprehensive reform agenda that *streamlines and modernizes business and labor regulation* is key to unleashing LAC's potential, by boosting productivity and fostering formalization, while enhancing the region's resilience to economic shocks. The links between productivity, informality, and resilience suggest that the benefits of such agenda can be sizeable. *Improving the design of rules-based tax systems,* allowing for more efficient and progressive taxation while preserving fiscal sustainability objectives, is an important priority. *Lowering entry and exit costs faced by firms by strengthening insolvency frameworks,* a less explored policy dimension in the region, could also help lower informality, a key constraint for productivity growth in LAC. *Tackling the region's longstanding educational quality gap* is likewise crucial to improve human capital accumulation and boost productivity, especially given the large educational losses that the region suffered due to the pandemic. Strengthening social safety nets and retraining programs, especially those that incentivize formalization and human capital improvements, should also be an important part of a policy agenda to facilitate transitions in the labor market.
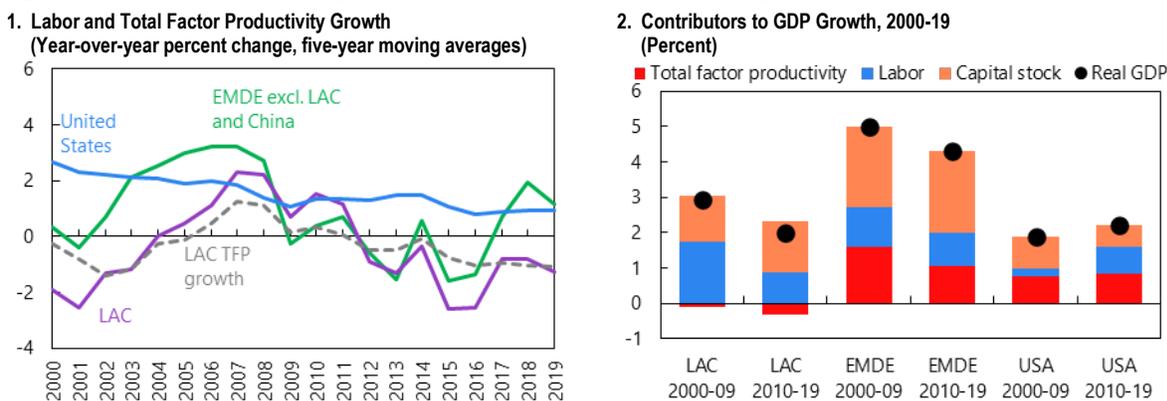
Latin America and the Caribbean's Productivity in Perspective: Pervasive Gaps…

The commodity super-cycle that started in the mid-2000s fueled LAC's economic activity and helped the region reverse the productivity losses that ensued from the banking and economic crises that hit the region during the 1990s, extending through the early 2000s. This pattern holds true when looking at both total factor productivity and labor productivity (Figure 1, panel 1).[3] However, after almost a decade of improvements in the early 2000s, LAC's productivity slowed in the years following the global financial crisis, hampering the region's growth prospects. In fact, as the strength of external tailwinds weakened, the region's productivity growth stalled, contributing to lower growth in LAC in the past two decades, compared to peers (Figure 1, panel 2).

Subpar productivity growth performance in the region since the end of the commodity super-cycle contributed to its long-standing inability to close the productivity gap relative to high-income countries. LAC's labor productivity and total factor productivity steadily declined over the past five decades relative to the levels observed in the United States (Figure 2, panel 1). They both peaked in the late 1970s, prior to the debt crisis of the 1980s, and, with the brief interruption of the commodity super-cycle, saw a sustained decline thereafter.

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[3]Due to the various layers of analysis and the absence of high-quality total factor productivity estimates for some of the data sources used, most of the evidence presented in the chapter will focus on labor productivity. However, macro evidence points to a strong correlation between both measures of productivity, and most results in this chapter are unaffected by the productivity measure used in the analysis. The specific countries included in each exercise, both for LAC and comparators, varies according to data availability.

Figure 1. The Recent Productivity Slowdown Contributes to LAC's Inability to Achieve Sustainable GDP Growth

1. Labor and Total Factor Productivity Growth
   (Year-over-year percent change, five-year moving averages)

2. Contributors to GDP Growth, 2000-19
   (Percent)

Sources: Penn World Tables 10.0; and IMF staff calculations.
Note: Purchasing power parity GDP-weighted average. EMDE = emerging market and developing economies; LAC = Latin America and the Caribbean; TFP = total factor productivity; USA = United States.

LAC's experience stands in contrast to that of other emerging market and developing economies, especially those in Asia and Europe, many of which made strides in closing their productivity gaps relative to the US. Since the turn of the century and until 2015, emerging market and developing economies in other regions displayed a qualitatively similar pattern to that of LAC—strong growth until the global financial crisis, and a marked slowdown thereafter (Figure 1, panel 1). However, emerging market and developing economies in other regions experienced an acceleration in productivity growth alongside a strong growth performance prior to the COVID-19 shock. This helped fast growing Asian emerging market and developing economies achieve significant reductions in their labor productivity gap relative to the United States between 1990 and 2019, as did emerging market and developing economies in Europe (Figure 2, panel 2). By contrast, LAC's average productivity relative to the United States declined between 1990 and 2019.[4]

Figure 2. In Contrast to Other Emerging Markets, LAC's Productivity Gap Relative to the United States Has Widened
(Percent)

1. LAC. Labor and Total Factor Productivity relative to the United States

2. Labor Productivity Relative to the United States: LAC vs. other EMDEs
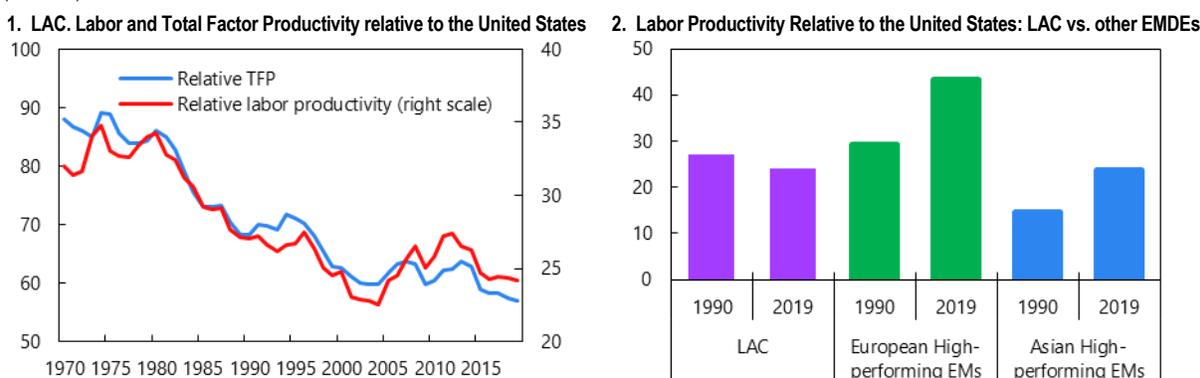
Sources: Penn World Tables 10.00; and IMF staff calculations.
Note: EMDE = emerging market and developing economies; High performing EMs=Bulgaria, Czech Republic, Estonia, Hungary, Indonesia, Malaysia, Poland, Romania, Serbia, Thailand, and Vietnam; LAC=Latin America and the Caribbean; TFP = total factor productivity.
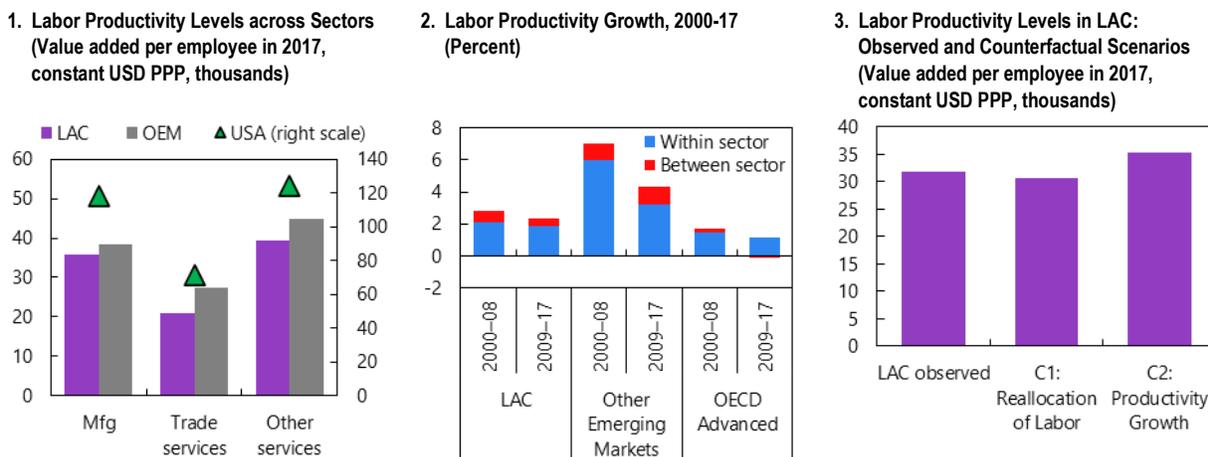
LAC's productivity underperformance cuts across sectors, dimming the potential for productivity gains from sectoral reallocations. As in the United States and other emerging market and developing economies, the level

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[4]LAC's lack of convergence and the stark contrast with emerging market and developing economies in Asia and Europe is also documented in Bakker and others (2020).

of labor productivity in LAC is lower in services than in manufacturing (Figure 3, panel 1).[5] However, LAC's labor productivity gap relative to the United States in 2017 was roughly the same across sectors (sectoral productivity in LAC is roughly 30 percent of that of the United States) and higher than in other emerging market and developing economies. This points to limited productivity gains from between-sector reallocations, a relatively more significant driver of labor productivity growth in other emerging market and developing economies (Figure 3, panel 2), and economy-wide obstacles that cut across sectors.

To further illustrate the role played by sectoral productivity gaps in constraining LAC's aggregate labor productivity growth, Figure 3, panel 3 shows results from two counterfactual exercises (see Annex 1 for details). The first exercise (labeled C1) quantifies aggregate labor productivity gains attained by the average LAC country from replicating the sectoral employment distribution observed in comparator emerging market and developing economies, keeping sectoral labor productivity at LAC's current levels. The exercise implicitly assumes that labor sectoral allocations in LAC are such that they are "trapped" in low productivity sectors (for example, due to rigid labor regulations), and that reallocations that mimic labor shares observed in some benchmark country could result in productivity gains.[6] The second exercise (C2) quantifies the impact on aggregate labor productivity of LAC's catching-up to the productivity levels of comparator emerging market and developing economies, keeping sectoral employment shares at the region's current levels. Labor productivity gains from the second counterfactual are much larger due to the overall low productivity levels observed across sectors in the region.

