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Peru

Building on Success

Boosting Productivity for Faster Growth



WORLD BANK GROUP

Report No. 99400-PE

PERU

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Boosting Productivity for Faster Growth



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Abbreviations

BCRP	Banco Central de Reserva del Perú	INEI	Instituto Nacional de Estadística e Informática
CAF	Corporación Andina de Fomento	IPR	Intellectual Property Rights
CEBB	Comisión de Eliminación de Barreras Burocráticas	LAC	Latin America and the Caribbean Region
CEDLAS	Centro de Estudios Distributivos, Laborales y Sociales	LACPOV	Latin America and the Caribbean Region WB poverty database
CENEC	Censo Nacional Económico	LHS	Left-hand Side
CEPAL	Comisión Económica para América Latina y el Caribe	LPI	Logistics Performance Index
CITE	Centros de Innovación Tecnológica Empresarial	MEF	Ministerio de Economía y Finanzas
CONCYTEC	Consejo Nacional de Ciencia, Tecnología e Innovación Tecnológica	MFN	Most Favored Nation
EEA	Encuesta Económica Anual	MIC	Middle-Income Country
ENAHO	Encuesta Nacional de Hogares	NBFI	Non-bank Financial Institution
EVA	Exports Value Added	NTM	Non-Tariff Measures
FIDEICOM	Fondo de Investigación y Desarrollo para la Competitividad	OECD	Organization for Economic Cooperation and Development
FINCyT	Fondo para la Innovación Ciencia y Tecnología	PISA	Programme for International Student Assessment
FOMITEC	Fondo Marco para la Innovación, Ciencia y Tecnología	PMR	Product Market Regulation
GCI	Global Competitiveness Index	PWT	Penn World Table
GDP	Gross Domestic Product	R&D	Research and Development
GFDD	Global Financial Development Database	REDES	Red de Ecología Social
GIPC	Global Intellectual Property Center	RHS	Right-hand Side
GMM	Gaussian Mixture Models	RIA	Results Impact Assessment
GVC	Global Value Chain	RICYT	Red de Indicadores de Ciencia y Tecnología
IDB	Inter-American Development Bank	SEDLAC	Socio-Economic Database for Latin America and the Caribbean
IMF	International Monetary Fund	STRI	Services Trade Restrictiveness Index
INDECOPI	Instituto Nacional de Defensa de la Competencia y de la Protección de la Propiedad Intelectual	SUNAT	Superintendencia Nacional de Administración Tributaria
		TFP	Total Factor Productivity
		WDI	World Development Indicators
		WEF	World Economic Forum
		WITS	World Integrated Trade Solution

Background and acknowledgments

This report has been prepared at the request of the Government of Peru, as part of the Road to Lima process leading to the Annual Meetings of the World Bank Group and the International Monetary Fund (IMF) in Lima, Peru, in October 2015. Other activities of the Road to Lima have been part of its preparation, as have intense technical consultations.

The report, by design, is focused on diagnosing selected microeconomic constraints to accelerating productivity growth, while acknowledging that the country may also have other development challenges that are not covered. The report also tries to provide policy directions with the same focused approach.

The report was prepared by a World Bank team led by Ekaterina Vostroknutova (GMFDR) under the guidance of Alberto Rodríguez (Country Director, LCC6C), Pablo Saavedra (Practice Manager, GMFDR), and John Panger (Director, GMFDR). It is based on 25 background papers written by multi-sectoral and multi-Global Practice (GP) and Cross-Cutting Solutions Area (CCSA) teams (a full list of contributors is in the Annex). The following team members led work on the specific topics and sections of the report. Leonardo Iacovone (T&C GP) led a team working on firm-level and productivity analysis that included Trang Thu Tran, Roberto Fattal, Reyes Aterido, and Siddharth Sharma. Thomas Farole (T&C JP and Jobs CCSA) coordinated the team working on trade-related issues, which included Sebastian Saez, Denisse Pierola, Ana Fernandes, Guillermo Arenas, Bruce Fitzgerald, and Erik Van Der Marel. David Robalino (Jobs CCSA) led the team working on labor market issues that included Elizabeth Ruppert Bulmer, Reyes Aterido, Dino Merotto, Mathilde Perinet, Angela Elzir, Tamara Arnold, and Adrian Garlati; the human capital section was based on inputs from Ines Kudo and Miguel Székely; Jennifer Keller was responsible for the corresponding section. Martha Licetti (T&C GP) and Donato de Rosa (MFM GP) led the work on competition and related regulatory policy issues; Alvaro Quijandria led the IFC team working on business regulation; Rong Qian was the main author of the corresponding section; this team included Lucía Villarán, Tanja Goodwin, Karina Rodríguez, Rachel Li Jiang, Congyan Tan, Ernesto Franco Temple, and Jessica Michelle Victor. The innovation section was produced by Rong Qian based on inputs from Ha Nguyen and Pluvia Zuniga; the team also included Patricio Jaramillo and Ekaterina Vostroknutova. The financial sector section was prepared by Daniel Barco (MFM GP) under the guidance and inputs of Steen Byskov (F&M GP). The macroeconomic and growth story was crafted by Ekaterina Vostroknutova and Faruk Khan drawing on inputs from Cristina Savescu, Daniel Barco, and Harry Moroz. Research assistance was provided by Melanie Laloum, Miguel Saldarriaga, and Teresa Peterburs. Administrative assistance was provided by Silvia Gulino and Patricia Chacon Holt. Writing and editing support was provided by Bruce Ross-Larson, Bruce Fitzgerald, and John Burgess.

The report has benefited greatly from comments, advice, guidance, and technical discussions with Norman Loayza, Augusto de la Torre, Daniel Lederman, Carlos Silva Jauregui, Jorge Araujo, Marcelo Selowsky, Ivailo Igvorski, Vinaya Swaroop, Edgardo Favaro, and many others. The report owes a lot to the government agencies that supported the team with provision of data, comments, guidance, and advice; the list includes but is not limited to the Ministry of Economy and Finance, the National Institute of Statistics and Informatics (INEI), the Central Bank (BCRP), Ministry of Labor, Ministry of Production, and Ministry of Trade.

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Executive summary

Growth with shared prosperity

Peru has emerged as a new growth star in the Latin America and Caribbean (LAC) region.

The economy surged at an average of 6.4 percent per year during the last decade, the second-fastest growth performance in the region. Over the same period, Peru doubled its per capita income, well ahead of the region as a whole, which increased this figure by only half. This has been an impressive performance by global standards as well (Box ES1).

The nation's economic growth has been widely shared among its 30 million people. Since 2000, almost a quarter of Peru's population has escaped poverty. Across the country, lower-income households—the bottom 40 percent—have gained more from growth than the national average: their per capita income rose by about 6.8 percent per year over the last decade, against a 4.4 percent average for the whole population. As with national growth, these gains were high by regional (and global) standards. Moreover, inequality plummeted during the period at one of LAC's fastest rates: 12.6 percent, against a 5.3 percent regional average. Importantly, growth was the main driver of reduced poverty and inequality through

improved labor incomes rather than redistribution policies—the latter explain only 15 percent of the poverty reduction.

These successes have been driven by strong macroeconomic and structural reforms over the last 20 years, and supported by highly favorable external conditions over the last decade. Beginning in the early 1990s, Peru adopted an ambitious mandate of reform. Macroeconomic stabilization included a more flexible exchange rate regime, inflation-targeting, fiscal discipline, and continued debt reduction. Structural reforms covered areas such as financial liberalization, trade, and product and factor market regulations (Box ES1). As a commodity exporter, Peru also benefited significantly from the commodity boom, particularly between 2004 and 2013.

Peru's convergence with higher income levels has accelerated. From the 1960s to the mid-1990s, convergence was slow, even negative at times. During that period other countries—including East Asian middle income countries (MICs)—continued converging, leaving Peru behind. But in the last decade Peru's income per capita has been catching up rapidly with those of high-income countries and—albeit from

Reforms and prosperity in Peru

In the early 1990s, Peru was caught in an economic and social crisis. Output had plunged by a quarter, public debt was ballooning, and ordinary citizens were struggling to survive amid hyperinflation that peaked at 7,650 percent. Aside from political and security measures, to confront these forces, Peru embarked on a deep and wide reform plan to target multiple institutions, systems, and practices—public and private. Indeed, few countries have attempted a shake-up so thorough.

Major accomplishments of the *First Round* of reforms, which promoted macroeconomic stabilization and efficiency of markets, included the creation of an independent central bank, with limits on how much it could lend to the public sector; a liberalized trade regime and a more flexible exchange rate regime; restructuring of external debt; lower food and utility subsidies; and the introduction of a framework for competition law. The pension system was also overhauled.

The beginning of the 2000s brought the *Second Round*, with the following basic goals: promotion of transparency and accountability in the macro-fiscal framework, creation of a fiscal stabilization fund and fiscal rules, and elimination of full-salary pensions for certain civil servants; control of inflation, by setting an inflation target and making decisions of

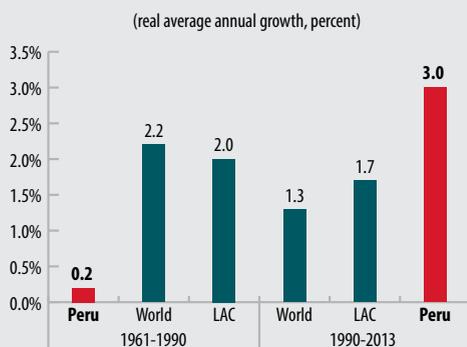
the central bank public; and expansion of international trade, through agreements with major trading partners.

The *Third Round* began in the mid-2000s with measures focused on strengthening human capital and fiscal reforms, through such steps as better career rewards for teachers, tax reform, and more accumulation options in the pension system; and closing gaps in infrastructure via, for example, multiyear targets and a framework for public-private partnerships (PPPs).

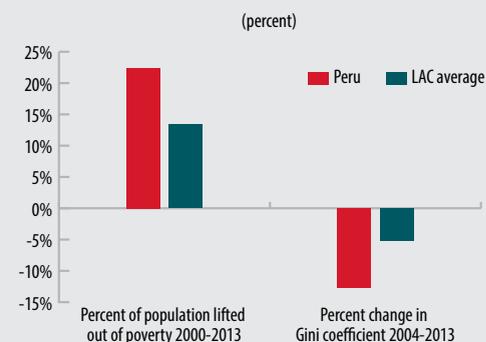
In 2014-15, and in the context of a strategy to cope with the slowdown in output, this round of reforms continued with measures that encompass lower business costs of entry, operation, and exit, including reducing red tape and simplifying taxes; initial measures to making the labor market more flexible; and a simplification of insolvency proceedings. This round also tackles some initial aspects of trade facilitation, including reducing tariffs for some intermediate goods and supporting firms to accredit and certify products in order to reach new export markets. It has also initiated regulations to accelerate a prudent implementation of PPPs.

There is no question that further reforms will be needed, but Peru can feel proud of its solid reform track record.

ES Figure 1. Reforms led to stellar performance in income per capita, relative to the region and the world



ES Figure 2. Growth cut poverty and inequality sharply



Sources: World Development Indicators (WDI) and Background paper prepared for this Report by Céspedes and Lengua-Lafosse (2015), Central Bank and Ministry of Economy and Finance of Peru.

a low base—is matching the convergence speed of other fast-growing MICs like Malaysia and Thailand. But as with other MICs, Peru now faces the hardest part—moving into high-income status.

Increasing productivity is the fastest way to boost growth, particularly without external tailwinds

In recent years, high labor participation and capital accumulation helped to fuel growth. The country achieved substantial labor accumulation, supported by a strong demographic dividend and high labor-force participation that reached 73 percent by 2013, higher than that in Malaysia, and Chile, and above the Organization for Economic Cooperation and Development (OECD) average. Capital accumulation was at the level expected for Peru's income per capita. There could also be significant gains by improving the quality of those inputs, as it is discussed later in this Executive Summary.