Figure 3. Productivity Gaps Affect All Sectors, Limiting the Potential Gains from Between-Sector Reallocations

1. **Labor Productivity Levels across Sectors (Value added per employee in 2017, constant USD PPP, thousands)**

2. **Labor Productivity Growth, 2000-17 (Percent)**

3. **Labor Productivity Levels in LAC: Observed and Counterfactual Scenarios (Value added per employee in 2017, constant USD PPP, thousands)**

Sources: Dieppe (2021); and IMF staff calculations.
Note: Purchasing-power-parity GDP-weighted average. Sectoral labor productivity is calculated for eight sectors: agriculture, construction, financial and business services, manufacturing, mining, other services including transport services, trade services, and utilities. LAC = Argentina, Belize, Bolivia, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, Guatemala, Honduras, Jamaica, Mexico, Paraguay, Saint Vincent and the Grenadines, and Uruguay; Other emerging markets = Azerbaijan, Bulgaria, Fiji, Croatia, Hungary, Indonesia, India, Malaysia, Rep. of Mongolia, Montenegro, Philippines, Poland, Romania, Russia, Serbia, Sri Lanka, Thailand, and Türkiye. PPP = purchasing power parity; USD = US dollar.

Firm-level analysis shows that even formal firms in LAC exhibit lower labor productivity levels compared to those in other emerging markets, and that they also underperform in key areas associated with productivity growth. Data from the World Bank Enterprise Surveys, which contains information on a representative sample of firms (services and manufacturing) in the private sector in LAC and in other emerging markets,[7]
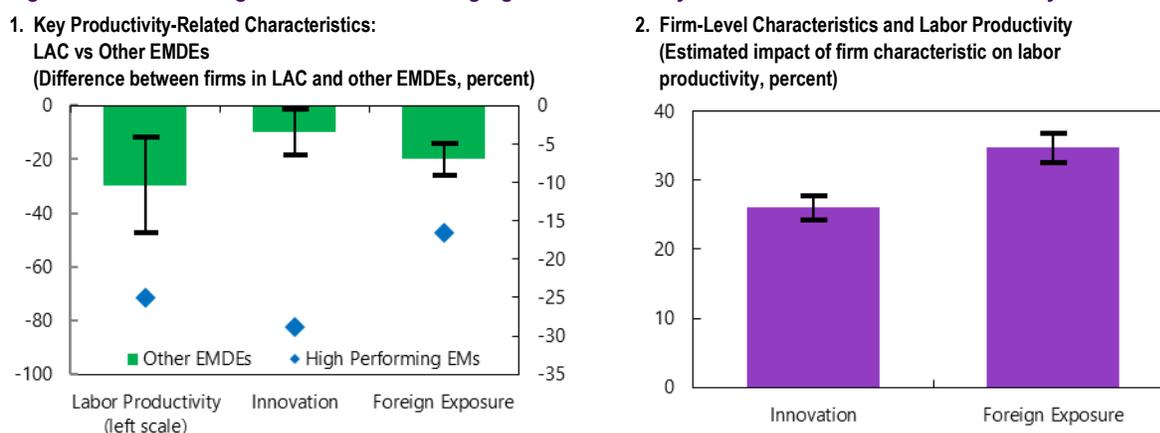
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[5]Using data for the 1950-2005 period, Pagés (2010) shows that labor productivity in services in LAC grew at a slower pace compared to other country groups and, within LAC, their growth was weaker relative to other sectors. Beylis and others (2020) argue that there is increasingly a blurred line between services and manufacturing since many manufacturing firms are not only integrating more services into their production function, but also selling and exporting more services as integrated activities. They also make a distinction between luxury and necessity services, arguing that they are, respectively, typically low and high productivity subsectors.
[6]See McMillan, Rodrik and Verdugo-Gallo (2014) for such an argument.
[7]See Annex 1 for more information on World Bank Enterprise Surveys, its design, and the econometric specification used in the analysis.

show that formal firms in LAC exhibit significantly lower labor productivity levels relatively to comparable firms in other emerging market and developing economies and in high-performing emerging markets (30 percent and 70 percent gap, respectively) (Figure 4, panel 1).[8,9] This gap is partly related to lower levels of innovation—LAC firms are less likely to hold international certifications, invest in innovation, and introduce new products or new processes compared to firms in other emerging market and developing economies— and to lower foreign exposure. The latter indicates that they are less likely to export to foreign markets or be subsidiaries of multinational corporations.[10] In turn, innovation and foreign exposure are strongly correlated with productivity (Figure 4, panel 2).[11]

Figure 4. LAC Firms Lag Those in Other Emerging Markets in Many Areas Associated with Productivity Performance

1. **Key Productivity-Related Characteristics: LAC vs Other EMDEs**
   (Difference between firms in LAC and other EMDEs, percent)

2. **Firm-Level Characteristics and Labor Productivity**
   (Estimated impact of firm characteristic on labor productivity, percent)

Sources: IMF, World Economic Outlook; World Bank; World Bank Enterprise Surveys; and IMF staff calculations.
Note: In panel 1, bars indicate estimated differences between LAC firms and those from other EMDEs, diamonds show estimated difference between firms in LAC and in high-performing EMs. For labor productivity, differences are in percent. Innovation is an indicator variable that captures whether a firm holds international certifications, invests in research and development, or introduced a new product or a new process. Foreign exposure is an indicator variable that captures whether a firm exports or is a subsidiary of a multinational firm. In panel 2, bars show the correlation between the innovation and foreign exposure dummies and labor productivity. In both panels, lines represent 90 percent confidence intervals. Details about the econometric specification, the sample, and the indices can be found in Annex 1. EM = emerging market; EMDE = emerging market and developing economy; LAC = Latin America and the Caribbean

Widespread productivity gaps suggest that economy-wide factors underpin the region's productivity and innovation underperformance. Leveraging firm-level surveys along with analysis of the related literature, the next section identifies key bottlenecks affecting the region's productivity potential and quantifies the impact that improvements in each of these areas could bring to the region.

… with Informality, Burdensome Regulation, Complex and Distortive Taxation, and Weak Rule of Law Playing a Big Role

At the heart of productivity growth are innovation decisions taken by firms, shaped by their managerial skills along with the enabling environment under which they operate (Cusolito and Maloney 2018). Empirical evidence suggests that firms in LAC underperform relative to peers both in terms of productivity and innovation. So what lies at the heart of this underperformance?

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[8]For firms in the manufacturing sector, it is possible to calculate firm-level measures of total factor productivity, incorporating information on the effective use of physical capital. However, given the large share of firms operating in services, the analysis focuses on labor productivity instead, which is available for all firms regardless of their sector of operation.

[9]Results reflect the gap between the average LAC firm and those in other emerging markets, and thus masks potential heterogeneity in firms' performance and the fact that many firms in LAC may have labor productivity levels above those of the average emerging market firm.

[10]Despite being more productive and prone to innovation than local firms, Lederman and others (2014) show that local affiliates of multinational corporations operating in LAC underperform those operating in other regions.

[11]The link between innovation and productivity is documented in Hall (2011). The link between foreign exposure and productivity is documented in Melitz (2003); Girma, Greenaway and Kneller (2004); and Lederman and others (2014).

Some economy-wide structural and regulatory factors are perceived as key constraints to firm performance in the region. Informality, burdensome business and labor regulation, taxation, and poor governance (which comprises aspects such as corruption, functioning of courts, and political stability) are identified as the most salient constraints to firm performance by firms in LAC (Figure 5).[12] Moreover, firms in the region are more likely to list these structural and regulatory factors as major obstacles to their performance compared to those in comparator emerging market and developing economies (Figure 6, panel 1).

Econometric evidence confirms the detrimental impact of these structural and regulatory factors on productivity. Figure 6, panel 2, shows that firms that list regulatory and structural factors as major obstacles have substantially lower productivity levels.

Figure 5. Taxes, Labor Regulation, Informality, and Poor Governance are the Main Obstacles to Firm Performance
*(Biggest obstacles faced by firms in LAC, percent of firms)*
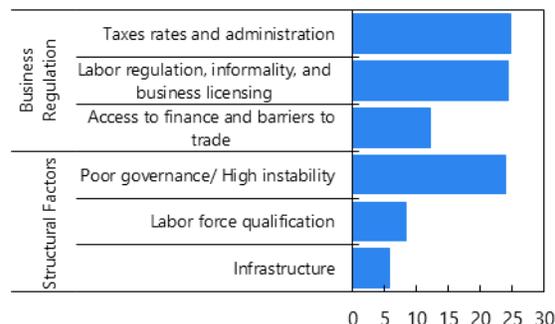
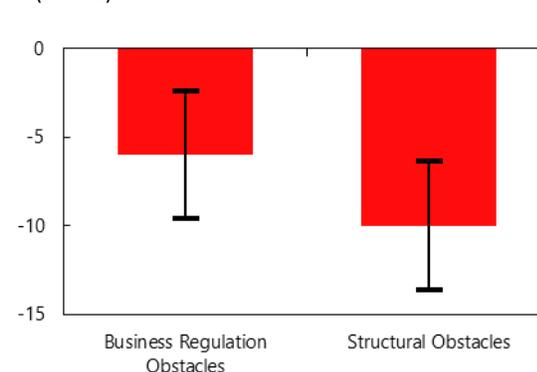Sources: World Bank, World Bank Enterprise Surveys; and IMF staff calculations.
Note: Bars indicate the percentage of firms in LAC that identify the factors indicated in the *y*-axis as the biggest obstacle to their business operation. LAC = Latin America and the Caribbean.

These links have also been documented in previous studies, which highlight how regulatory and institutional variables affect firms' investment and innovation decisions. For example, Amin and Okou (2020) find that formal firms that face high levels of competition from informal ones have relatively lower levels of productivity. The April 2017 *Fiscal Monitor* shows that tax systems can have an adverse effect on productivity by potentially generating misallocation and by tilting firms' demand for inputs towards those that are tax-favored instead of those that are most productive.

Figure 6. Taxes, Labor Regulation/Informality, and Weak Rule of Law Appear to be Constraints on Firms' Productivity

1. **Difference in Key Characteristics between Firms in LAC and in Other EMDEs**
(Percent)
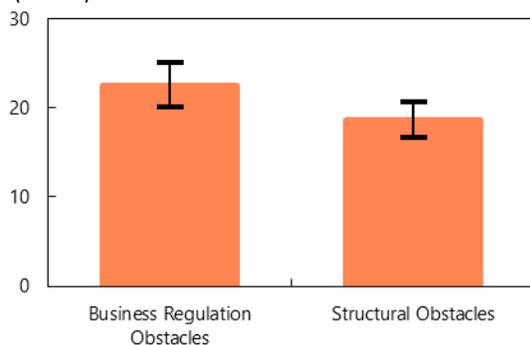
2. **The Impact of Business Obstacles on Firm-Level Labor Productivity**
(Percent)

Sources: IMF, World Economic Outlook database; World Bank, World Bank Enterprise Surveys; and IMF staff calculations.
Note: In panel 1, bars indicate estimated coefficients comparing firms in LAC with firms in other EMDEs. In panel 2, bars indicate coefficients of a set of regressions that estimate the relation between firm-level characteristics and labor productivity. Lines represent 90 percent confidence intervals. See Annex 1 for details. EMDEs = emerging market and developing economies; LAC = Latin America and the Caribbean.

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[12]The survey asks two questions about perceived obstacles. The first question, used in Figure 5, asks firms to choose the major obstacle it faces out of a list of fifteen options: (1) access to finance; (2) access to land; (3) business licensing and permitting; (4) corruption; (5) courts; (6) crime; theft and disorder; (7) customs and trade regulations; (8) electricity; (9) inadequately educated labor force; (10) labor regulations; (11) political instability; (12) practices of competitors in the informal sector; (13) tax administration; (14) tax rates; and (15) transport. The second question asks firms to determine whether each of the 15 obstacles is deemed a major obstacle. This question is used in the econometric analysis. To reduce the dimensionality of the variable, the chapter groups the list of 15 obstacles in two ways. The first, creates a list of eight structural obstacles and seven regulatory obstacles. The second, creates six categories based on topics. For further details, see Annex 1.

Firm obstacles listed in the World Bank Enterprise Surveys not only affect productivity by distorting firm-level decisions, but they can also impact productivity by affecting the pool of firms that enter the market. For example, there is evidence of a larger share of family-run businesses in LAC compared to the United States (Lederman and others 2014), a trait that is more prevalent in countries with weaker rule of law (Iacovone, Maloney, and Tsivanidis 2019). Family-run firms typically have weaker management practices and are less productive than other firms. More broadly, Cirera and Maloney (2017) show that firms in the region have poorer management practices than what their income levels would predict, which may be related in part to the region's strict labor regulations (Bloom and van Reenen 2010; IMF 2019).[13] Importantly, this is not only true for informal firms, but also for formal ones. Better management practices, in turn, are associated with higher levels of innovation (Cirera and Maloney 2017) and productivity (Bloom and van Reenen 2007; Bloom and others 2019).

Econometric evidence from aggregate total factor productivity growth regressions confirms the link between productivity, informality, and poor governance found using firm-level data. Figure 7, panel 1, shows results from a panel regression of productivity growth on a set of variables identified in the literature as determinants of economic development and growth. It includes lagged levels of GDP per capita, commodity terms-of-trade growth, an index of human capital, trade openness, economic volatility (measured by the standard deviation of the output gap), informality, and an index of governance.[14] Results are in line with previous findings that have studied these covariates in isolation—productivity growth is higher when informality is lower, when trade openness is higher, when human capital is higher, and when political and economic instability is lower.[15] Informality appears to have the largest impact on productivity growth, but coefficients for other controls are also economically and statistically significant.
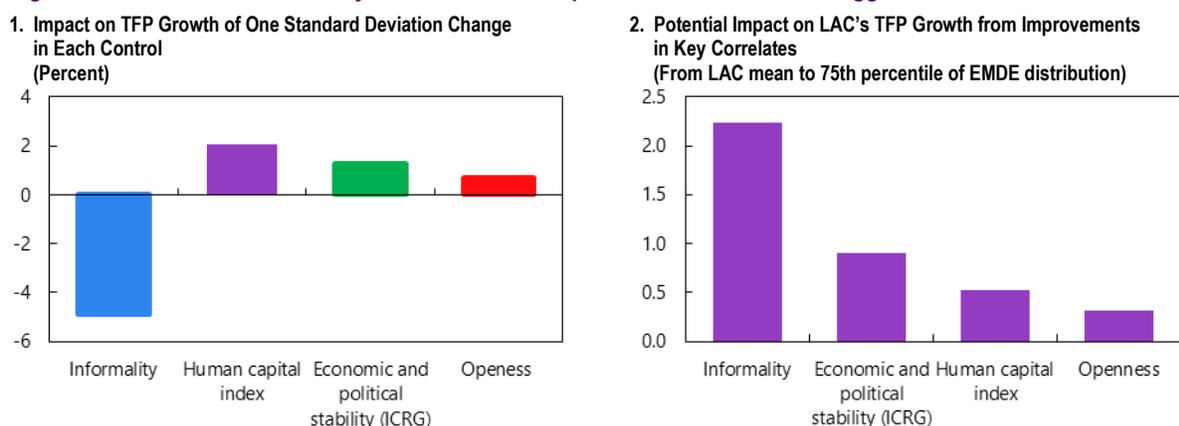
Results thus suggest that LAC countries could achieve substantially higher total factor productivity growth if they reduce informality to reach the levels observed in the best performing emerging market and developing economies, with more moderate gains from improvements in governance, and increases in openness and human capital. The average LAC country would experience a 2-percentage point increase in total factor productivity growth if it were to increase its GDP formality rate from its current level to that observed in the 75th percentile of the emerging market and developing economies' formality distribution (Figure 7, panel 2). Improvements in economic and political stability increase total factor productivity growth by about 1 percentage point, while improvements in human capital and trade increase total factor productivity growth by about 0.5 percentage points. Note, however, that the sizeable increase in total factor productivity growth stemming from reductions in informality is both a reflection of the large value of the informality coefficient in the growth regression and the large gap between the average LAC country and the 25th percentile of the emerging market and developing economy distribution in terms of informality rates (roughly 10 percentage points; see Ohnsorge and Yu 2022). The gains from improvements in human capital may have become larger (and more challenging to achieve) in the aftermath of the COVID-19 shock, as the impact of the pandemic on the region's human capital is estimated to be quite large (World Bank 2022). Moreover, while LAC has improved substantially the quantity of human capital, the region underperforms in terms of its quality, suggesting that productivity gains from improvements in human capital may be understated in the exercise.

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[13]Labor market regulations that constrain the ability of managers to hire, fire, pay, and promote employees could reduce the quality of management practices. As shown in Bloom and van Reenen (2010), tougher labor market regulation is significantly negatively correlated with the management scores on incentives, which captures whether firms promote and reward employees based on performance and whether they try to keep their best employees.

[14]Lagged GDP is included to control for income convergence. Human capital is included since more highly skilled workers are better placed to contribute to technological advances and to help absorb new technologies, including ones from abroad (Benhabib and Spiegel 2003; Romer 1990). Openness boosts technological convergence by facilitating the transfer of technology via the technological content of imports (Lumenga-Neso, Olarreaga and Schiff 2005), and from productivity improvements attained by exporters (De Loecker, 2013). The link between governance (proxied by the ICRG composite index), of which economic and political stability is one dimension, and growth, is studied in Acemoglu, Antràs and Helpman (2007). Similarly, Bakker and others (2020) show that governance is a key factor explaining productivity gaps across countries.

[15]Economic volatility reduces growth, but the estimated coefficient is not significant.

Figure 7. Reductions in Informality and Rule of Law Improvements Could Boost Aggerate TFP Growth in LAC

1. Impact on TFP Growth of One Standard Deviation Change
   in Each Control
   (Percent)

2. Potential Impact on LAC's TFP Growth from Improvements
   in Key Correlates
   (From LAC mean to 75th percentile of EMDE distribution)

Sources: Gruss and Kebhaj (2019); ICRG; IMF, World Economic Outlook database; Penn World Tables 10.0; Ohnsorge and Yu (2022); World Bank, World Development Indicators, and IMF staff calculations.
Note: In panel 1, Bars indicate estimated coefficients of a panel regression of TFP growth that also includes lagged GDP per capita, terms-of-trade growth, and output gap volatility. These variables have smaller impact on TFP growth relative to those shown in bars. For details on the specification, see Annex 1. EMDE = emerging market and developing economies; LAC = Latin America and the Caribbean; TFP = total factor productivity.

In addition, the large impact of informality on productivity partly reflects the fact that both are a byproduct of key regulatory and institutional factors, many of which are not included in our econometric exercise. As shown earlier, regulatory obstacles are associated with low productivity. Similar obstacles have been found to exacerbate informality. For example, an overly complicated tax system can be costly and time-consuming from the firm's point of view and can discourage formal registration, especially of firms with poor profitability (Morales and Medina 2017; Rocha, Ulyssea, and Rachter 2018; Ulyssea 2018). Similarly, there is a well-established link between labor regulations and informality in emerging markets (see Ulyssea 2018; Alvarez and Ruane 2019; David, Lambert, and Toscani 2019). The impact of regulation on informality, however, is lower in countries with better governance (Loayza, Oviedo and Serven 2005). Thus, reform efforts that ease some of these obstacles can lead to large productivity enhancements by affecting productivity directly and indirectly through lower informality. Finally, there is a negative relationship between the aggregate level of human capital in a country and informality (David, Lambert, and Toscani 2019).

There is also a complex, bidirectional relationship between productivity and informality. On the one hand, informality affects productivity both directly and indirectly. Informal firms are substantially less productive than formal firms (Amin and Okou 2020).[16] However, informality affects productivity through additional indirect channels. For example, access to informal employment may distort firms' incentives to invest in worker training, which in turn can hamper productivity. Also, competition from informal, unregulated firms, may affect formal firms' incentives to invest and innovate as they may not accrue the full benefits of these investments. The adverse impact of informality on firm performance is confirmed by the econometric analysis using World Bank Enterprise Surveys, which shows that firms in countries with higher levels of informality have, on average, lower labor productivity levels (see Annex Table 1.1). On the other hand, low productivity can increase informality since low productivity firms typically have subdued growth and employment potential, thus pushing many potential workers into informality (see Perry and others 2007; Lederman and others 2014). All this points to potentially large effects of a policy agenda that addresses simultaneously informality and productivity.

So far, the chapter has explored factors lying behind LAC's productivity underperformance, pointing to informality along with some other key structural factors as key barriers to productivity growth improvements in the region. However, the region's economic performance has arguably been affected by frequent external

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[16]The productivity gap between formal and informal firms is attributed to more limited access to new technologies, more limited ability to attract skilled labor and to exploit economies of scale, and lower access to services and funding (Ohnsorge and Yu 2022).

and domestic shocks, many of which have resulted in crises. In fact, there is growing evidence of the scarring effects of economic crises on productivity, especially in the aftermath of the global financial crisis (Adler and others 2017; Furceri and others 2021). Against this backdrop, the next section quantifies the impact that past economic downturns had on LAC's productivity and sheds light on the likely impact that the COVID-19 crisis could have on the region's productivity growth going forward.

Historically, Economic Downturns Left Lasting Scars on the Region's Productivity, and the Effects of COVID are Expected to be Large

Economic crises trigger forces that can have opposing effects on productivity. They can result in the "cleansing" of unproductive firms (Caballero and Hammour 1994) leading to fewer but more productive firms entering the market (Hallward-Driemeier and Rijkers 2013; Ates and Saffie 2021), forces that can lead to higher aggregate productivity. However, crises can also worsen firm-worker matching (Barlevy 2002), lead to inefficient allocation of resources, and trigger exit of financially constrained, productive firms (Hallward-Driemeier and Rijkers 2013) while keeping unproductive ones in the market (the so-called zombie firms). Thus, the overall impact of crises on aggregate productivity likely depends on country characteristics.