Peru saved the windfall of the commodity boom. Savings increased from just above 10 percent of Gross Domestic Product (GDP) in the early 1990s to 22 percent in 2014, driven by both private and public sectors. These helped finance a sharp increase in investment rates, well above regional levels. In that, Peru resembles most of the successful fast-growing MICs in East Asia, such as Korea in the 1990s. But it differs from regional comparators which consumed most of the commodity windfall and financed investment through foreign savings. Moreover, external savings that helped finance growth were mostly FDI, since Peru reduced its debt. These outcomes have made Peru more resilient and provided strong buffers to negative external shocks.

Despite sharp improvements, infrastructure gaps across sectors remain wide, and export diversification is narrow. For example, transport and logistics infrastructure—the backbone of domestic commerce and international trade—is less developed compared with that of peers and competitors. Road density coverage and percentage of paved roads are relatively low, offering limited connectivity between the most important agricultural, consumption, and export areas, and little capacity to link production to ports and airports. These obstacles impede the growth of exports, which remain relatively undiversified: five sectors (minerals, metals, vegetables, food, and textiles

and apparel) accounted for 91 percent of merchandise exports in 2014, virtually unchanged from 1994, with minerals having a significant share. In the context of a seemingly non-temporary adjustment in commodity prices, growth in high value-added manufacturing and services would help to support sustained growth.

Structural changes contributed to productivity growth in the last decade. Growth since the 1990s has been broad across economic sectors, with industry and services leading in the 2000s. Breaking down aggregate labor productivity (measured as value added per worker) into productivity growth within economic sectors and that due to structural shifts in employment shows that starting in the 2000s structural shifts contributed about 20 percent of overall productivity growth. Labor moving from agriculture to services was the principal source of labor productivity gains from structural shifts, although firm-level data indicate that the services sector has not been as productive as it could have been.

The large informal sector is a drag on labor productivity growth. While only 21 percent of GDP is produced informally by official estimates, by some measures 70 percent of workers are informal.¹ Labor productivity in informal sector is lower (in manufacturing it is only a quarter of its formal counterpart's), dragging down the whole economy's potential. High informality may also be a reflection of constrained productivity growth, which in turn means that job opportunities are not created in the formal sector at an adequate pace, and resulting in informality.

Recent growth has been increasingly driven by productivity gains, comparable to rates in other fast-growing MICs globally. Before the 1990s, growth was driven mainly by labor and capital accumulation, but over the last 15 years total factor productivity (TFP) contributed about a third of growth, similar to that in East Asian MICs, such as Thailand. Yet despite recent gains, Peru still suffers from large income and productivity gaps with high-income countries. Its output per worker is only 25 percent of that of the United States, and is somewhat lower than that of Chile and Mexico. While potential gains from increasing the capital stock, human capital, and labor are significant, a TFP increase would have the highest payoff for income per capita.

¹ There are many different forms of informal employment, including in the formal sector.

Against the backdrop of a less favorable external environment, growth will have to rely much more on productivity. Enhancing productivity growth is the fastest way to close the still-large income gap between Peru and high-income countries. For Peru, increasing TFP renders a larger growth dividend than for the average country in LAC: the region would only double its GDP per worker if it had U.S. levels of efficiency, while Peru would almost triple it.

Moreover, avoiding the “middle-income trap”, is a challenge that Peru can overcome by deepening reforms to spur productivity. The concept of MIC trap refers to the fact that transitions from low- to middle- income have been more frequent than those from middle- to high-income: of 101 MICs in 1960, only 13 had become high income by 2008. As in countries that avoided this trap, the policies that propelled Peru into upper middle-income status will not suffice to continue or accelerate the pace of convergence. The new engine of growth will be greater productivity, assisted by a suite of structural reforms. The past decade’s performance has laid the groundwork.

The rest of this Executive Summary examines Peru’s challenges and opportunities to boost productivity growth from a microeconomic perspective. Growth and convergence toward high income status require a number of important ingredients. The value-added of this report is in approaching the issue of growth and raising productivity from the firm-level perspective, using microeconomic data that has not been systematically analyzed in Peru and providing selected policy directions. This analysis uses primarily data of firms in the formal sector (accounting for roughly 80 percent of national output), while that of the labor market uses household and labor force survey which contain data on workers in the informal sector. Thus the findings have implications for the dynamics of the formal sector and the overall economy.

Peruvian firms’ productivity growth and the challenges ahead

Peru’s firm-level productivity is comparable to that of other MICs and has been growing fast, but it remains distant from the global productivity frontier. The country’s productivity at company level is on a par with that of similar MICs, such as Malaysia and South Africa. But the average firm in the country is only 5 percent as productive as the

global productivity frontier (defined as the top 25 percent of firms in the United States)—resembling the situation in Colombia (5.5 percent) and Mexico (8.5 percent). Like other successful countries in the region, Peru is closing the gap (by 11 percent between 2007 and 2011, for example).

There is a large dispersion in productivity growth among firms. Very different levels in productivity among firms are usually a first indication that markets do not channel factors of production to firms efficiently.² While firm level productivity heterogeneity is common, Peru is characterized by a high level of productivity dispersion vis-a-vis other countries in LAC and especially the United States. In Peru, firms in the 90th percentile of the productivity distribution are 500 percent more productive than those in the 10th percentile; this contrasts with around 200 percent in the U.S. Such disparities mean that some firms are able to produce much more given the same inputs, within the same industry. This disparity could be attributable to variations in technologies, processes, human capital, and managerial skills. But, more importantly, this is a sign of strong disparities in the allocation of factors of production, and a reason to look further into this issue.

There are also significant differences in firm productivity across geographic areas of the country. Firms in Lima have been, on average, more productive than those in the Sierra, Selva, and Costa regions. But firms in the Costa region have started to converge toward Lima’s productivity level more recently. This shows some potential for productivity catchup to raise aggregate productivity.

Not all subsectors contribute positively to productivity. The number of industries with negative TFP growth rates is higher in the services sector. In manufacturing, some subsectors, such as food manufacturing, have significant roles in raising aggregate productivity, while others, such as chemicals or metallic products in manufacturing and wholesale trade in services, have reduced it. These patterns contrast with those in other fast-growing countries, such as China, where almost all subsectors contribute positively to productivity growth.

² World Bank. 2014. “Latin American Entrepreneurs: Many Firms but Little Innovation,” World Bank, Washington, DC. <https://openknowledge.worldbank.org/handle/10986/16457>.

Unlike in other countries, larger firms in Peru are not more productive than smaller ones. In an environment where firms have access to appropriate inputs and output markets are efficient, productive firms can expand while less productive firms are likely to stay small or ultimately exit. Thus, the expectation would be to find older and larger firms that are more productive (as they have survived and grown) than their younger and smaller counterparts. This is the case in the U.S. and in dynamic MICs, such as Indonesia or Vietnam. Peru has only a small share of young firms: only 10 percent of firms are between 1 and 5 years of age, while two-thirds are between 6 and 19 years. The young and smaller firms, however, are more productive. This finding holds across sectors and geographic regions.

Firms grow slowly in Peru, and that may also be encouraging informality. In countries where input and output markets work more efficiently, firms that survive tend to enjoy rapid growth: in the United States, for example, old firms (40 years or more) are about eight times larger than young startups. Peru, however, shows evidence of stunted growth: old companies are, on average, only about twice the size of younger ones. This finding indicates that, beyond high costs of entry, the costs of operation are large and hamper firms' growth. Stunted growth in formal firms may also be encouraging the growth of the informal sector, as job opportunities are not created at the pace needed in the formal sector. Experience in other countries shows that reforms can substantially mitigate stunted growth. India, for example, shows a striking difference in firm growth before and after reforms that included privatization, improving licensing, and increasing efficiency of the trade system (which also boosted competition). These reforms are directed at improving factor allocation between firms.

These findings point to structural and market anomalies that tend to channel labor and other factors of production into less-productive firms. This phenomenon is referred to as "factor misallocation." Productivity may grow by increasing workers' output within a firm (*within-firm productivity*), or by employees (and capital) moving from less efficient to more efficient firms (*between firms productivity*). In Peru, while overall productivity grew at a good pace, it was driven by increases in *within-firm* productivity but was dragged down by inefficient allocation of factors of production between

firms. This misallocation effect is far stronger than in Mexico, Colombia, Slovenia or Hungary where similar analysis was carried out. A set of the "usual suspects" contribute to explaining this problem: labor market rigidities, lack of competition pressures and regulatory biases, issues with capital allocation, skill mismatches/deficiencies, among others.³

This problem of misallocation is concentrated in the services sector. Firm-level productivity grew in both manufacturing and services over 2007–12, but was markedly slower in services. In manufacturing, the allocation of factors between firms advanced from contributing negatively to positively, a critical trend that was likely driven by the country's increased trade openness and competition. But in services, the slower growth in productivity is explained by the high negative contribution from misallocation of labor between firms, as labor moved from more productive to less productive firms. Unlike manufacturing, the services sector has not seen any improvement in this trend over the last 15 years.

Misallocation in services is also hindering the growth of other sectors that rely on service inputs. Services—especially "other business services"—are an important input into other sectors, such as manufacturing. If services are overpriced or low quality due to poor allocation of resources, other sectors would tend to rely less on these external inputs and sub-optimally produce them internally in the firms (e.g., transport or professional services). This in turn hampers the productivity growth that comes from specialization, as firms would produce services outside their core competencies. The Peruvian services sector contributes only 4.8 percent of domestic manufacturing value added, much lower than that in Malaysia (20 percent), Thailand (17 percent), or South Africa (27 percent).

Overcoming the problem of misallocation through public policy is feasible and would render a large productivity dividend. Policy actions that remove distortions in factor, product, and intermediate goods and services markets can spur productivity, pulling up lagging industries and companies to national prevailing levels of productivity. In Peru, this could

³ Taxes can also be an issue. For more on taxation in Peru, see World Bank. 2015a. "Peru: Selected Issues in Fiscal Policy — Taxation and Equity." World Bank, Washington, DC. <https://hubs.worldbank.org/docs/imagebank/pages/docprofile.aspx?nodeid=24311031>

potentially increase overall productivity by up to 130 percent and double output per worker.

While acknowledging that productivity growth has many ingredients, the report focuses on selected opportunity areas to reduce the problem of misallocation and boost firms' productivity growth in Peru. It examines issues and opportunities in the areas of business regulation, labor-market policies, firms' access to low-cost financing, skills, trade, and innovation. In all these areas the focus is chiefly on constraints that lead to misallocation of resources or are strongly affected by it.

Enhancing competition pressures through regulatory reforms

Competition drives efficient resource allocation, but may be restricted by regulations that unduly obstruct firms' entry, operations, and growth. The small share of young firms in the market and stunted firm growth in Peru point to barriers to entry and exit, high costs of operation for existing firms, and overall potential barriers to competition pressures (e.g., growing firms placing pressure on larger/older ones).

Reforms in this area have helped in preceding decades, but progress needs to be reinforced and reforms deepened. The country now ranks as one of the LAC region's best reformers in global indexes that measure the business environment. Despite this progress, government bureaucracy and restrictive labor regulations remain as major constraints to doing business. Young, small, and medium firms are hit particularly hard. In a recent survey, nearly 30 percent of such companies identified business licensing and permits as a major constraint on their ability to expand and innovate. In 2014-15, the government has started to target these areas with a new wave of reforms that will need to be consolidated and continued.

Most barriers to competition stem from the implementation of the legal framework by sub-national governments and decentralized bodies. Weak implementation of existing regulations directly limits competition in sectors that matter most for local market development. Central and decentralized agencies and local governments, particularly at the municipal level, sometimes add rules outside the legal framework. They often fail to implement adequately national laws that would increase

competition pressures. For example in 2013, 10 out of 21 of the country's larger municipalities had no procedures in place to authorize the construction of telecommunications systems—limiting firms' ability to compete on network expansion in a crucial infrastructure for modernizing the economy as a whole. In the same year, Instituto Nacional de Defensa de la Competencia y de la Protección de la Propiedad Intelectual (INDECOPI), the government's agency tasked with fostering competition, found that 76 percent of complaints filed by businesses were attributable to local problems. The country has implemented some initial and positive measures in this direction recently.

Loosening rigidities in the labor market and strengthening skills

Inflexible and segmented labor markets can cause significant labor misallocations. For an economy to expand, it is vital that employers have the freedom to hire workers efficiently, rotate their duties, and slim down or expand their staffs to reflect market conditions. Workers need freedom and the tools to move from low- to high-wage jobs. Firms' growth and efficiency in the economy are compromised if labor rules restrict this movement and freeze companies and workers at subpar productivity and wages.