Evidence from a local projection model suggests that, in LAC, economic downturns result in large and protracted reductions in labor productivity.[17] Historically, the average LAC country experienced a reduction in labor productivity of about 5 percent after economic downturns relative to its pre-crisis level (Figure 8, panel 1).[18] Moreover, labor productivity remained over 5 percent below such levels four years after the shock. By contrast, the average advanced economy experienced a more moderate contraction in labor productivity, followed by a robust rebound (albeit without a full return to the pre-shock level).[19]

Some of the structural factors associated with LAC's long-term productivity underperformance also appear to have played a role in the region's sluggish productivity response in the aftermath of crises. Figure 8, panel 2, shows that countries with high informality typically experience long-lasting productivity scars, while productivity recovers more quickly in countries with low levels of informality. Countries where informal firms are commonplace exhibit weaker productivity-enhancing resource reallocation in the aftermath of adverse shocks because informal firms are less likely to exit following negative shocks (Dix-Carneiro and others 2021). This result also reflects the fact that high informality is related to stringent labor regulation, which impedes resource reallocation and limits a country's economic flexibility (Caballero and others 2013; David, Pienknagura and Roldós 2020).
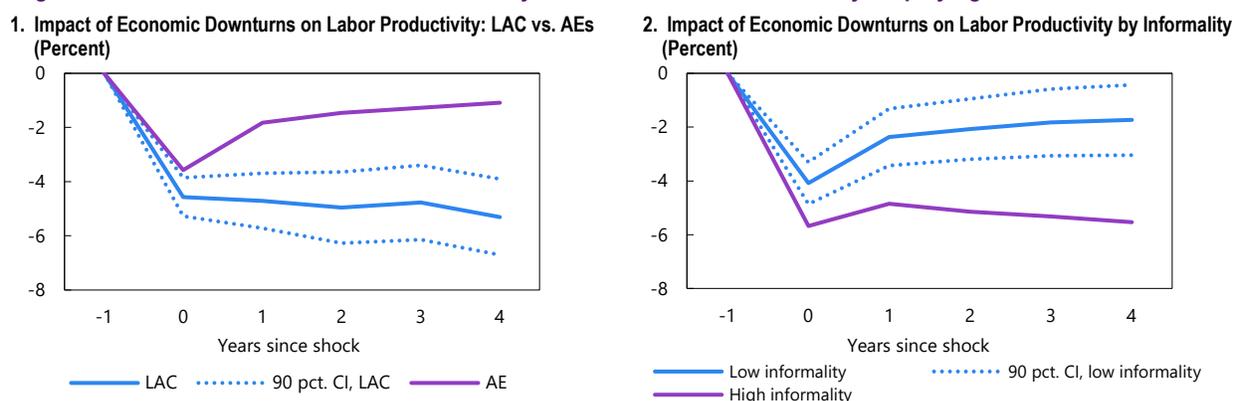
The global financial crisis—the most recent region-wide economic downturn for which data are readily available—sheds additional light on LAC's productivity performance in times of crisis, with firms in the region experiencing larger productivity reductions compared to firms in other emerging markets. Evidence from the World Bank Enterprise Surveys shows that average labor productivity among LAC firms declined in the aftermath of the global financial crisis (Figure 9, panel 1). Moreover, the post global financial crisis decrease in average productivity was larger for high productivity firms in LAC (Figure 9, panel 2). These are firms with the highest growth and employment potential (Lederman and others 2014), highlighting the detrimental impact of the global financial crisis on the region's growth and employment prospects. By contrast, the average productivity of firms in other emerging market and developing economies remained unchanged after the global financial crisis (Figure 9, panel 1).

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[17]Economic downturns are defined as years of negative real GDP growth that are preceded by positive growth. Results are qualitatively similar if we focus on large recessions, defined as years when GDP remains below pre-shock levels for at least two years, and if total factor productivity is instead used as the variable of interest. See Annex 1 for details on the econometric specification and additional technical details.

[18]LAC's response is in line with that of the average emerging market and developing economy in other regions (not shown in chart).

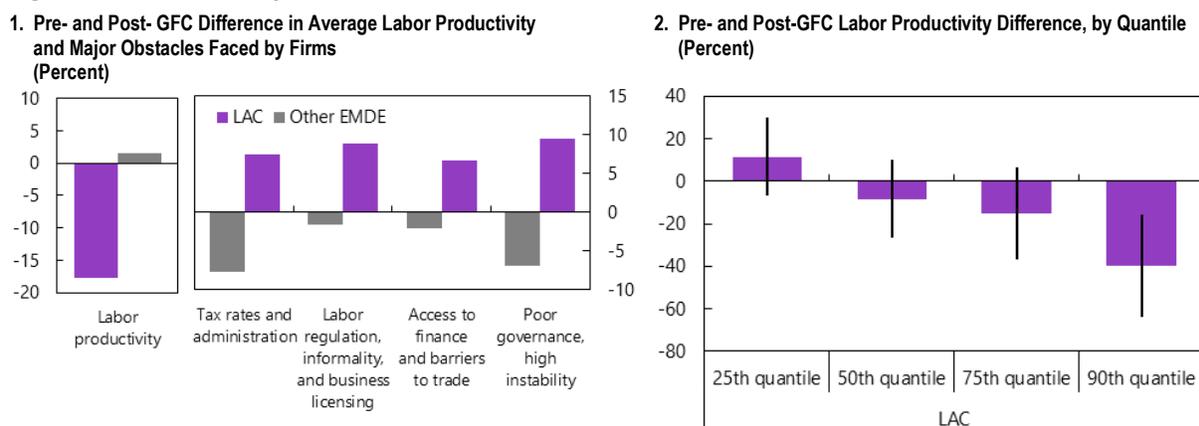[19]The findings are similar as those found by Furceri and others (2021).

Figure 8. Past Downturns Resulted in Productivity Losses in LAC, with Informality Amplifying Effects

1. Impact of Economic Downturns on Labor Productivity: LAC vs. AEs
(Percent)

2. Impact of Economic Downturns on Labor Productivity by Informality
(Percent)

Legend (panel 1): LAC ——— 90 pct. CI, LAC ········ AE ———

Legend (panel 2): Low informality ——— 90 pct. CI, low informality ········ High informality ———

Sources: Ohnsorge and Yu (2022); Penn World Tables 10.0; and IMF staff calculations.
Note: Solid lines represent the dynamic response of labor productivity to economic downturns estimated through local projections. Dashed lines are the 90 percent confidence intervals. For details on the econometric specification see Annex 1. AEs = advanced economies; CI = confidence interval; LAC = Latin America and the Caribbean.

The sharper productivity decline observed among LAC firms arguably reflected an increase in the perception of obstacles faced by firms in the region after the global financial crisis, as indicated by their stated concerns. Figure 9, panel 1, shows that the structural and regulatory factors identified as major obstacles to firms' operations in LAC in the previous section—the incidence of taxation, labor regulation and informality, and poor governance—all increased after the global financial crisis and increased more than in other emerging market and developing economies—which have seen instead a reduction in some obstacles after this crisis. To be sure, this does not necessarily imply actual changes in these factors (for example, changes in labor regulation). Rather, it suggests that, as economic conditions in the region deteriorated in the aftermath of the global financial crisis, some of these obstacles became more binding constraints to firm performance.

Figure 9. Firm Productivity Declined in the Aftermath of the GFC and Obstacles Became More Salient

1. Pre- and Post- GFC Difference in Average Labor Productivity and Major Obstacles Faced by Firms
(Percent)

Legend: ■ LAC ■ Other EMDE

2. Pre- and Post-GFC Labor Productivity Difference, by Quantile
(Percent)

Sources: IMF, World Economic Outlook database; World Bank, World Bank Enterprise Surveys; and IMF staff calculations.
Note: Chart based on data from last survey before the global financial crisis (around 2007) and first survey after the global financial crisis (around 2015). Specific years vary by country due to availability of surveys. In panel 1 bars indicate the estimated difference in key variables pre- and post-GFC for an average firm. In panel 2, bars represent the result of quantile regressions that estimate the post-GFC difference in firms' labor productivity in LAC relative to other Emerging market and developing economies at different quantiles of the productivity distribution. See Annex 1 for more details on the econometric strategy and for definition of variables. EMDEs = emerging market and developing economies; GFC = global financial crisis; LAC = Latin America and the Caribbean.
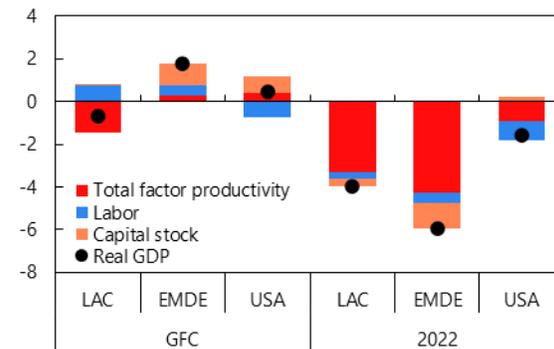
The adverse effect of the global financial crisis on LAC's productivity is also evident from aggregate data. A simple growth-accounting exercise illustrates that after the global financial crisis, output losses in LAC relative to a pre- global financial crisis trend were largely explained by a downward trend in productivity (Figure 10). Such pattern was not observed in the US or even other emerging markets around the global financial crisis, where, in fact, total factor productivity *increased*, contributing to output gains relative to the pre-global financial crisis trend.

Given the experience of previous crises, can the post-COVID-19 recovery yield a different productivity response? Current projections suggest this will not be the case. A similar growth accounting exercise shows that the pandemic is expected to result in larger output losses in LAC compared to the United States and even

Figure 10. Productivity Fell in LAC during the GFC, and the Impact of COVID is Expected to be Larger

Sources: IMF, World Economic Outlook database; and IMF staff calculations.
Note: For GFC, comparison of October 2009 and October 2010 World Economic Outlook projections in 2010. For 2022, comparison of January 2020 and October 2022 World Economic Outlook projections. EMDE = emerging market and developing economies; GFC = global financial crisis; LAC = Latin America and the Caribbean; USA = United States.

to the region's performance in the aftermath of the global financial crisis, driven by sizable productivity gaps relative to pre-pandemic trends.[20] The larger adverse effect of the pandemic on LAC's productivity is associated with the length, severity, and nature of the shock, which affected disproportionately large sectors of the economy (Box 1). In other emerging market and developing economies, productivity losses post-COVID-19 are expected to be even larger than in LAC as of 2022, a pattern that may be explained by the positive effects that the rebound in commodity export prices had on the region's activity and the relatively larger support programs in LAC in 2020.[21]

Such adverse effects of crises on productivity and long-term growth prospects could become compounded if the post-pandemic employment recovery is biased toward low-productivity sectors, where informality is prevalent. Crises typically result in employment reallocations, especially informal employment, toward services. However, the COVID-19 shock resulted in an atypical employment response, whereby labor informality decreased initially due to the burden of the pandemic on (largely informal) contact-intensive sectors. As the recovery took steam, informal employment has recovered, and is expected to increase in the medium-term relative to pre-pandemic levels (Cavallo and others, 2022; October 2022 *World Economic Outlook*). The strong recovery in informal employment was an important margin of adjustment that facilitated the recovery in many LAC countries by absorbing idle workers, playing a traditional "buffering role" (Alvarez and Pizzinelli 2021). The risk, however, is that a large share of workers/factors of production may remain trapped in small, less productive firms, which would hamper medium-term productivity growth prospects.[22]

The bleak productivity outlook for LAC stands in contrast to forecasts for the United States, where GDP and productivity losses are expected to be smaller This in part reflects the policy support deployed by advanced economies, including the United States, during the pandemic, which was larger than in LAC countries and was crucial in limiting scarring (October 2022 *WEO*). Over the medium term, the significant educational losses in LAC experienced during the pandemic may reduce the productivity growth potential in the region

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[20]There are downside risks to the contribution of physical and human capital to GDP scarring. Firms' investment fell sharply in the initial stages of the pandemic, and, despite support programs in many countries, it has rebounded mostly in sectors that were less vulnerable to the shock (Powell and Rojas-Suarez 2022). The end of support programs, combined with volatile international markets and weaker growth prospects, could further constrain firms' ability to finance new investment. Similarly, absent policies, human capital losses may be exacerbated by the pandemic's heavy toll on LAC's educational systems.

[21]See https://www.imf.org/en/Topics/imf-and-covid19/Fiscal-Policies-Database-in-Response-to-COVID-19.

[22]Powell and Rojas-Suarez (2022) document a large increase in the number of micro and small firms in LAC in the aftermath of the pandemic. As argued in Arias and others (2018), the costs of moving into formal jobs are higher than those of moving to informal ones, suggesting that informal employment spells can be long lasting.

further, particularly in comparison with the United States, other advance economies and high-performing emerging market and developing economies.

More broadly, economic policies that contribute to the kind of economic flexibility needed to limit the scars left by economic crises also appear to explain differences in productivity dynamics between LAC countries and the United States. The next section discusses how actionable policies could bolster a sustainable post-COVID-19 recovery while preparing the region for future shocks.

Unleashing LAC's Potential: Policies to Boost Productivity and Enhance Resiliency

Addressing LAC's productivity challenges will require a strategy that tackles in concert the region's longstanding obstacles, which have affected productivity growth and made the region particularly susceptible to shocks, and the impacts of the pandemic. This section focuses on three specific policy areas that, based on the chapter's previous analysis, should be an integral part of the region's productivity agenda. Improvements in these areas could foster formalization, increase productivity, and enhance flexibility and resilience to shocks. Importantly, the symbiotic relationship between informality and productivity suggests that the benefits of this agenda could be large, especially if many of its elements are implemented simultaneously.

Improving Tax Design to Provide Productivity-Enhancing Incentives

The structure of tax systems in LAC tends to encourage informality, undermine investment, and, as a result, constrain productivity. The effective tax rate on formal employment in LAC is relatively high—once social security contributions are included and corrections for labor formality are considered—and encourages informality. Evidence in IMF (2021) also points to personal income tax design flaws and a regressive structure of social security contributions, which foster informality and hurt growth.

LAC's productivity could benefit from a tax reform agenda that promotes labor formalization, reduces misallocation, and ensures predictability. Efforts to reduce the labor tax wedge by improving the design of the personal income tax and social security contributions and other labor taxes, particularly in the case of low-wage earners and female workers, could help boost productivity in the region by encouraging formalization. Strengthening tax design could include the provision of well-targeted incentives for labor force participation, particularly of female workers, through an earned income tax credit. Such earned income tax credit could also provide incentives for labor formalization by compensating social security contributions, which almost entirely explain the labor "costs" or tax wedge of the average worker among the largest countries in the region (Figure 11). Colombia provides an example of a tax reform that successfully reduced labor costs and, as a result, informality. A large reduction in payroll tax rates in 2012 reduced employment informality in the main metropolitan areas by about 7 percentage points (Fernandez and Villar 2017).

Figure 11. High Labor Tax Wedges in LA7 Discourage Formalization
(Formal labor tax wedge)
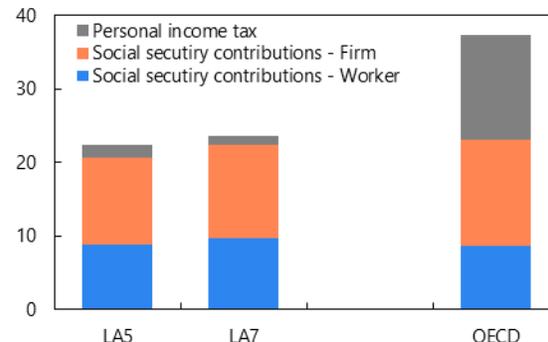
Sources: IMF staff calculations based on the October 2021 *Regional Economic Outlook: Western Hemisphere* Background Paper 1.
Note: Staff estimates using OECD tax wedge methodology with the amendment that all mandatory SSCs are included regardless of whether they are collected into publicly or privately-run funds. LA5 = Latin America 5 (Brazil, Chile, Colombia, Mexico, Peru); LA7 = Latin America 7 (Argentina, Brazil, Chile, Colombia, Mexico, Peru, Uruguay); OECD = Organisation for Economic Co-operation and Development.

The design of capital taxation can also be strengthened to make it less distortive and boost productivity (De Mooij and others 2020). Taxing equally interests, dividends and capital gains simplifies the system, prevents

distortions in the allocation of assets, and could broaden the tax base in some cases. Corporate income taxation that better captures economic rents, by designing it as a cash flow tax where investment can be fully expensed, could also foster good-quality investment projects. Likewise, the use of rules-based and cost-focused tax incentives such as accelerated depreciation and investment tax credits for research and development, rather than profit-based incentives (special zones, tax holidays), could also bolster innovation. Such improvements in the taxation of capital could reduce firms' tax compliance costs, facilitate formalization, and boost productivity in the region.[23]

Importantly, improvements in tax design need to be consistent with fiscal and macro-stability objectives. Reform of different taxes may need to be sequenced to avoid negative effects on revenue collection that could compromise fiscal sustainability. Similarly, the timing of implementation should reflect the state of the economy and fiscal needs (IMF 2021). These are important considerations to reduce the risk of macro-economic crises that, as shown earlier, could hamper productivity prospects.

## Bolstering the Region's Human Capital and Preparing It for the Future

LAC countries made significant strides in key dimensions of human capital formation, especially over the two decades preceding the pandemic. Access to primary and secondary education expanded since the 1960s (Bruns and Luque 2015) and higher education expanded markedly in LAC between 2000 and 2019, with access becoming more equitable (Ferreyra and others 2017).

Despite this progress, there are key dimensions where the region still lags. Secondary students underperform peers from other countries in international test scores, a pattern that is related, among other things, to poor teacher quality (Bruns and Luque 2015). The large expansion in tertiary education in many countries is concentrated in lower quality institutions and drop-out rates are relatively high (Ferreyra and others, 2017). Moreover, the region lacks the type of human capital—engineers and scientists—that is likely to facilitate exporting activities (Brambilla, Lederman, and Porto 2017, 2019), produce innovative entrepreneurs and yield workers with appropriate skills (Lederman and others 2014).

Improving human capital in LAC, especially on the quality margin, could help reduce informality and boost productivity. David, Lambert, and Toscani (2019) find that higher years of schooling is strongly associated with higher labor formality. There is also a strong negative correlation between informality and the World Bank's human capital index (Figure 12, panel 1), which captures both access to education and quality. As mentioned, LAC countries saw a large expansion in access in the 2000s, which was a key factor in reducing informality in Bolivia, Chile, and Colombia (IMF 2019), but the region still lags peers, especially high-performance EMs, in broader human capital measures (Figure 12, panel 2). Tackling the region's human capital gaps has become more urgent, as many of these challenges have been accentuated by the pandemic and by technological changes that disrupt production processes. Latin American countries endured some of the longest spells of school closures, and remote learning was severely hampered by poor internet connectivity. On average, students in the region lost, fully or partially, two-thirds of all in-person school days since the start of the pandemic, with an estimated loss of 1.5 years of learning (World Bank 2022). The pandemic is also accelerating the adoption of new technologies that require specific skills, such as technological and computer literacy, and could significantly disrupt labor markets in the region in the absence of additional good-quality educational gains.

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[23]Measures that increase the share of value added tax-compliant transactions that take place in the economy by, for example, leveraging on the use of electronic payment methods could help further foster formalization.

Figure 12. Higher Human Capital is Associated with Lower Informality Across Countries

1. Human Capital Index and GDP Informality

2. Average Human Capital Index in 2020, by Region and Income Group
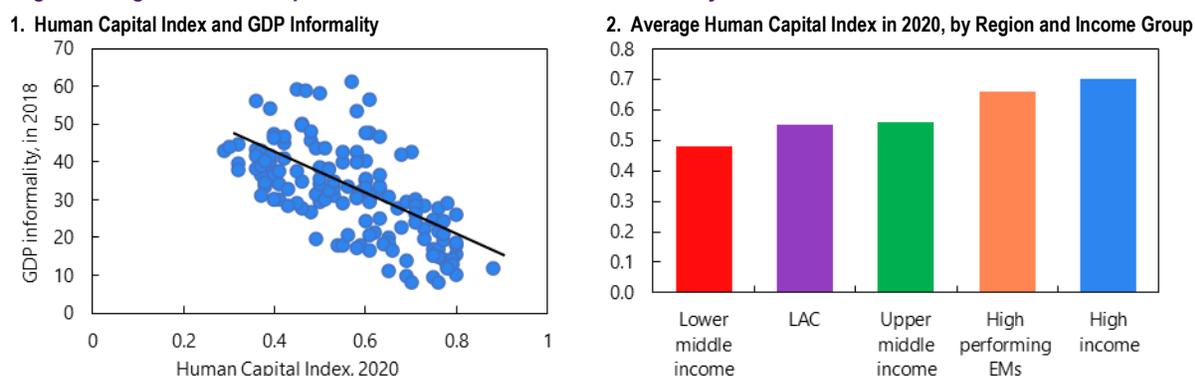

Sources: Ohnsorge and Yu (2022); World Bank; and IMF staff calculations.
Note: In panel 1, the human capital index calculates the contributions of health and education to worker productivity. The final index score ranges from zero to one and measures the productivity as a future worker of a child born today relative to the benchmark of full health and complete education. GDP informality is a model-based estimate of the share of a country's GDP that is informal in 2018. In panel 2, upper and lower middle-income groups follow the World Bank's income classifications. EMs = emerging markets; LAC = Latin America and the Caribbean.

Education policy needs to address LAC's current and future challenges. Efforts to recover and accelerate learning should be a priority. Policies should also aim at improving the quality of educational inputs, such as teacher quality, at all levels. Investment in digitalization could be critical to reduce the impact of the pandemic on the learning outcomes of vulnerable students. In the tertiary sector, countries in the region could benefit from increasing investment in vocational and technical training (see Organisation for Economic Co-operation and Development 2019; Ferreyra and others 2021). This could be particularly important to facilitate labor reallocations due to technological change and economic shocks (Beylis and others 2020). Training policies and greater digitalization can also help reduce gender inequalities that were exacerbated by the disproportionate impact of the pandemic on women's employment and income (Cucagna and Romero 2021). To address bottlenecks with labor skills, policymakers could improve the flow of information to prospective tertiary education students, for example by providing accurate information on the returns on different education degrees and on the labor skills needed by high productivity firms (Ferreyra and others 2017). This could help reduce dropout rates and address skill mismatches in the workplace.