Restrictive dismissal regulations discourage employers from taking on new workers, unintentionally encouraging informality and hampering productivity. By some measures, Peru's informal sector now includes as many as 70 percent of all non-agricultural workers in the country, well above Mexico's 60 percent and Colombia's 54 percent. Peru ranked 12th among 15 countries of the LAC region in a recent Doing Business survey on the ease of hiring and firing. The fact that most workers are employed in the informal sector—outside labor regulations and unable to enjoy their benefits—suggests that overburdening labor policies are reducing their protection of workers by cutting the coverage of formal policies, contrary to the intended purpose of the established rules. Labor productivity levels in informal manufacturing, for example, are just a quarter of its formal counterpart's. Low productivity also translates into low pay for employees. Excessive labor regulations affect most sectors of the economy, but are especially detrimental in labor-intensive industries, such as services.

The country would do well to strike a better balance between worker protection and job creation. Labor regulations come up as a major reason for allocative distortions in nearly all areas analyzed: regulation, labor markets, trade, and innovation. In terms of adding flexibility and easing job mobility, hiring and firing regulations could be made less costly and employers given more discretion to approve lay-offs, whether collective or individual. Reducing the non-wage costs of labor—which in Peru are very high by international standards—is a key reform. A better balance would also encourage formal employment and thus expand coverage of workers' protection.

Skilled workers are a fundamental requirement for raising productivity and incomes. Although skilled workers are in growing demand in Peru, they remain in short supply. This is highlighted by the increasing labor income returns for people with 10–11 years of education compared to those with 7–9 years and those with only primary education. Further evidence shows that the quality of schooling is low—Peru has one of the lowest scores in math on the Programme for International Student Assessment (PISA). Public vocational training programs, which account for 30 percent of continuing training, underinvest in equipment and often fail to give graduates the skills that the labor market is seeking. Improving these outcomes would require higher public spending on education and training, which remains low despite recent improvements as well as involve better matching of vocational training to the needs of the private sector.

Improving access to and quality of finance for small and medium enterprises

Improving access to efficiently priced finance can facilitate firms' expansion and technology adoption, contributing to productivity growth. An efficient financial sector is central to productivity growth because it connects savers and borrowers for credit access and capital accumulation, and it can contribute to better resource allocation in the economy. Although the country's savings rate is relatively high, many Peruvians do not save in formal financial institutions. An estimated 29 percent of the population have savings accounts, lower than in Bolivia (36 percent), Colombia (35 percent), and Ecuador (51 percent). Instead, people save their cash at home or through such traditional methods such as purchasing property or livestock. These patterns

tend to perpetuate a cash economy with its myriad inefficiencies. Political commitment to improving access to finance has been demonstrated by the recent adoption of a national financial inclusion strategy.

The total volume of bank credit is low and the loan-to-deposit interest-rate spread is high. Although many firms report using credit, total credit volume is well below what the income level of the country and stable economic conditions would predict. Banking concentration and return on equity are high in Peru relative to the rest of region, although competition has stiffened in recent years (the number of banks increased from 11 in 2006 to 17 today, and return on equity decreased from 30 percent in the late first decade of the 2000s to just above 20 percent in 2014). These factors, together with the still-high spread between loans and deposit rates, suggest room to increase competition further (but more analysis is needed to confirm this view).

The cost of credit for small and medium firms is relatively high, and access to finance shows geographic variation. Peru ranks well in access to credit in most cross-country rankings (e.g., Doing Business). However, the cost of credit is thought to be high, especially for small and medium firms. For micro firms with access to the financial sector, the annual cost of credit was above 30 percent of the loan amount in 2014. Although measurement is difficult, there is evidence that effective borrowing rates are high for informal firms outside the formal financial system. For the financial system as a whole, the average lending rate was 16 percent in 2013, which is high compared with other economies at similar levels of development. Given that large corporates can obtain credit at very low and competitive rates, smaller and medium firms' costs of borrowing must be high to lift the average rate to that level. Geographically, 85 percent of firms in Lima have bank loans, but in the city of Arequipa—where the penetration of the financial system is similar to that in Lima—the figure is only 47 percent.

The last two sections of the Executive Summary explore further opportunities to reduce misallocation of factors in areas that are typically examined in the context of within-firm productivity growth. Indeed, performance in the areas of international trade and innovation is strongly affected by misallocation, and

therefore large productivity gains could come from improvements in these areas.

Expanding foreign trade

International trade can help reduce the misallocation of resources and foster productivity. Exposure to export markets has provided strong competition pressures, as shown by the progress in reducing the misallocation of resources in Peruvian manufacturing over 2007–12.

Peru should be commended for having one of the world's most liberal trade regimes, yet it trades very little. Peru's total exports are low (22.4 percent of GDP in 2014) relative to other countries at similar income levels. Despite some impressive successes in exporting fruits, vegetables, and apparel, Peru has weak ties to global value chains, the international networks of companies that team up for sequential production in different countries to bring high-value products to world markets.⁴ Peru's role in these chains is mainly as a supplier of low-value primary inputs (e.g., minerals).

Higher value-added traded goods and services are a large opportunity for Peru. In addition to small trade volumes overall, so far, Peru has done little to adapt to the more sophisticated services that are expanding their share of global exports. Services also provided little support to other exports, compared to other MICs. The value added of services in total exports in Peru is only about 20 percent, compared with 30–40 percent in Thailand, Malaysia and South Africa. To support exports in higher value added products requires improving infrastructure for trade and logistics, and behind-the-border issues. High costs of trade logistics amount to about 32 percent of product value in Peru, one of the highest levels in Latin America—above Colombia's (23 percent) and Chile's (18 percent) for example—and far higher than the OECD average of 9 percent. Some key elements that should support this agenda are in fact going the wrong way: in customs, Peru's Logistics Performance Index ranking has declined markedly, from 49th to 96th.

These findings suggest that reforms can have a substantial impact. Easing domestic constraints such

as labor regulations and behind-the-border barriers (e.g., improving customs and trade facilitation) would encourage domestic and foreign companies to start export projects. Improvements in trade and logistics infrastructure could reduce the large sunk costs that firms need to undertake to be able to export, encouraging smaller firms to innovate, trade and grow. Building more tailored skills that can be used in higher value-added manufacturing and services industries is important as well. A more robust innovation environment, as discussed below, would also facilitate diffusion of GVC-acquired knowledge and improve downstream links for exporters.

Helping companies innovate

Shortcomings in the innovation system perpetuate inefficient factor allocation. For example, in Peru small and young firms are more productive, but if they have less access to inputs such as finance, or if their innovations are not well protected, overall productivity growth is likely to suffer. Thus, beyond assuring general preconditions for innovation—high-quality education, investment in research and development,—the government may need to help firms tackle more specific obstacles.

In Peru, firms invest too little in innovation. Peruvian firms invest on average 2.5 percent of their sales in innovation, whereas their peers in Chile invest 3.5 percent. Moreover, technology adoption (acquired through licenses of new technology and imported capital goods), which is a straightforward way to move closer to the innovation frontier, is scarce. Only 7 percent of Peruvian firms have licensed technology from abroad, half the LAC region average and 2.5 times less than in OECD countries.

Peruvian firms that do invest in innovation are more likely to introduce new products, but low returns to innovation (sales) may be contributing to low investment. If a Peruvian firm spends on innovation-related activities, it is more likely to introduce a new product or new process than firms in other LAC countries. But Peruvian firms that introduce new products or processes have an average of only 38 percent higher sales per employee, compared to about 100 percent in five other surveyed countries of the region.

Small and young firms seem to have less access to innovation support than larger ones, reinforcing

4 World Bank. 2015. "Latin America and the Rising South: Changing World, Changing Priorities." <https://openknowledge.worldbank.org/handle/10986/21869>.

poor allocation of labor and capital. The average age of firms that innovate is 22 years, five years older than the average age of firms that do not. The average number of employees of innovating firms is 75 percent higher than in other firms.

Public policy could help improve the innovation system. Enabling better use of knowledge entails improving governance and legal enforcement environment for institutions and companies to engage in innovative ventures. The expansion of agencies that diffuse existing technology from abroad to local firms, particularly small and medium firms, could help boost productivity. Opening the research and university system to various forms of knowledge transfer and to collaboration with the private sector would also be helpful.

Conclusion

A third of Peru's economic growth has been driven by improvements in productivity, but in the next stage of convergence, and under the new external conditions, a larger contribution to economic growth will have to come from productivity. The country emerged as one of strongest growth performers in the region and accelerated its convergence to higher income levels. Although the country's productivity growth at the company level is at par with similar middle-income countries that aspire to avoid the middle-income trap, the gap to the global productivity frontier remains large. This report shows that enhancing productivity growth remains the fastest way to close it. There is strong firm-level evidence that Peruvian markets tend to misallocate labor and capital into less productive workplaces. This signals that some aspects of product, factor, and intermediate goods and services markets do not function properly. The country's services sector is a poor performer in this regard. Eliminating these distortions could increase overall productivity by up to 130 percent and double Peru's output per worker. But that in turn requires deepening reforms in selected areas.



Introduction

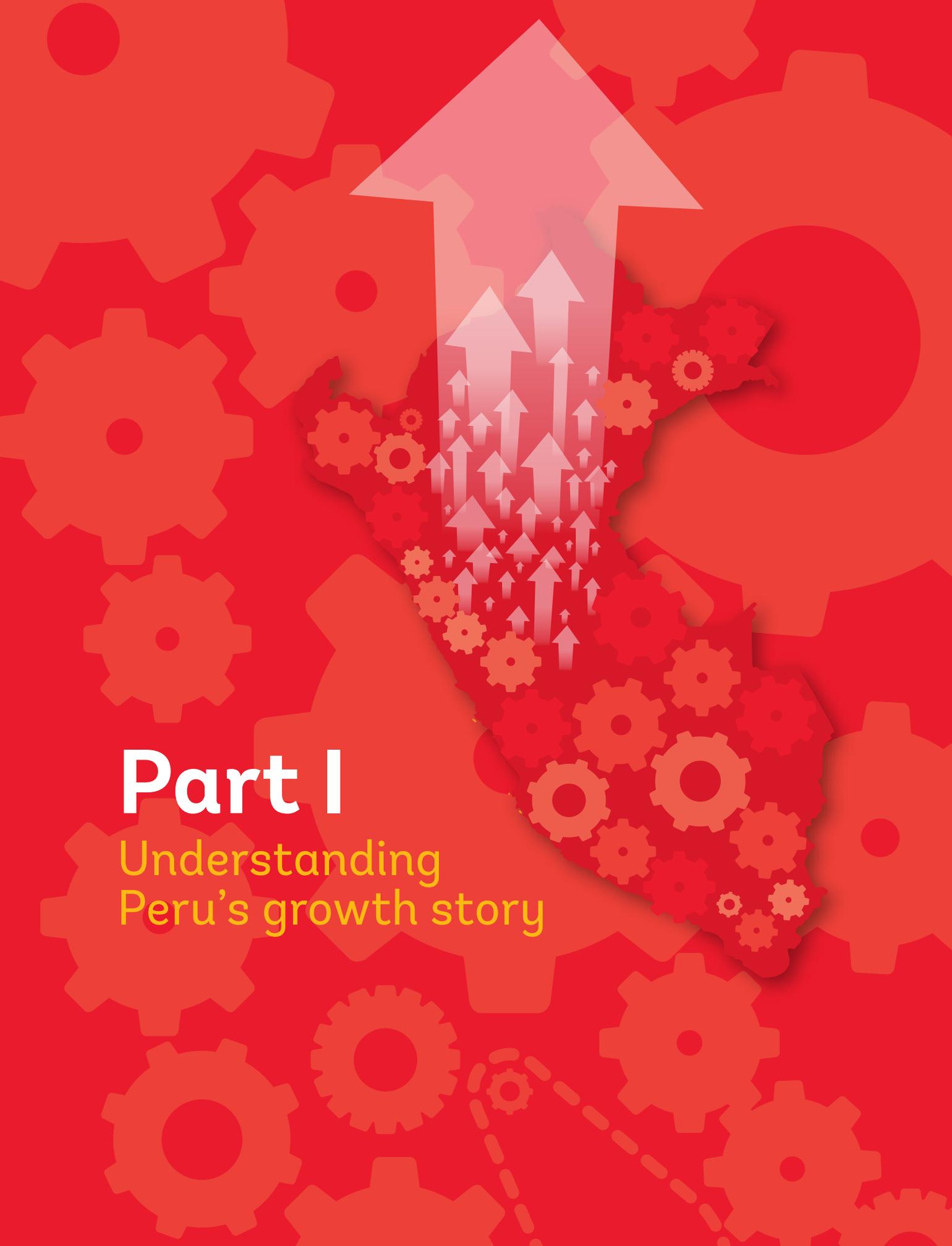
Peru's recent robust growth has raised its economic prospects and has been broadly shared. Peru grew slowly from the 1960s through the end of the 1990s. But the defeat of terrorism and a series of far-sighted reforms raised its growth rate above regional and world averages in the 2000s. During the last decade, the economy grew at an average rate of 6.4 percent per year. The growth translated into higher incomes, and lower poverty and inequality. Peru has been consistently among top regional poverty and inequality reducers: poverty was more than halved over the last decade, while inequality fell by 12 percent between 2004 and 2013. As a result, the country reached upper-middle-income status in 2008 and is now seeking to join the Organization for Economic Co-operation and Development (OECD).

The next step in development—high-income status—is challenging for all middle income countries and requires sustained growth. Peru would need to maintain an average 6.5 percent growth rate over the next 15 years to reach high-income status. Many countries develop rapidly to reach middle-income status but few take the next step to high-income status: of 101 middle-income countries (MICs) in 1960, only 13 had become high income by 2008. Most of these successful countries adopted policies that spurred productivity. The policies that propelled Peru into upper-middle-income status are not those that will take it to the next level.

Raising productivity growth is key to sustaining Peru's high growth rates of income per capita, including in the context of a less favorable external

environment. Rising above middle-income status is a policy challenge for all MICs. Strategic shifts are usually needed to move the economy from growth driven by accumulation of factors to productivity-based growth. As factor accumulation slows, an economy that adapts by increasing productivity is more resilient. Productivity is an important determinant of differences in incomes across countries, and productivity growth is the ultimate long-run driver of economic growth. But if productivity growth is moderate and growth is driven principally by an accumulation of capital and labor, economic growth is likely to taper as returns to such factor accumulation diminish.

This report looks at Peru's principal challenges and opportunities to maintain strong and inclusive growth through higher productivity. Success would require it to boost productivity by further improving conditions for firms' growth through lower costs of entry and operation, higher completion and, through that, an improved factor allocation to productive firms. It would also require a reduction of inefficiencies by reaping more benefits from international trade and an improved innovation framework. The report has five parts. Part I analyzes the sources of Peru's recent strong growth. Part II examines more closely the dynamics and challenges to Peruvian firms' productivity growth. Part III analyzes elements that would increase the efficiency of Peru's labor and capital resources—regulation, labor markets, and human capital. Part IV is focused on further opportunities to reduce misallocation while at the same time speeding up within-firm productivity through expanding Peru's technological possibilities, particularly through innovation and the spillovers from international trade.



Part I

Understanding
Peru's growth story

1. Peru's growth success

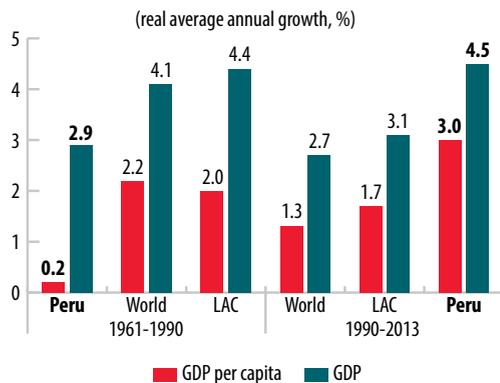
The country showed a strong drive to reach a middle-income status, with prosperity broadly shared

Over the last 12 years, Peru has doubled its real per capita income. Peru grew more slowly than the world and regional averages between the 1960s and the 1990s. But after defeating terrorism and adopting a series of macroeconomic stabilization and structural reforms in the 1990s and 2000s, it saw growth rates of GDP and income per capita accelerate, exceeding those of

comparators (Figure 1). Peru grew at an average of 4.5 percent per year during 1990–2013 (compared to regional and global growth of around 3 percent), and at an even faster average rate of 6.4 percent during the last decade. As a result, Peru doubled its GDP and per capita income in the last 12 years, while the Latin America and the Caribbean (LAC) region increased them only by half.

Growth has been widely shared, placing Peru among the fastest poverty and inequality reducers in the region. Low-income households have gained more

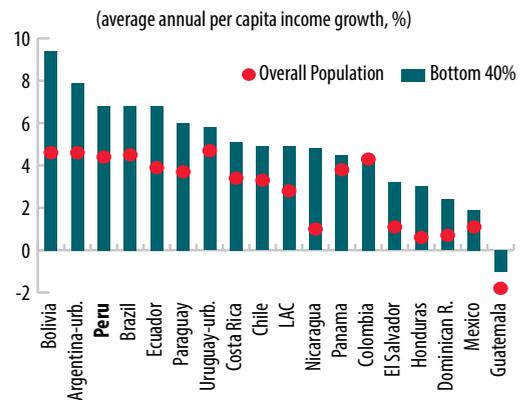
Figure 1. Peru has seen fast per capita and aggregate GDP growth over the past quarter century, relative to the region and the world



Source: WDI.

Note: Annual percentage growth rate of GDP at market prices and GDP per capita based on constant local currency. GDP per capita is gross domestic product divided by midyear population. Aggregates are based on constant 2005 U.S. dollars.

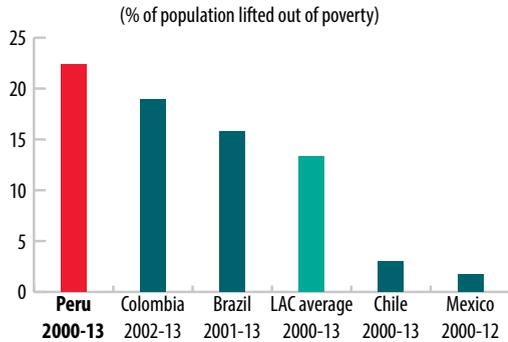
Figure 2. Growth was broadly shared



Source: Socio-Economic Database for Latin America and the Caribbean (SEDLAC) and WDI.

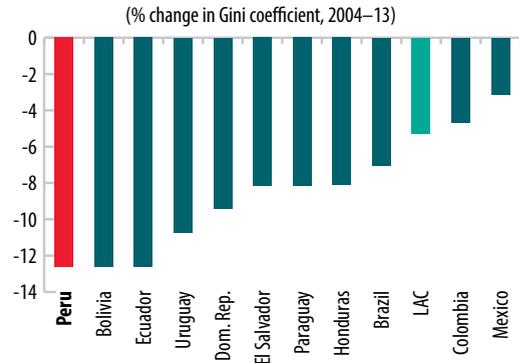
Note: 2003–13, except for Bolivia (2002–13), Argentina, Peru, and El Salvador (2004–13), Costa Rica (2003–08), Nicaragua (2005–09), Panama (2008–13), Mexico (2002–12), and Guatemala (2000–11).

Figure 3. Poverty reduction was better than in other LAC's inflation-targeting countries



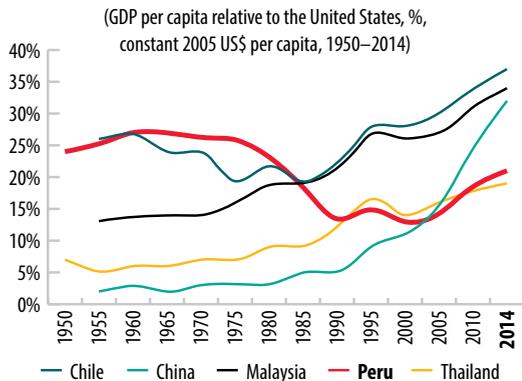
Source: Authors' calculations based on data from INEI, Comisión Económica para América Latina y el Caribe, (CEPAL).

Figure 4. Peru was among the fastest inequality-reducers in the region



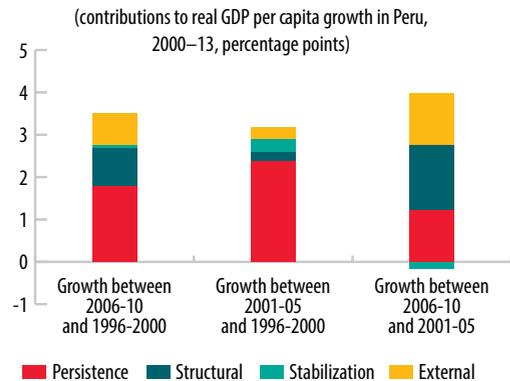
Source: LAC Equity Lab tabulations of SEDLAC (Centro de Estudios Distributivos, Laborales y Sociales, CEDLAS and the World Bank) and World Development Indicators (WDI).

Figure 5. Having lagged behind other MICs since the 1970s, Peru is now firmly on the path of convergence to high income per capita



Source: Authors' calculations based on Feenstra et al. (2015): Background paper prepared for this report by Moroz and Vostroknutova (2015). Note: This figure uses Penn World Table (PWT) 8.1 and WDI.

Figure 6. Structural and stabilization variables have had a stronger impact on growth in Peru



Source: Authors' calculations: Background paper prepared for this report by Savescu and Vostroknutova (2015), based on Araujo et al. (2015a) and the National Accounts data by INEI, BCRP, Ministerio de Economía y Finanzas (MEF), and WDI.

from growth than the national average. Between 2004 and 2013, real income per capita of the bottom 40 percent grew at an average 6.8 percent, above the 4.4 percent national average. These gains were high by regional standards (Figure 2). They helped Peru to reduce poverty from 63.4 to 29.3 percent of the population.⁵ In 2013 alone, almost 500,000 people were lifted out of poverty. Peru reduced poverty faster than other countries with similar income levels and macroeconomic policy stances (Figure 3). Income inequality, measured by the Gini coefficient, is still high but fell from 0.49 in 2004 to 0.44 in 2013,

making Peru one of the most successful countries in the region, although some geographic and urban-rural disparities remain (Figure 4). Importantly, growth was the main driver of lower poverty and inequality through improved labor incomes: 85 percent of poverty reduction between 2004 and 2010 is explained by this factor. Redistribution policies only account for 15 percent of that reduction.⁶

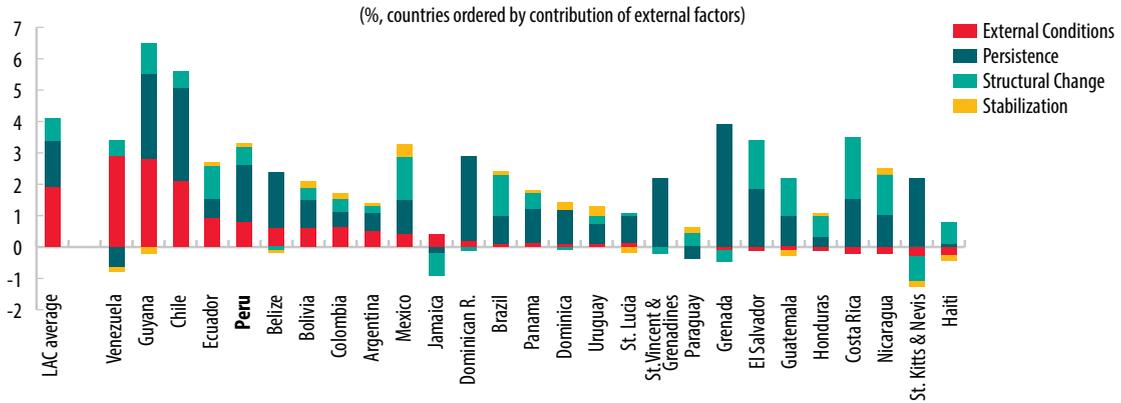
Peru's convergence with higher income levels has been accelerating over the last decade. From the 1960s to the mid-1990s, convergence was slow (or even negative). During that period several comparator countries continued their convergence, leaving Peru

5 The national poverty line is the cost of a minimum basket of goods (including food) and services (NS292 per month per person in 2013), while the extreme poverty line is the cost of a minimum food basket (NS155 per month per person in 2013).