Enhancing Resilience by Streamlining and Modernizing Labor and Business Regulations

Many countries in the region have rigid labor market regulations, featuring high and uncertain hiring and firing costs, that stifle firms' growth potential and hamper economic resilience. Employment protection legislation is particularly strict in South American countries, where firing and hiring are more rigid than in other regions (Figure 13), especially due to high severance payments and an inability to use fixed-term contracts (IMF 2019). Strict labor market regulations are associated with higher informality, lower economic flexibility to shocks and, in turn, lower labor productivity (IMF 2019). Rigid labor market regulations can also hamper incentives to innovate and adopt new technologies. For example, high dismissal costs could prevent firms' decisions to adopt the latest technologies because they may prevent employers from changing their workforce to keep

Figure 13. Latin American Labor Markets are Perceived to be More Rigid than Elsewhere
(Hiring and firing practices by country group; average; 1-7, 7=best)
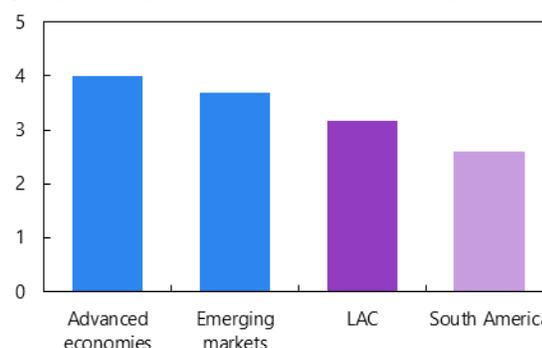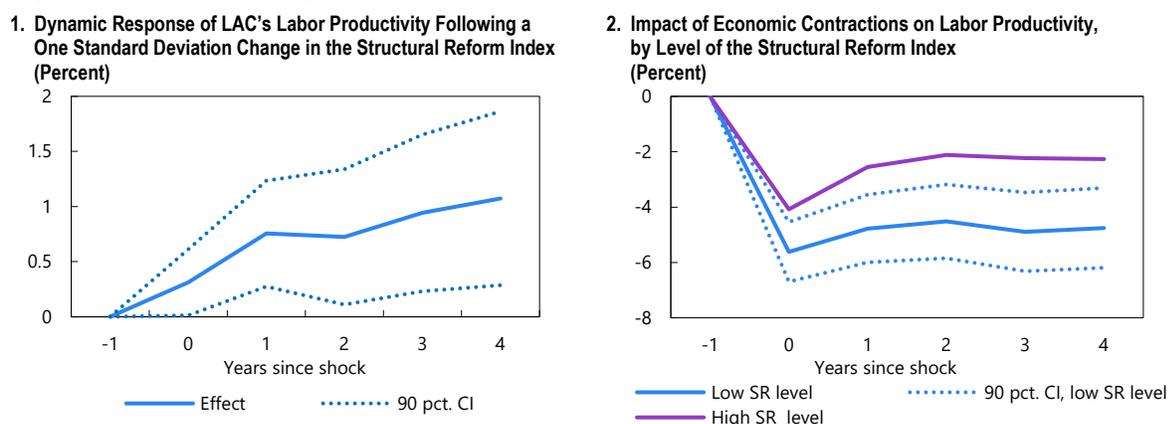

Sources: IMF staff calculations based on IMF 2019; and World Economic Forum.
Note: LAC=Latin America and the Caribbean.

14

up with a new technology. Strict employment protection legislation can also discourage firms from undertaking riskier activities, such as investments in innovation, because it increases downside costs (Dutz, Almeida, and Packard 2018).

Streamlining and modernizing labor market regulations by reducing rigidities should be part of the region's structural reform agenda to boost productivity. Policy changes that move in the direction of better functioning labor and credit markets, better product market regulation, and trade liberalization are associated with improvements in labor productivity and more resilience to economic downturns (Figure 14).[24] Moreover, as shown in David, Komatsuzaki, and Pienknagura (2021) and the October 2019 *World Economic Outlook,* these policies can lead to reductions in informality.

Firm entry and exit are also important dimensions of the business environment that affect productivity growth. Entrant firms bring new ideas into the market, while firms' exit, especially low productivity ones, frees up resources that can be used by more productive firms. Empirical evidence shows that lower entry costs are associated with higher productivity growth and investment (Nicoletti and Scarpetta 2003; Alesina and others 2005) and so are lower bankruptcy costs (Bergoeing and others 2002). Importantly, regulations that discourage entry and exit can also lead to slow productivity recoveries in the aftermath of shocks (Bergoeing, Loayza, and Repetto 2004), and, by discouraging competition and innovation, can exacerbate misallocation and hinder productivity (Fattal-Jaef 2022).

Figure 14. Better Functioning Labor and Product Markets Can Boost Productivity Growth and Enhance Resilience

1. **Dynamic Response of LAC's Labor Productivity Following a One Standard Deviation Change in the Structural Reform Index (Percent)**

2. **Impact of Economic Contractions on Labor Productivity, by Level of the Structural Reform Index (Percent)**

Source: IMF staff calculations based on David, Komatsuzaki, and Pienknagura (2021).
Note: Panel 1 shows the dynamic impact of a one standard deviation change in the SR index. Local projection also controls for past growth dynamics, fixed effects, and lagged values of the structural reform index. Panel 2: Impulse responses based on a local projection that controls for past growth dynamics, fixed effects, and includes a dummy taking value one if the country experienced a large economic contraction. The impact of the dummy is allowed to vary by the level of the structural reform index. CI = confidence interval; LAC = Latin America and the Caribbean; SR = structural reform.

Latin American countries have reduced entry costs faced by formal firms over time, but still underperform relative to other emerging markets (Lederman and others 2014). Moreover, Fattal-Jaef (2022) quantifies model-based entry costs and shows that in developing countries, including those in LAC, they may be larger than those measured in survey-based indicators. Differences may be attributable to the fact that entry costs in Fattal-Jaef (2022) capture all factors that affect firms' entry decisions, including costs of starting a business but also distortions that affect post-entry profits. Importantly, Alvarez and Ruane (2019), focusing on the case of Mexico, find that removing such entry barriers can yield significant aggregate productivity gains. The

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[24]The analysis builds on the IMF Structural Reform database, which is described in detail in Alesina and others (2020). This is a comprehensive dataset of structural reform regulation for a large sample of 90 developing and developed countries. This dataset is unique in terms of country-time coverage and in the breadth of the areas covered. The analysis focuses on reforms implemented in four broad areas: 1) domestic finance (credit controls, interest rate controls, entry barriers, supervision, privatization, and security markets development); 2) trade (based on average tariff levels); 3) product market (privatization, entry barriers, and supervision and regulation in two network sectors: telecommunications and electricity); and 4) labor market (focused in legislation regarding procedural requirements, firing costs, valid grounds for dismissal, and redress measures).

high levels of labor productivity dispersion observed throughout LAC (IMF 2018) suggest that similar gains could be attained by other countries should they reduce entry barriers.

Over the past 20 years, countries in LAC amended insolvency regimes to facilitate both the reorganization of illiquid but viable firms and the liquidation of unviable ones, with positive impacts on credit, investment, and productivity (Gine and Love, 2010; Ponticelli and Alencar 2016). Despite relatively successful reforms, more work appears to be needed in the region. Recovery rates after bankruptcy in LAC are still lower than in other emerging markets and insolvency costs are higher (World Bank 2020). Moreover, poor governance and judicial congestion limit the potential for productivity enhancements stemming from changes to bankruptcy laws by increasing the time to resolve insolvency (Ponticelli and Alencar 2016). In turn, low recovery rates, high insolvency costs and long insolvency resolution times act as ex-ante barriers to formal credit and risk-taking by firms and create ex-post incentives for the survival of inefficient firms. LAC countries also have insolvency systems that are in general less prepared to deal with high volumes of insolvencies sparked by economic crises relative to other emerging market and advanced economies (Figure 15).[25] Since lowering bankruptcy costs can help reduce the adverse effects of firm-level uncertainty on long-term growth (Acosta-Ormaechea and Morozumi, forthcoming), improving insolvency regimes in the region can also make LAC's economies more resilient to economic downturns.

Figure 15. LAC's Insolvency Systems are Less Prepared to Deal with Crises Compared to AEs and Other EMs
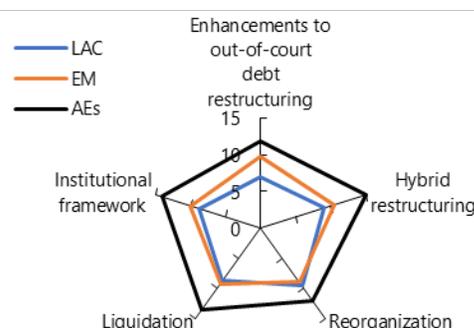
Source: IMF staff calculations based on Araujo and others (2022).
Note: The further away from the center, the higher the value of the sub-indicator. AEs = advanced economies; EMs = emerging markets; LAC = Latin America and the Caribbean.

Conclusions

Low productivity has historically hampered LAC's ability to improve its living standards in a sustainable way. Regulatory obstacles and deep-rooted institutional challenges make the region's productivity gaps with other emerging market and developing economies and advanced economies widespread and persistent. Moreover, the large economic and social dislocations caused by the pandemic have accentuated LAC's productivity woes and have raised the prospects of another "lost decade," as in the 1980s and 1990s.

LAC's productivity agenda should focus on building a more predictable and efficient business environment that incentivizes productivity-enhancing investments and labor/firms' formalization and facilitates efficient reallocations of resources in times of crises. LAC countries have reduced entry costs faced by formal firms over time. Nevertheless, burdensome and outdated labor and business regulations, along with complex and distortive taxation, are associated with less dynamic economies and higher informality. In turn, informality hampers productivity because informal firms are less productive than formal ones and because regulations create a wedge between them, weighing on the profitability of formal firms and their ability to implement productivity-enhancing investments. Thus, reforms such as strengthening the design of labor and capital taxation along with improvements in regulatory frameworks could lower compliance costs for formal firms and yield productivity gains (see IMF 2019 and IMF 2021). These reforms, coupled with the further

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[25]The insolvency indicator presented in Araujo and others (2022) offers an overview of the availability of legal tools and institutions that are helpful to conduct financial and operational restructuring of viable enterprises, as well as the liquidation of nonviable ones, in the context of a crisis, which typically requires extensive use of a variety of restructuring techniques while minimizing the use of scarce judicial resources. The indicator is constructed based on an analysis of five relevant dimensions of the insolvency and restructuring system: (1) enhancements to out-of-court restructuring, (2) hybrid restructuring, (3) reorganization, (4) liquidation, and (5) institutional framework. These five dimensions or sub-indicators provide an overall view of the preparedness of a country's insolvency system to deal with corporate crises.

strengthening of insolvency regimes, so that they do not excessively penalize failure and facilitate firm exit, could also foster productivity-enhancing reallocations.