6 Inchauste et al. (2012).

1. Peru's growth success

Figure 7. Predicted contributions to growth from stabilization, structural change, external conditions, and persistence: Changes in per capita GDP between late 1990s and late 2000s



Source: Araujo et al. (2015a).

Note: "Late 2000s" stands for 5-year average, 2006–10, and "late 1990s" stands for 5-year average, 1996–2000.

behind (Figure 5). Yet, in the last decade Peru's income per capita has been converging rapidly with that of the high-income countries and—albeit from a low base—is matching the convergence speed of other fast-growing MICs like Chile, Malaysia, and Thailand. But as with other MICs, Peru now faces the hardest part—moving into high-income status.

Strong growth over the last two decades was the result of macroeconomic stability, structural reforms, and favorable external conditions. As in any commodity-exporting country, growth in the late 2000s relative to the late 1990s was significantly supported by favorable external conditions (Figure 6). However, it also benefited from a wave of structural reforms initiated in the 1990s (Box 1). Structural and external factors contributed an estimated 0.8 and 0.7 percentage points, respectively, to growth annually, thus explaining 25 and 21 percent of the 3.5 percent annual growth over this period. Growth in the early 2000s shows high contribution from "persistence"—the likely lingering positive effect of past macro-structural reforms. Growth from 2005 onward shows a larger contribution of structural factors and the highly favorable external environment (Figure 7).⁷

7 The graph depicts System Gaussian Mixture Models (GMM) estimations of a differences equation ($\Delta \ln y_{i,t} = \theta(\Delta \ln y_{i,t-1}) + \Gamma \Delta \ln(X_{i,t} + \Delta b_{i,t} + \Delta e_{i,t})$) of contribution to growth of a set of variables grouped in four categories: structural variables combine schooling, private credit/GDP, trade openness, and infrastructure (telephone lines), government consumption, and institution quality; stabilization variables include inflation, and a proxy for exchange rate misalignment, and the banking crisis dummy; external conditions are captured by terms-of-trade growth, growth in (country-specific) commodity prices, and time dummies (capturing global effects such as liquidity); and a growth-persistence parameter

Much of the rest of this report diagnoses the selected challenges faced to achieve sustained growth through higher productivity, and provides options for overcoming them and enabling Peru to continue its path to high-income status. The fundamental premise is that Peru will have to increase productivity—obtaining greater output from its resources—and better align its economic incentives with international best practices. This involves increasing the efficiency with which the economy employs its resources.

captures the effects of past shocks and interventions, which is introduced by the lagged dependent variable. In this formulation, the coefficient for the persistence term likely incorporates the effects from past stabilizations and structural reforms.

Reforms and prosperity: A quarter century of reforms in Peru

At the beginning of the 1990s, Peru was in turmoil. Between 1987 and 1990, output fell by 25 percent, the average public deficit for the period was more than 8 percent of GDP, and hyperinflation reached 7,650 percent. Public debt was in arrears and the stock of international reserves barely reached 2 percent of GDP. Price controls had introduced large distortions into the structure of relative prices, and the parallel-market exchange rate reached five times the official rate.

First Round of reforms

Against this backdrop, an ambitious policy package was implemented in the early 1990s to promote macroeconomic stabilization and support the operation and efficiency of markets. The main policies included central bank independence and limits on the financing it could provide to the public sector; liberalization of the multiple exchange rates system and adoption of a managed float regime; removal of food subsidies and reforming the pricing of public utilities; simplification of the tax system by reducing the number of taxes and exemptions; and restructuring of the external debt owed to official and private creditors.

Reforms that fostered the functioning and efficiency of markets included opening up to international trade, via unilateral reduction of tariffs and other barriers to imports and exports, as well as the elimination of

state monopolies in food imports. Financial liberalization entailed eliminating controls on interest rates, creating a credit bureau, implementing the Deposit Insurance Fund, strengthening banking supervision and regulation, and restructuring and privatizing most state financial institutions. Labor reforms saw reduced dismissal costs through replacing absolute job security with protecting against arbitrary dismissal, and relaxing wage determination, rules on working hours, and types of employment contracts. Deep pension-system reform and creation of regulatory agencies in telecommunications, energy, and transport completed the package.

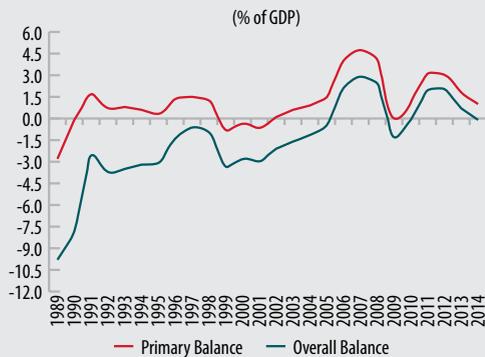
These policies boosted confidence, helping lift GDP growth to around 4 percent between 1991 and 1999. The public deficit was reduced to below 1 percent of GDP between 1997 and 1998 and inflation fell to single digits toward the end of the decade.

Second Round of reforms

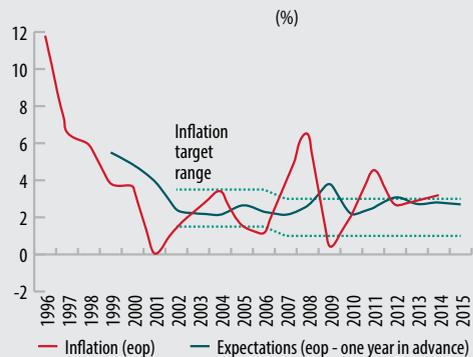
During the 2000s, reforms were mainly oriented to consolidate and deepen the gains in macroeconomic stability and efficiency in the functioning of the public sector. They were based on three axes:

- *Developing a macro-fiscal framework, with laws that promote transparency and accountability in managing public resources.* These included

Box Figure 1. Fiscal results



Box Figure 2. Inflation-targeting regime as a tool to anchor inflation expectations



Reforms and prosperity: A quarter century of reforms in Peru (cont.)

incorporating quantitative fiscal rules to limit public spending; creating a fiscal stabilization fund, which allowed public resources to be saved in years of high growth for use during recessions through temporary expansion of public spending; switching to results-based budgeting, which linked budget planning with measurable objectives to boost efficiency of public spending; and abolishing the *cédula viva* regime, in which a group of former civil servants received a full-salary pension on retirement.

- *Adopting an inflation-targeting regime*, to anchor inflation expectations via an explicit inflation target. In addition, decisions of the central bank were made public.
- *Deepening international trade links*, through trade agreements with main trading partners.

These reforms had a positive impact on economic outcomes. In 2000–09, the average public deficit was reduced to around 0.5 percent of GDP and public debt fell to 27 percent of GDP. Inflation targeting anchored expectations within the target range.

Third Round of reforms

In the late 2000s and the beginning of this decade, the reforms focused on:

- *Strengthening human-capital development and public sector*. Healthcare reform emphasized new remunerative and management systems; education reform increased budgetary allocations for improvements in teaching careers, learning systems, and infrastructure; civil service reform created the SERVIR program to manage human

resources in the public sector, and introduced clear definition of roles, career development, and pay scales for public servants.

- *Tax and pension reforms*: These were geared to start bringing the tax system closer to OECD standards; and pension-system reform included more accumulation options.
- *Closing gaps in infrastructure*: This included defining multiyear targets at the sectoral level; and developing a framework for public-private partnerships (PPPs) and other arrangements to fund and develop infrastructure.

In 2014–15, and in the context of a strategy to cope with the slowdown in output, a new wave of reforms has been initiated. The reforms are the first steps on a medium-term agenda, which is highlighted as critical by this report. The measures focus on:

- Lowering costs of entry, operation, and exit of firms, with measures to reduce burdensome regulation, simplification of tax procedures, a first step to make the labor market more flexible, and insolvency proceedings simplification.
- Initial aspects of trade facilitation, including the reduction of tariffs for some intermediate goods, and support for firms in terms of product accreditation and certification to reach new export markets.
- In addition, regulations to accelerate a prudent implementation of the PPPs framework have been initiated.

There is no question that further reforms will be needed to hold to the needed direction, but Peru can feel proud of its remarkable reform achievements.

Source: Background paper prepared for this report by Céspedes and Lengua-Lafosse (2015), Central Bank, and Ministry of Economy and Finance of Peru.

2. Growth in Peru - drivers and challenges

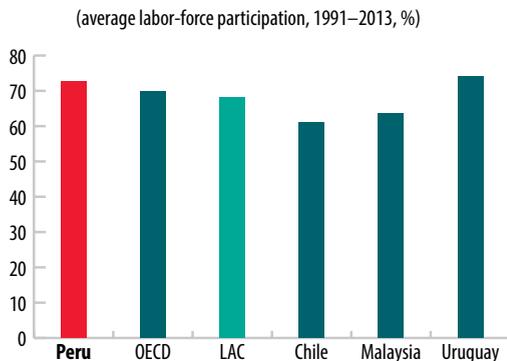
Labor and capital accumulation were some of the early drivers of growth

With relatively high labor and capital accumulation, Peru has had enough input accumulation to fuel growth. It achieved substantial labor accumulation, which was supported by a strong demographic dividend and high labor force participation (Figure 8). Capital accumulation was at the level expected for Peru's income per capita (Figure 9). But there could be significant gains by improving the quality of those inputs, as it is discussed later in this report. (see Sections 8 and 9).

Peru increased domestic savings sharply and they helped to finance capital accumulation, unlike in other LAC countries.

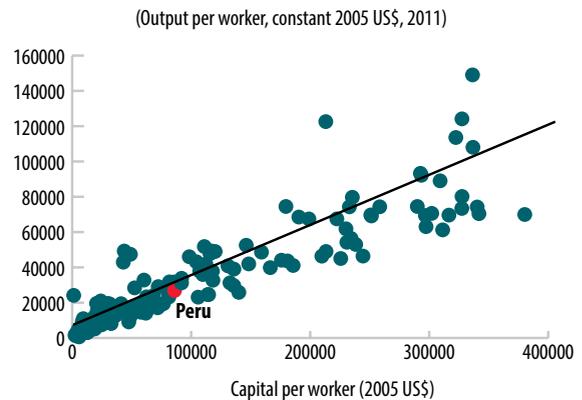
In the 2000s, growth fueled by favorable external conditions led to an almost one-to-one increase in consumption in LAC5⁸ countries; as a consequence, increases in savings were only a small fraction of GDP, 0.3 percentage points (Figure 10). In Peru, conversely, 1.8 percentage points of the 5.7 percent growth went into savings, and domestic savings became the main driver of investment growth as domestic financing reached 86 percent (Figure 11). In almost every LAC5, country investment increases were financed mostly by external savings (apart from

Figure 8. Labor force participation is higher than in comparator countries



Source: WDI.

Figure 9. Capital accumulation is as predicted for Peru's income per capita



Source: WDI.

8 LAC5 are Argentina, Brazil, Chile, Colombia, and Mexico.

2. Growth in Peru—drivers and challenges

Figure 10. Peru increased savings sharply during the rapid growth period, unlike LAC5 countries

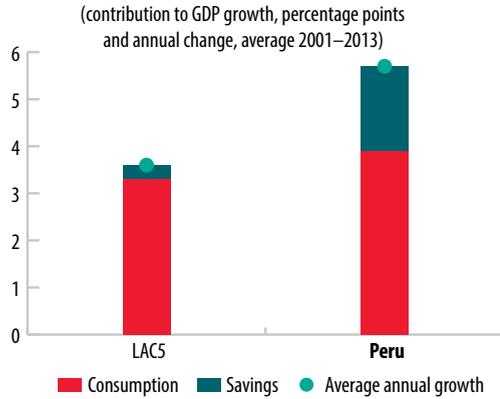


Figure 11. Domestic savings were the mainsource of investment

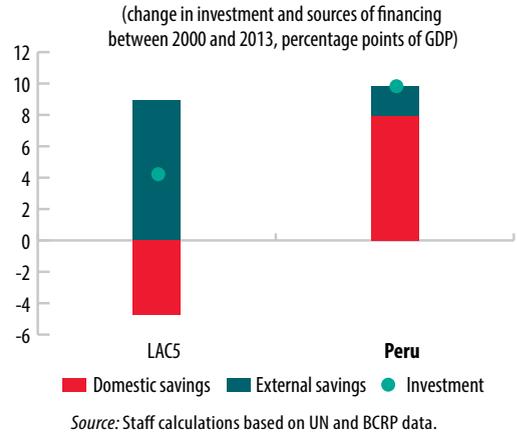


Figure 12. Both private and public sectors contributed to boost savings

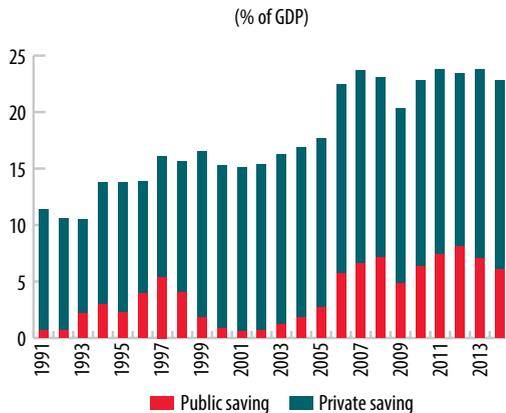
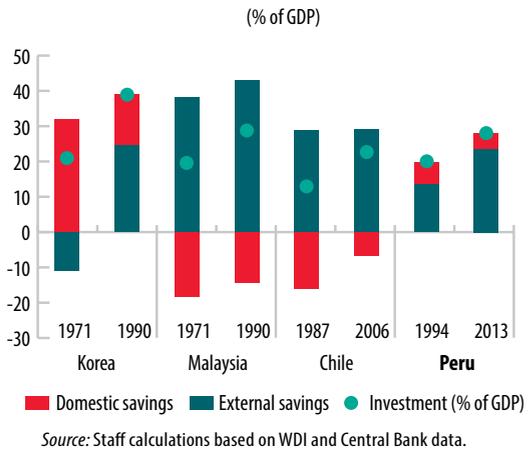


Figure 13. Peru is similar to other successful MICs during their growth spurts in accumulating domestic savings



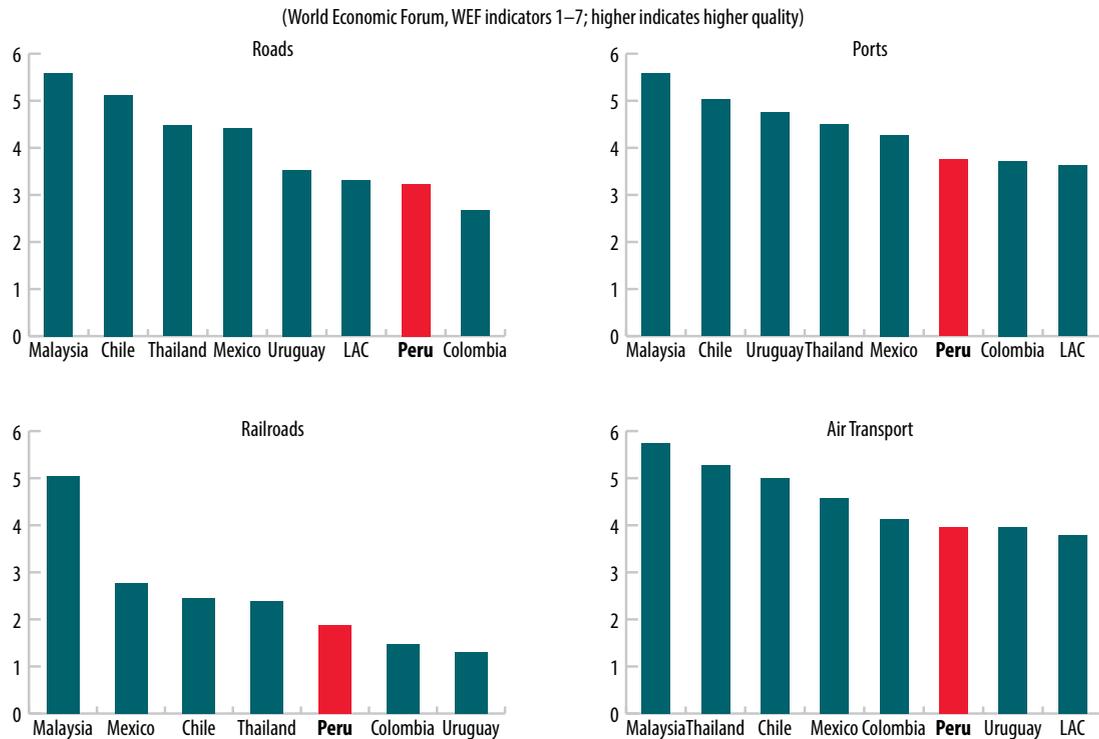
Colombia, where external savings financed 17 percent of the increase).

Peru saved domestically and used external sources to finance its growth, without running fiscal or current account deficits. Savings increased from just above 10 percent of GDP in the early 1990s to 22 percent in 2014 (Figure 12), driven mainly by the private sector, with a stronger push from the public sector in the mid-2000s. Peru resembles most of the successful, fast-growing MICs during their boom years, and differs from regional comparators in this area (Figure 13). Prudent macroeconomic and stabilization policies and the high saving rates allowed Peru to reduce debt to 20 percent of GDP, accumulate ample international reserves and fiscal buffers, run fiscal

account surpluses and only a small current account deficit for most of the last decade. In Peru, the external savings that were used to finance growth were mostly FDI, not debt. These outcomes have made Peru more resilient to positive and negative external shocks.

Despite significant improvements, infrastructure gaps across sectors remain large while export diversification is limited. Public capital spending has increased over the last years, from 3.8 percent of GDP in 2000 to 6.1 percent of GDP in 2013—a highly positive development. But infrastructure gaps across sectors are large. For example, the transport and logistics infrastructure, which is the backbone of domestic commerce and international trade, stands as less developed when compared to relevant

Figure 14. Peru's infrastructure is lower quality than in peer MICs, especially in road network and ports



Source: World Economic Forum (2015).

peers and competitors (see Figure 14). Road density coverage and percentage of paved roads is relatively low, and with limited connectivity between the most important agricultural, consumption, and export areas, and limited capacity to link production to ports and airports for export. These constraints also impede the growth of exports, which remain undiversified. Overall, five sectors (minerals, metals, vegetables, foods, and textiles and apparel) accounted for 91 percent of merchandise exports in 2014, virtually unchanged since 1994, and with minerals taking a significant share. In the context of a non-temporary adjustment in commodity prices, growth in high value-added manufacturing and services will help to support sustained growth.

Peru also gained from structural shifts, though a large informal sector remains a drag on growth

Growth since the 1990s has been broad across economic sectors, with industry and services leading in the 2000s. Peru's economic structure

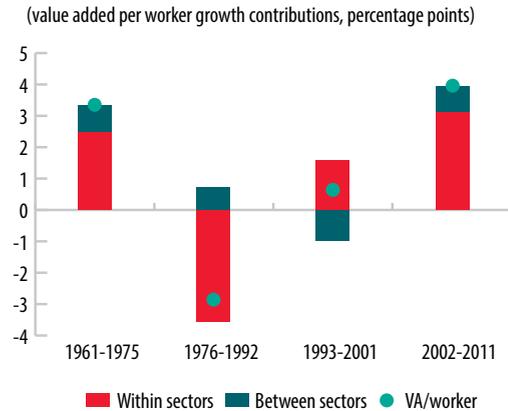
today is similar to that of two decades ago, with services accounting for 58 percent, industry 36 percent, and agriculture 6 percent of GDP. The sectorial contributions to growth therefore largely reflect differences in sector size rather than different growth rates. Of the 4.9 percent average annual growth during 1995–2013, services accounted for 2.9 percent, industry 1.8 percent, and agriculture 0.3 percent. The three sectors grew at similar average rates over the whole of the two decades, but in the 1990s growth of agriculture outpaced that of industry and services, and in the 2000s industry and services grew faster.

Positive structural change contributed to productivity growth. At the aggregate level, average labor productivity (measured as value added per worker) can increase for two reasons: higher productivity within one or more sectors of the economy; or structural shifts in employment from lower- to higher-productivity sectors.⁹ Measures of value added per worker and

⁹ In the analysis behind this paragraph, labor productivity is measured as value added (GDP) per worker, based on sectorial data from the Groningen Growth & Development Centre

2. Growth in Peru—drivers and challenges

Figure 15. Although labor productivity growth has been driven mainly by improvements within sectors, structural shifts between sectors have also helped recently



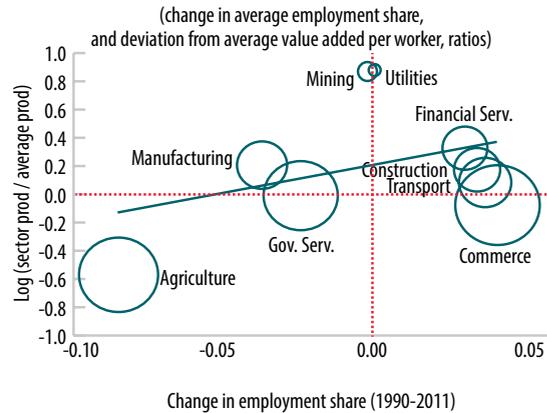
Source: Authors' calculations based on Groningen Growth & Development Centre data; Background paper prepared for this report by Barco and Vostroknutova (2015).

employment patterns across 15 economic sectors were used to estimate the relative contributions of these two sources, and show that overall productivity growth was largely the result of improvements within sectors, though structural shifts across sectors also played a role. The between-sector shift subtracted from aggregate value added per worker growth over 1993–2001 (although it was outweighed by the within-sector shift), but both contributed positively during 2002–11: out of overall labor productivity growth of almost 4 percent per year, shifts in employment from agriculture to construction and services accounted for about 1 percent, while within-sector gains accounted for the rest (Figure 15).

Labor relocation from agriculture to services was an important source of labor productivity gains from structural shifts. Between 1990 and 2011, the rural–urban transformation continued, reducing the agriculture's share of employment from 31 percent to 23 percent; that of services and construction increased from 55 percent to 67 percent. Labor productivity grew in all sectors. While labor moving from agriculture to services was an important source of labor productivity gains from structural shifts, it is also important to highlight that the services sector has not been as productive as it could have been, as the report finds at firm-level (Sections 3 and 4).

database. Following the standard critique of this approach, we also constructed marginal labor productivity measures by sector and conducted similar analysis (using the World Bank I2D2 database for wages). The ranking using marginal measures of labor productivity was the same.

Figure 16. A structural shift toward services has supported overall growth in VA/worker, but more productive manufacturing has shed labor



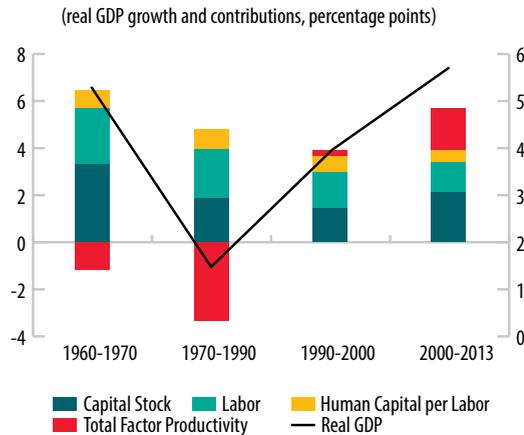
Source: Authors' calculations based on Groningen Growth & Development Centre data; Background paper prepared for this report by Barco and Vostroknutova (2015).

Notably, however, manufacturing—which has been more productive—also lost some labor to services. Manufacturing's share fell from 12 to 9 percent between 1990 and 2011, reflecting both natural structural change and recent favorable terms of trade, which tended to expand labor in non-tradable sectors. Manufacturing's job loss is linked to the post-crisis shift in the speed of manufacturing growth: it tended to lead overall GDP growth before 2008 and trail it after. After 2008 the more complex and less labor-intensive manufacturing grew fastest (at 7.7 percent) while basic labor-intensive manufacturing grew more slowly than GDP (at 2.6 percent). Section 8 sheds further light on the dynamics of wages relative to labor productivity.