LAC's ability to improve its medium-term economic outlook to achieve sustained and inclusive growth also hinges on a policy strategy that simultaneously tackles the side effects of the pandemic and the obstacles that have hamstrung LAC's business dynamism for decades. Part of the focus should be on reconstructing the region's human capital by undoing the large educational losses driven by the pandemic. This will be critical for the productivity agenda of the region, due to the important role that a skilled labor force plays in innovation and technological adaptation to better benefit from post-pandemic opportunities, such as the rise of automation and the digital economy.

To garner social support, LAC's productivity agenda should be complemented with policies that focus on employment retraining and ease transitions in the formal labor market. Strengthening safety nets that incentivize formalization and human capital improvements should play a key role. This would help make LAC's economies more resilient to economic shocks, the productivity agenda more durable, and its benefits more widely spread in society.

Box 1. Labor Productivity in the Aftermath of COVID-19: Evidence from Large Firms

The pandemic led to unprecedented disruptions in corporate activities. The impact has varied drastically by sector and by firms' characteristics. Various studies point to significant output and employment losses in contact-intensive industries in advanced economies (Famiglietti, Leibovici, and Santascreu 2020, for the United States; Industry Strategy Council 2020, for Canada).

Firms in Latin America and the Caribbean (LAC) followed similar patterns as those in North America, with those operating in contact intensive sectors suffering larger labor productivity losses.[1] Data from Bureau van Dijk's Orbis shows that LAC's firms in more contact-intensive sectors suffered a 33 percent contraction in labor productivity post-COVID-19 (Box Figure 1, panel 2), a larger contraction relative to that experienced by firms in similar sectors in North America (Box Figure 1, panel 1). By contrast, firms in other sectors saw positive labor productivity growth in LAC. For instance, high-tech firms benefited from rising demand for digital and telework technologies in response to social distancing restrictions and posted strong labor productivity growth, even higher than in the years preceding the pandemic. North American firms saw a qualitatively similar pattern, albeit with contact-intensive firms suffering a more moderate reduction in labor productivity.
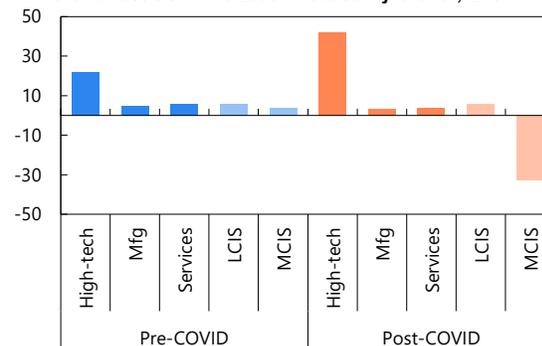
Box Figure 1. The Pandemic Hit Disproportionately Firms in Contact-Intensive Sectors, Both in LAC and in North America
(Percent)

1. **Pre- and Post-COVID Labor Productivity Growth, NA**
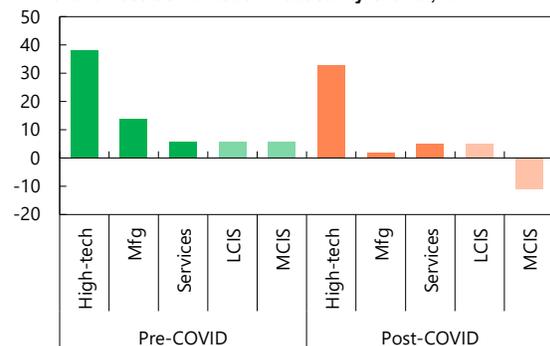
2. **Pre- and Post-COVID-19 Labor Productivity Growth, LAC**

Source: IMF staff calculations from ORBIS.
Note: LAC = Latin America and the Caribbean; LCIS = less contact-intensive services; MCIS = more contact-intensive services; Mfg=manufacturing, NA=North America excluding Mexico.

The nature of the pandemic and the stringency of containment measures explain the distinct growth paths of different sectors. On the one hand, policy measures are needed to support the recovery and mitigate COVID-19 scarring in contact-intensive sectors. On the other hand, accelerating the transition toward a digitalized economy, which promises to unlock considerable productivity improvements, is key to stimulating post-COVID-19 recovery, restoring productivity growth, and increasing economic resilience.

Note: This box was prepared by Yuanchen Yang.
[1]As in Andersson, Battistini, and Stoevsky (2021), the analysis defined contact-intensive industries as comprising accommodation, food, and transport services.

Annex 1. Data and Econometric Strategies

Macroeconomic Data and Analysis

Data Sources

Aggregate productivity analysis presented in the chapter relies on various data sources:

- Data on labor and total factor productivity and human capital are from the Penn World Tables, version 10.1.

- Data on informality are from Ohnsorge and Yu (2022).

- Data on policy and economic uncertainty comes from the International Country Risk Guide compiled by the PRS Group. The analysis used the International Country Risk Guide composite index which summarizes information on political, financial, and economic risk.

- Data on trade openness, measured as exports plus imports over GDP, are from the World Development Indicators.

- Data on GDP growth are from the IMF Word Economic Outlook Database.

- Data on Commodity Terms-of-Trade are from Gruss and Kebhaj (2019).

- Sectoral labor productivity and employment data are from Dieppe (2021).

- Data on structural reforms are from the IMF structural reforms database.

Total Factor Productivity Growth Regressions

To study the correlates of total factor productivity growth, the chapter estimates panel growth regressions. In particular, Figure 7 presents results from the following specification:

$$g_{i,t} = \alpha_i + \beta X_{i,t} + \varepsilon_{i,t}$$

where $g_{i,t}$ is total factor productivity growth of country i in year t, α_i is a country fixed effect, and $X_{i,t}$ is a matrix of controls that includes lagged GDP per capita (in logs), lagged values of a human capital index, the International Country Risk Guide composite index (a proxy for political/economic stability), trade openness (in logs), informality (in logs), lagged values of commodity terms of trade growth, and lagged values of the volatility of the output gap. The main text refers to relevant literature justifying the specification and the choice of these controls.

Local Projections

To study the response of labor productivity to (1) economic downturns and (2) changes to the structural reform index, we estimate a local projection model. The baseline specification at every horizon h between 0 and 4 is:

$$lp_{i,t+h} - lp_{i,t-1} = \alpha_i^h + \beta^h shock_{i,t} + \varphi^h X_{i,t} + \varepsilon_{i,t+h,}$$

where $lp_{i,t}$ is the logarithm of labor productivity in country i in year t, h is the horizon after the shock, which will take values 0 to 4, shock will be either an economic downturn (described in the following) or a change in the structural reform index (for details, see David, Komatsuzaki, and Pienknagura 2021). $X_{i,t}$ includes controls such as lagged labor productivity growth and lagged GDP growth (lagged values of the structural reform index in the case of the exercise in Figure 12). Standard errors in all cases are clustered at the country level.

The definition of economic downturn is as follows. These are years of negative GDP growth where two conditions are satisfied: GDP growth in the previous year was positive (so they are new downturns), and GDP levels remain at the pre-downturn level for at least one year after the beginning of the downturn.

Between/Within Decomposition

To study the contribution of between and within sectoral components to labor productivity growth, the chapter follows the decomposition proposed by McMillan, Rodrik, and Verduzco-Gallo (2014). In particular, labor productivity growth in country c, in year t can be expressed as:

$$g_{c,t}^{LP} = \sum_{s \in S} g_{s,c,t}^{LP} \, \theta_{s,c,t-1} + \sum_{s \in S} \frac{LP_{s,c,t}}{LP_{c,t-1}} \Delta \varepsilon_{s,c,t},$$

where s are sectors, $g_{c,t}^{LP}$ is the growth rate of labor productivity, $\theta_{s,c,t-1}$ is the share of the value added of sector s, in country c, at time t-1 in total value added at time t-1, $LP_{s,c,t}$ is sectoral labor productivity, and $\varepsilon_{s,c,t}$ is the share of sectoral employment in total employment.

The term $\sum_{s \in S} g_{s,c,t}^{LP} \, \theta_{s,c,t-1}$ is labeled the within component as it captures the contribution of within sector growth to total growth. The term $\sum_{s \in S} \frac{LP_{s,c,t}}{LP_{c,t-1}} \Delta \varepsilon_{s,c,t}$ is the between component, as it captures the contribution to total value-added growth of sectoral employment changes (scaled by the relative productivity of the sector that absorbs labor).

Similarly, the counterfactual exercises shown in the chapter use the following formulas. To calculate the increase in labor productivity from changes in labor allocation (C1 in the text), the following formula is applied:

$$\frac{\Delta LP_{C1}}{LP} = \sum_{s \in S} \frac{LP_{s,LAC,t}}{LP_{LAC,t}} (\varepsilon_{s,c',t} - \varepsilon_{s,LAC,t})$$

where c' is the country/country group used in the counterfactual (the average emerging market in this case).

Similarly, the increase in productivity from the second counterfactual is:

$$\frac{\Delta LP_{C2}}{LP} = \sum_{s \in S} \frac{(LP_{s,c',t} - LP_{s,LAC,t})}{LP_{LAC,t}} \varepsilon_{s,LAC,t}$$

Firm-Level Analysis

Data and Analysis

The World Bank Enterprise Surveys[1] poll a representative sample of formal[2] private firms in the non-agricultural sector. The analysis in this chapter focuses on surveys conducted under the Global Methodology, which has been implemented since 2006 and established a uniform methodology and core questionnaire for all countries. The survey relied on stratified random sampling and in our empirical analysis of regional patterns we incorporate sampling weights to have results that are representative of the associated population.

The World Bank Enterprise Surveys contain a rich set of information on firms' behavior and characteristics, including on performance, size, industry, investment in physical capital and innovation, access to credit and relationship with financial institutions, trade, international integration, and major obstacles to business

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[1]Source: World Bank Enterprise Surveys, http://www.enterprisesurveys.org
[2]The surveys target formal companies with five or more employees. Interviews are mostly conducted in the cities or regions that concentrate most of the country's economic activity.

operations as perceived by managers. For the econometric analysis, the chapter uses the following transformation of variables from the original surveys:

- Labor productivity is measured as the logarithm of total sales per worker (in 2009 US dollars).[3]

- A foreign exposure dummy incorporates information on whether the firm is an exporter or has foreign ownership. The foreign exposure dummy varies from zero, for firms that do not export and do not have foreign ownership, to one, for firms that either export or have foreign ownership.

- An innovation dummy incorporates information on whether the firm invests in research and development, has introduced a new product or process, or has an internationally recognized quality certification.

Indices of firm-level perceived obstacles are constructed as follows. From the list of 15 obstacles listed in the surveys, two classifications are created. The first splits obstacles into two groups, structural (8 obstacles) and regulatory (7), and creates an index ranging from 0 to 1 within each group. The index is the share of entries that the firm reports as major obstacles. The second classification further splits the list of obstacles into six categories: tax rates and tax administration (2); labor regulation, informality and business licensing (3); access to finance and barriers to trade (2); poor governance/high instability (4); labor force qualification (1) and infrastructure (3). A similar index as the one described previously is constructed for each of the six categories.