Peru also has a large informal sector that drags growth, since most of its workers have far lower productivity than in the rest of the economy. Peru's informality is high even by LAC standards: it was at 70 percent outside of agriculture, above Mexico's 60 percent and Colombia's 54 percent in 2009.¹⁰ As discussed in Section 6, workers in the informal sector are on average only one-third as productive as formal workers. By official estimates, however, the share of informal sector in GDP was at only about 21 percent

¹⁰ ILO (2012). Peruvian authorities calculate the share of informal employment at 77.2 percent in 2009 (74.3 percent in 2012), referring to the total number of informal jobs in the formal sector (without social contributions by employers), informal companies, or the household sector; see INEI (2014).

Figure 17. The contribution from TFP to growth turned positive after the reforms



Source: Authors' calculations: Background paper prepared for this report by Savescu and Vostroknutova (2015).

Figure 18. Peru compares well to other fast-growing countries on productivity's contribution to growth



Source: Authors' calculations: Background paper prepared for this report by Savescu and Vostroknutova (2015).

in 2010.¹¹ This report focuses attention on the informal sector mostly in the context of the labor market, a decision driven both by the importance of informality for workers, as well as by the absence of firm-level data on informal firms (see Section 6).¹² Indeed, the analysis in this report uses mostly data of firms in the formal sector (which represents roughly 80 percent of the country's output), yet the findings have implications for the dynamics of the informal sector and the overall economy.

In the last decade, one-third of growth is explained by productivity growth, but the productivity gap with high-income countries is still large

Strong TFP growth has played a central role in Peru's growth in the 2000s. Before the 1990s, growth was driven by factor accumulation, with a negative contribution from TFP.¹³ Macroeconomic stabilization and structural reforms during the last two decades have improved efficiency in allocating resources and have led to more productivity-driven growth

(Figure 17). In the 2000s, TFP contributed around a third of Peru's growth.¹⁴ This kind of productivity-driven growth is similar to that in other fast-growing countries (Figure 18).

Despite its recent gains, Peru still has large income and productivity gaps with high-income countries.

Its output per worker¹⁵ is only 25 percent that of the United States, and is low compared to Chile and Mexico (Figure 19 and Figure 20). While potential gains from increasing the capital stock, human capital, and labor are significant, a TFP increase would have the highest payoff for income per capita.¹⁶

To avoid being bogged down in the middle-income trap and in the context of a less benign external environment, Peru would need to lift further productivity growth

After successfully growing from low-income to middle-income, many countries find themselves

11 INEI (2014).

12 See a more detailed discussion of this in Sections 3 and 6.

13 The analytical tool at the core of development accounting is the aggregate production function that relates inputs to outputs: the amount of physical and human capital the amount produced. If increasing the amount of inputs leads to an equivalent increase in outputs (constant returns to scale), the aggregate production function can be written in per-worker terms. Thus, we use the augmented Cobb-Douglas aggregate production function, in which output per worker is a product of human capital per worker (adjusted for quality), physical capital per worker, and a term called total factor productivity (TFP) or "efficiency."

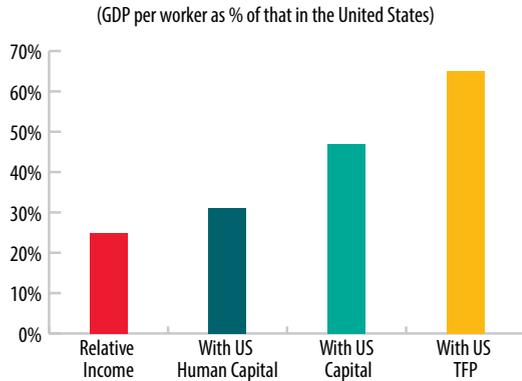
14 Growth accounting estimates the contribution to growth of labor and of capital (investment). When the sum of their contributions is not equal to the actual growth, the residual is attributed to total factor productivity (TFP)—an interactive effect that is not directly observable and is a measure of an economy's dynamic technological change. TFP is often seen as the real driver of growth. It may account for up to 60 percent of growth within economies. See Easterly and Levine (2001), among others.

15 This part of the analysis uses Caselli (2014) results and applies them to a different measure of output per worker. For output per worker estimates, this report uses PWT8.2 GDP in constant 2005 US\$, projected to 2011–2013 by growth rates of similar variable in WDI.

16 Caselli (2005).

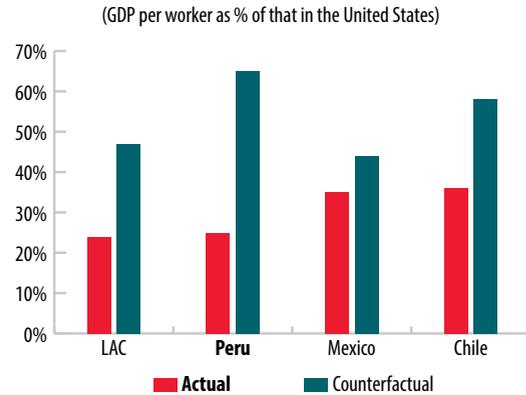
2. Growth in Peru—drivers and challenges

Figure 19. Peru could triple its income per capita if its TFP were as high as that in the United States



Source: Caselli (2015) and authors' calculations.

Figure 20. Peru would benefit from increasing TFP more than the average LAC country



Source: Caselli (2015) and authors' calculations.

Note: The counterfactual refers to output per worker that countries would have had if their TFP were equal to that of the United States.

in a “middle-income trap.” The concept of MIC trap refers to the fact that transitions from low to middle income have been more frequent than those from middle to high income: of 101 MICs in 1960, only 13 had become high income by 2008 (see Box 2). After reaching Peru’s current level of income per capita, some Asian countries were able to transition to high income in less than 10 years. It took Chile around 15 years, yet other countries in LAC have not been able to transition in over 30 years. The limited transitions to high income status in the region and globally is related to the fact that the ingredients for growth—policy and otherwise—change as countries become wealthier. Thus, the policies that propelled Peru into upper-middle-income status would not be, on their own, sufficient to continue or accelerate the convergence pace achieved over the last decade.

Moving from middle- to high-income status is achievable for Peru, but in the context of a less favorable external environment, growth will have to rely much more on productivity. To double its GDP per capita in the next 12 years, Peru would need to grow at 6 percent annually. At that rate, it could catch up with the lower bound of OECD countries’ current income per capita in 12 years. Increasing productivity is more important for Peru than for an average country in LAC (Figure 20). On average, if LAC had productivity levels equal to those of the United States, it could almost double its output per worker, from 24 percent of that in the United States to 47 percent. If Peru, however, could use its inputs as

efficiently as the United States can, it could increase its output per worker by a factor of 2.6, from 25 to 65 percent of that in the United States.

Given the importance of firms to productivity growth, the rest of the report focuses exclusively on the challenges and policy opportunities to boost firms’ productivity in Peru. In Part I, the report dealt with some of the macro aspects of growth and productivity, and highlighted some challenges (e.g., infrastructure and diversification). While acknowledging that convergence toward high income status requires a number of important ingredients, the rest of the report focuses on the underpinnings of firms’ productivity growth in Peru and the policy opportunities available to foster firm productivity in selected areas. Maintaining a clear focus and depth of analysis on this area is a core value added of this report.

The middle-income trap: a policy issue

In the last few decades, a significant number of countries transitioned from low- to middle-income status: the percentage of low-income countries in the World Bank classification fell from 30 to 16 percent between 1987 and 2013. This suggests that even over a relatively short time frame progress can be made in raising per capita incomes.

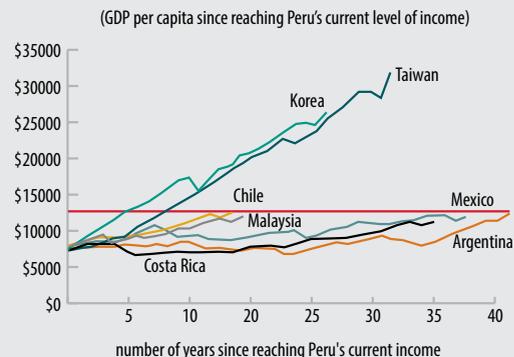
Yet countries in the middle-income group seem to languish in this category for many years or experience decelerations or stagnations in growth (see Box Figure). The notion of a “middle-income trap” was first formulated to describe the situation faced by countries having difficulty navigating this transitional stage. Many middle-income countries (MICs) seem to be caught between two models of growth, at a stage of development in which the gains to be made from labor-intensive, low value-added activities have been realized but the systems of innovation, specialization, and technological advancement necessary for high value-added, high-productivity production are not yet in place. Unable to *shift strategies*, some MICs fail to make a timely transition from resource-driven growth, with low-cost labor and capital, to productivity-driven growth.

Several policy outcomes seem to be correlated with successful transitions to high-income status: higher levels of secondary and tertiary education help prevent growth slowdowns; countries that avoided the middle-income trap had more diversified, sophisticated, and non-standard exports baskets, lower agricultural share of GDP or a higher industrial share, a higher trade share of GDP, and lower inequality. Other factors are also found to be important to the growth of MICs: the size of government, regulation, and infrastructure (roads and telephone lines); *advanced infrastructure* can help countries avoid the middle-income trap by promoting a shift in production from labor-intensive to skill-intensive activities and by increasing their pace of innovation.

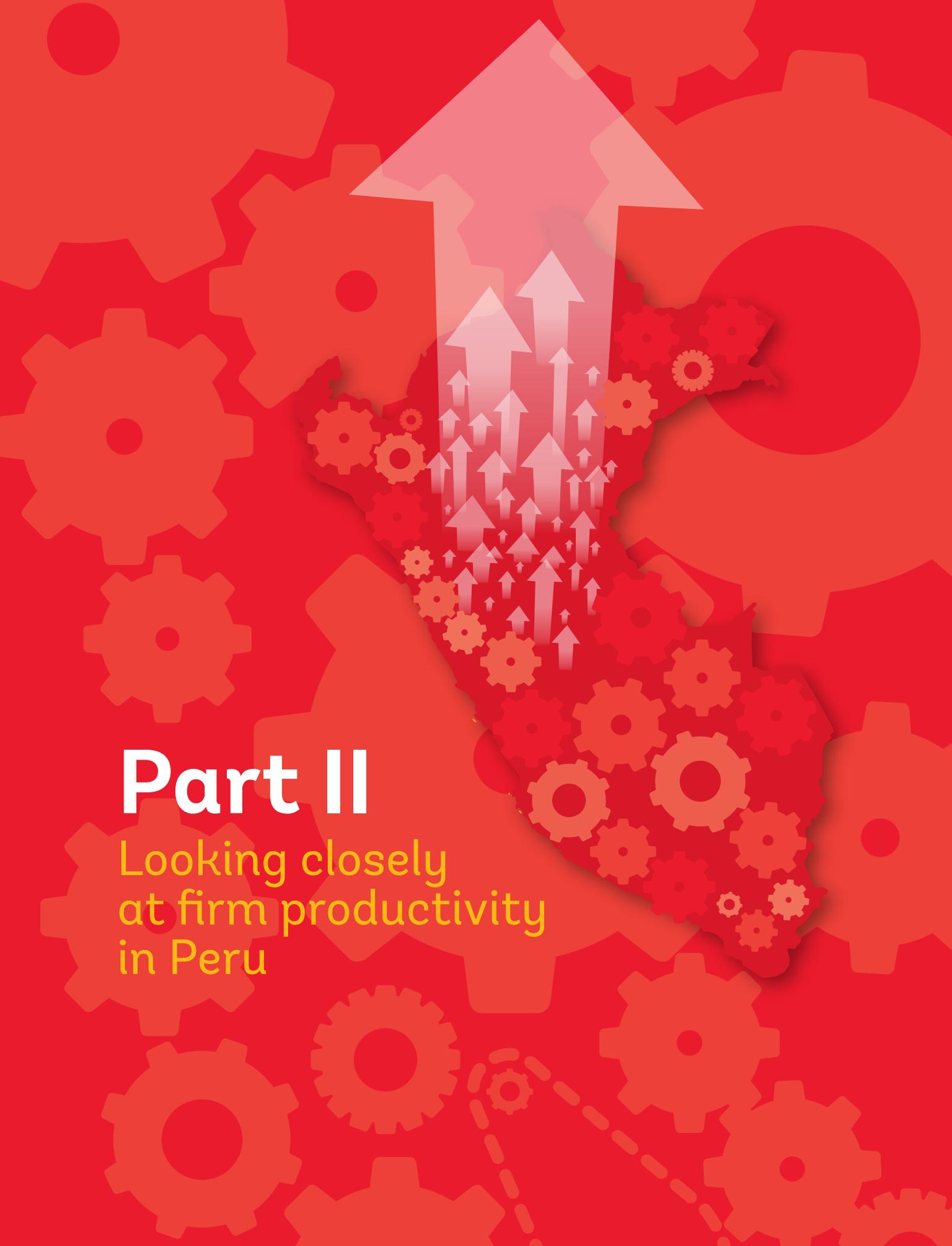
In essence, avoiding or escaping from the middle-income trap requires the evolution of policymaking to recognize new economic realities and three transitions related to this evolution: diversification to specialization; investment- to productivity-led growth; and centralized to decentralized economic management. The first requires policymakers to promote competition and creative destruction. The second involves investment in advanced education and systems to promote innovation. The third demands policymaking close to where economic activities are occurring.