Regional Differences in Firm Characteristics

In the first part of micro-level exercise, we calculate the difference between firms in Latin America and the Caribbean (LAC) and firms in other emerging market and developing economies in a number of variables of interest (productivity, innovation, foreign exposure, perceived obstacles) by estimating the following equation:

$$y_{ict} = \beta_1 + \beta_2 LAC_{ic} + \beta_3 X_{ict} + \epsilon_{ict} \qquad (1)$$

where y_{ict} represents the dependent variable for firm i in country c at year t, LAC represents an indicator variable that is equal to one for all LAC countries, and X_{ict} represents a set of controls at the country and firm level, which includes GDP per capita, total investment as a percent of GDP, terms of trade, and informal output. At the firm level, we include controls for industry, size, investment in fixed asset and an indicator of whether the firm began operations after the global financial crisis. Annex Table 1.1 shows results for the regressions in (1).

Impact of Crisis

To estimate the impact of the global financial crisis on firm performance/characteristic, we estimate the following specification:

$$y_{ict} = \alpha_1 + \alpha_2 LAC_{ic} + \alpha_3 PostGFC_{ict} + \alpha_4 LAC_{ic} \times PostGFC_{ict} + \alpha_5 X_{ict} + \epsilon_{ict} \qquad (2)$$

where y_{ict} represents the dependent variable for firm i in country c at year t. $PostGFC$ represents an indicator variable that is equal to one for all years following the global financial crisis, LAC represents an indicator variable that is equal to one for all LAC countries, and $postGFC \times LAC$ represents the interaction between these two indicator variables. This specification allows us to evaluate how post global financial crisis productivity and other productivity-related variables differ from their pre- global financial crisis levels controlling for regional differences that are time invariant and including the possibility that the impact of the global financial crisis was heterogeneous for firms in LAC. Our coefficient of interest is the sum between α_3 and α_4.

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[3] We also remove outliers, firms with labor productivity above the 99th percentile, before calculating the logarithm of labor productivity.

Regression results from the impact of crisis analysis focus on countries that have conducted at least one enterprise survey before and one after the global financial crisis and concentrate on the behavior of firms in Latin America in comparison with firms in other emerging market and developing economies. We restrict the sample to include only the last survey conducted before and the first survey conducted after the global financial crisis. Annex Table 1.2 shows results for this exercise.

To evaluate the heterogeneity of the global financial crisis on labor productivity across the productivity distribution, the chapter estimates a quantile regression exercise akin to the specification in (2).

Annex Table 1.1. Labor Productivity and Firm-Level Characteristics
(LAC in comparison with other Emerging market and developing economies)

	(1) Labor Productivity	(2) Innovation Dummy	(3) Foreign Exposure Dummy	(4) Business Regulation Obstacles	(5) Structural Obstacles
Latin America & Caribbean Dummy	-0.306***	-0.035*	-0.072***	0.226***	0.187***
	(0.109)	(0.018)	(0.013)	(0.015)	(0.012)
Lagged GDP per Capita, US dollars	-0.000	-0.000***	-0.000***	0.000***	0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Lagged Total investment, percent of GDP	-0.004	0.007***	-0.002***	0.000	-0.002***
	(0.003)	(0.001)	(0.000)	(0.000)	(0.000)
Terms of Trade, Total, US Dollars	-0.004**	-0.000	0.001***	-0.002***	-0.002***
	(0.002)	(0.000)	(0.000)	(0.000)	(0.000)
Informal Output	-0.012***	-0.004***	0.000	0.004***	0.005***
	(0.002)	(0.000)	(0.000)	(0.000)	(0.000)
Firm Size, Medium	0.294***	0.158***	0.074***	0.009	0.015***
	(0.043)	(0.012)	(0.008)	(0.006)	(0.006)
Firm Size, Large	0.403***	0.310***	0.265***	-0.011*	0.001
	(0.050)	(0.013)	(0.012)	(0.006)	(0.006)
Firm Operations Began after the GFC	0.143**	0.153***	0.020	0.000	-0.013
	(0.064)	(0.019)	(0.014)	(0.009)	(0.009)
Firm Purchased Fixed Assets	0.264***	0.072***	0.024***	0.031***	0.046***
	(0.048)	(0.012)	(0.007)	(0.006)	(0.005)
Constant	11.527***	0.609***	0.238***	-0.188***	-0.049**
	(0.171)	(0.044)	(0.033)	(0.023)	(0.022)
R-squared	0.217	0.195	0.082	0.255	0.293
Observations	77359	95490	95490	95446	95480

Source: IMF staff calculations.
Note: This table presents results from the estimation of equation (1). Industry and income-level fixed effects are included in all specifications. Estimating sample includes surveys taken between 2006 and 2019. Final sample includes the following countries from Latin America: Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, Guatemala, Jamaica, Mexico, Peru, Paraguay, and Uruguay. It also includes the following EMDEs: Albania, Angola, Armenia, Azerbaijan, Bangladesh, Belarus, Bosnia and Herzegovina, Botswana, Bulgaria, Cambodia, Cameroon, China, Congo, Côte d'Ivoire, Egypt, Gabon, Georgia, Ghana, Hungary, Indonesia, India, Jordan, Kazakhstan, Kenya, Kyrgyz Republic, Malaysia, Mauritius, Moldova, Morocco, Myanmar, Namibia, Nigeria, Pakistan, Philippines, Romania, Russia, Senegal, South Africa, Sri Lanka, Tajikistan, Tanzania, Thailand, Tunisia, Türkiye, Vietnam, and Zambia. Regressions are weighted to incorporated sampling design and make results representative of the associated population (firms in the formal sector). EMDEs = emerging market and developing economies; GFC = global financial crisis; LAC = Latin America and the Caribbean.
Standard errors in parentheses.
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Annex Table 1.2. Labor Productivity and Firm-Level Characteristics

(Impact of firm-level characteristics on labor productivity)

	(1) Labor Productivity	(2) Labor Productivity	(3) Labor Productivity	(4) Labor Productivity
Foreign Exposure Dummy	0.347***			
	(0.013)			
Innovation Dummy		0.260***		
		(0.011)		
Business Regulation Obstacles			-0.065***	
			(0.022)	
Structural Obstacles				-0.105***
				(0.022)
Constant	10.783***	10.658***	10.837***	10.856***
	(0.055)	(0.056)	(0.055)	(0.056)
R-squared	0.207	0.205	0.200	0.200
Observations	77,359	77,359	77,343	77,354

Source: IMF staff calculations.

Note: This table presents results from the estimation of the relation between firm-level characteristics and firm's labor productivity. Industry, income level, and year fixed effects are included in all specifications. Estimating sample includes surveys taken between 2006 and 2019. Final sample includes the following countries from Latin America: Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, Guatemala, Jamaica, Mexico, Peru, Paraguay, and Uruguay. It also includes the following emerging market and developing economies: Albania, Angola, Armenia, Azerbaijan, Bangladesh, Belarus, Bosnia and Herzegovina, Botswana, Bulgaria, Cambodia, Cameroon, China, Congo, Côte d'Ivoire, Egypt, Gabon, Georgia, Ghana, Hungary, Indonesia, India, Jordan, Kazakhstan, Kenya, Kyrgyz Republic, Malaysia, Mauritius, Moldova, Morocco, Myanmar, Namibia, Nigeria, Pakistan, Philippines, Romania, Russia, Senegal, South Africa, Sri Lanka, Tajikistan, Tanzania, Thailand, Türkiye, Tunisia, Vietnam, and Zambia.

Standard errors in parentheses.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Annex Table 1.3: Post GFC Change in Labor Productivity and Perceived Obstacles
(LAC in comparison with other Emerging market and developing economies)

	(1) Labor Productivity	(2) Taxes rates and administration	(3) Labor regulation, informality and business licensing	(4) Access to finance and barriers to trade	(5) Poor governance / high instability
LAC Dummy	0.340***	-0.003	0.056***	-0.040***	0.023
	(0.087)	(0.024)	(0.014)	(0.015)	(0.018)
Post GFC Dummy	**0.014**	**-0.077***	**-0.015***	**-0.021***	**-0.069***
	(0.055)	**(0.011)**	**(0.008)**	**(0.011)**	**(0.009)**
Post GFC Dummy x LAC Dummy	**-0.192***	**0.152***	**0.104***	**0.088***	**0.164***
	(0.113)	**(0.030)**	**(0.018)**	**(0.022)**	**(0.022)**
Lagged GDP per Capita, U.S. Dollars	0.167***	0.016***	-0.001	-0.005***	-0.004***
	(0.006)	(0.001)	(0.001)	(0.001)	(0.001)
Lagged Total Investment, Percent of GDP)	0.015***	-0.003***	-0.001*	-0.000	-0.006***
	(0.004)	(0.001)	(0.001)	(0.001)	(0.001)
Terms of Trade, Total, US Dollars	-0.018***	-0.002***	-0.001***	-0.000	
	(0.001)	(0.000)	(0.000)	(0.000)	
Informal Output	0.007***	0.004***	0.002***	0.003***	0.003***
	(0.002)	(0.000)	(0.000)	(0.000)	(0.000)
Operations Began after the GFC	-0.179**	-0.014	-0.019*	-0.006	-0.037***
	(0.078)	(0.020)	(0.011)	(0.017)	(0.013)
Firm Purchased Fixed Assets	0.367***	0.001	0.019***	0.017*	0.027***
	(0.048)	(0.011)	(0.007)	(0.010)	(0.008)
Firm Size, Medium	0.423***	0.049***	0.008	0.034**	0.031***
	(0.052)	(0.012)	(0.008)	(0.014)	(0.009)
Firm Size, Large	0.544***	0.015	-0.008	0.010	0.011
	(0.075)	(0.014)	(0.008)	(0.012)	(0.011)
Constant	9.462***	0.350***	0.184***	0.105**	0.477***
	(0.226)	(0.046)	(0.028)	(0.041)	(0.034)
R-squared	0.293	0.081	0.050	0.025	0.111
Observations	48326	59366	60047	59675	59947

Source: IMF staff calculations.
Note: This table presents results from the estimation of equation (2). Industry fixed effects are included in all specifications. Estimating sample includes the last survey taken before and the first survey taken after the GFC for all countries in our final sample. Latin American countries in the final sample include Argentina, Bolivia, Chile, Colombia, Ecuador, Guatemala, Mexico, Peru, Paraguay, and Uruguay. EMDEs include Albania, Angola, Armenia, Azerbaijan, Bangladesh, Belarus, Bosnia and Herzegovina, Botswana, Bulgaria, Cameroon, Côte d'Ivoire, Georgia, Ghana, Hungary, Indonesia, Kazakhstan, Kenya, Kyrgyz Republic, Moldova, Namibia, Nigeria, Pakistan, Philippines, Romania, Russia, Senegal, Tajikistan, Tanzania, Türkiye, Ukraine, Vietnam, and Zambia. Regressions are weighted to incorporated sampling design and make results representative of the associated population (firms in the formal sector). Standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. EMDEs = emerging market and developing economies; GFC = global financial crisis; LAC = Latin America and the Caribbean.
Standard errors in parentheses.
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

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