The East Asian countries that were able to avoid the middle-income trap managed these transitions. They were characterized by advanced infrastructure networks and a sound intellectual property rights regime that permitted evolution from technological imitation to technological innovation. They invested in skills upgrading and supported Research and Development (R&D). And they encouraged flexible labor markets and economic openness. In general, these countries adopted policies that spurred productivity.

Box Figure. Most LAC countries are taking between 15-40 years to become an HIC after reaching Peru's income per capital level



Source: Background paper prepared for this report by Moroz and Vostroknutova (2015), drawing on Gill and Kharas (2007), Kharas and Kohli (2011), Eichengreen et al. (2013), Felipe et al. (2012), Bulman et al. (2014), Aiyar et al. (2013), and Agénor et al. (2012).

The image features a central map of Peru, which is filled with a dense pattern of gears and upward-pointing arrows of various sizes. The map is set against a background of a repeating gear pattern in shades of red and orange. A large, semi-transparent white arrow points upwards from the top of the map, symbolizing growth or progress. The overall aesthetic is industrial and dynamic.

Part II

Looking closely
at firm productivity
in Peru

3. Firm dynamics and productivity

To understand the challenges Peru faces to increase productivity, we need to look at the microeconomic drivers of growth at the firm level. Aggregate productivity growth ultimately depends on firm productivity, which is driven by factors within and outside the firm. Within-firm productivity depends on the speed of technology absorption and improvements in processes and products (innovation), which may come from the firm's own efforts, spillovers from other firms, or its international trading partners. Outside the firm, what matters is the efficiency of product and factor markets that drive the allocation of resources, so that more productive firms have easier access to the necessary factors of production, can expand more easily, and place more competitive pressures on larger incumbent firms.

Peru shows relatively high and growing productivity, but with many lagging industries

Although distant from the global frontier, Peru's firm-level productivity growth is comparable to that of other MICs and has been accelerating. A median formal¹⁷ firm in Peru is 5 percent as productive as firms

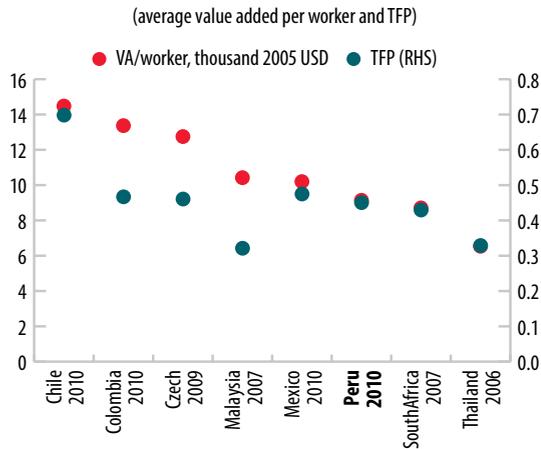
at the global productivity frontier (proxied by the top 25 percent most productive firms in the United States) in the same industry. This is, however, not too different from Colombia (6 percent) or Mexico (8 percent; Figure 21). Peruvian firms have also shown a relatively fast convergence with the global productivity frontier: between 2007 and 2011, Peru's median firm reduced its distance to the global productivity frontier by 11 percent (Figure 22).

Not all industries and subsectors contribute positively to the overall TFP growth. There is wide variance within both manufacturing and services, where high TFP growth in some subsectors is offset by negative growth in many other subsectors. The number of industries with negative TFP growth rates is higher in services than in manufacturing (Figure 23). Wholesale and gambling services have been the most productivity-reducing, while telecommunications, software, and civil engineering have added the most to overall sector productivity (see Box 3). In manufacturing, some sectors (such as food manufacturing) have significant roles in raising aggregate TFP both due to

these peculiarities into the analysis. Further, as shown in the recent report analyzing entrepreneurship in Latin America (World Bank, 2014), it is important to take into account general equilibrium effects as the size and growth of formal firms is likely to influence the behavior and size of informal ones as discussed in this Section. However, throughout the analysis in this report, it is important to keep in mind the caveat that—although every effort has been made to account for the informal sector in drawing conclusions—they often refer exclusively to the formal-sector companies.

¹⁷ It is important to note that this report's firm-level analysis is based on data covering formal firms only. While formal sector accounts for 80 percent of GDP, its employment share is only about 20 percent, according to INEI (2014). Accordingly, the inferences we make about the overall economy are especially relevant for production and value added given the coverage of formal firms. In Section 6, we make a special effort to incorporate

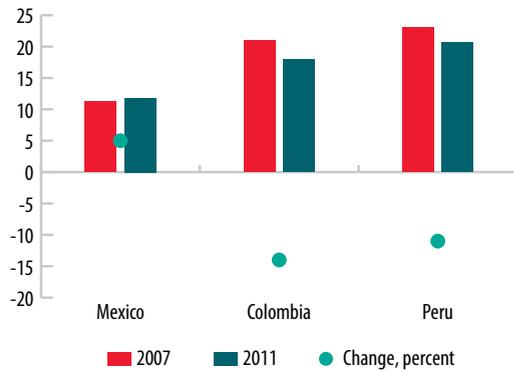
Figure 21. Peruvian firms' productivity is at par with comparators



Source: Authors' calculations based on Enterprise Surveys.

Figure 22. Firm productivity has been converging with the United States

(distance in value added in manufacturing per worker between median firm in Peru and United States, top 25% most productive firms, times; and change in distance, %)



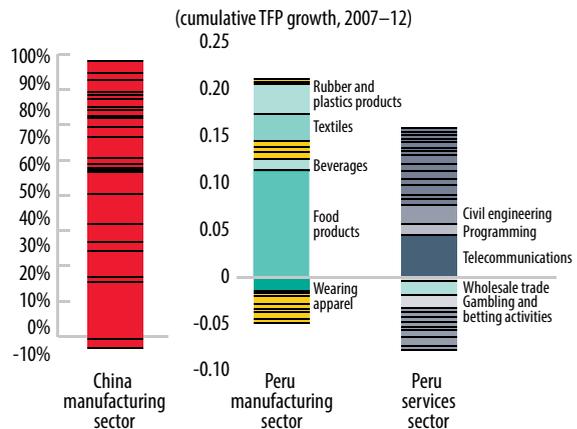
Source: Authors' calculations; background paper prepared for this report by Iacovone and Tran (2015), based on Annual Economic Survey (Encuesta Económica Anual, EEA) by INEI.

high growth and large shares of output, while others (such as apparel, chemicals, or metallic products) have reduced it. These patterns stand in contrast with those in, for example, China, where almost all manufacturing subsectors have contributed to TFP growth positively.

There is high dispersion in productivity between firms and also differences by geographic region

The differences in productivity between firms are larger in Peru than in other countries, suggesting that there might be significant anomalies in factor allocation. In adopting a micro-lens to assess productivity, the first crucial finding is the degree of firm-level heterogeneity. While micro-level productivity heterogeneity is a common stylized fact around the world,¹⁸ Peru is characterized by a high level of productivity dispersion vis-a-vis other countries in LAC and especially the United States. In Peru, firms in the 90th percentile of the productivity distribution are 500 percent more productive than those in the 10th percentile; this contrasts with around 200 percent in the U.S. (Figure 24). Such disparities mean that some firms are able to produce much more given the same inputs, within the same industry. This disparity could be attributable to variations in technologies, processes, human capital, and managerial skills. But, more important, this is a sign of strong disparities in the allocation of factors of production, and a reason

Figure 23. Productivity dynamics differ by sector and industry



Source: Background paper prepared for this report by Iacovone and Tran (2015); and Brandt et al. (2012) for China.

Note: The graph depicts contribution to TFP growth from industries (sub-sectors) within manufacturing and services sectors. The industries below zero have negative TFP growth rates, and therefore slow overall TFP growth. China's results are a percentage of total TFP growth.

to look further into this issue, because the presence of large productivity dispersion is a condition that increases the importance of resources allocation.

There are also notable differences in productivity and employment growth among firms in different regions of Peru. Firms in Lima have been on average more productive than those in the Sierra and Selva regions, while firms in the Costa have moderately

18 Syverson (2011).

Telecommunications: a booming industry in services sector

The value added in the telecommunications sector has been growing faster than GDP since 2003, and accelerated even more since 2006—to 14.1 percent a year. Similarly, the sector’s contribution to GDP growth increased dramatically between 2006 and 2013.

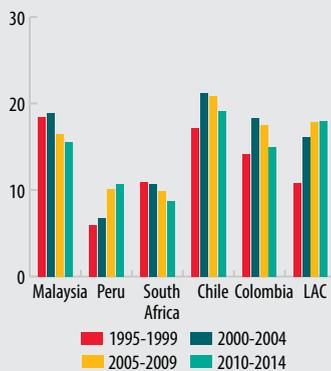
As a result of this growth, the provision of telecommunication services expanded rapidly in Peru. Fixed lines increased from 4 per 100 people in 1995 to 9.9 in 2014. Similarly, mobile lines increased from 0.3 per 100 people in 1995 to 103 in 2014. Internet use also grew, from almost none in 1994 to 40.2 people per 100 in 2015. While impressive, this success has yet to bring Peru to the level of telecommunication services experienced by its peer regional MICs.

The rise of telecommunications has enabled the launch of call centers, which have had a remarkable evolution in Peru, thanks to still competitive costs of labor and real estate. In this context, the size of the call center industry more than doubled between 2005 and 2011. This was largely sustained by exports of call center services, which increased from 1 percent of the total turnover of the industry in 2005, to more than 40 percent in 2011. This increased

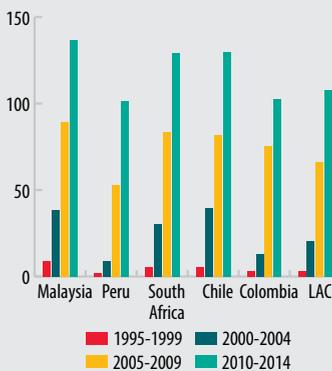
the demand for labor in the sector, which now employs more than 40,000 workers.

These positive developments have occurred even though the expansion of physical infrastructure has not kept pace with the growth in demand. Currently, the quality of telecommunications services can be slow, partly due to a deficit of about 14 thousand antennas in Peru, according to official estimates. This has been associated with regulatory burdens imposed by some local governments that have blocked the installation of infrastructure (see Section 5 of this report). As a result, the average mobile data consumption in Peru is less than a quarter of that recorded in Chile, less than half of that in Colombia and Venezuela and is also lower than those in Argentina and Ecuador. A new regulation was enacted in April 2015 that seeks to unify the processes in municipalities and creates a mechanism for the automatic approval of applications for installation of infrastructure. The implementation of the Fiber Optic National Network to be completed by mid-2016 that connects 90 percent of the provincial capitals of the country would also provide much-needed infrastructure that is expected to increase penetration of information technology.

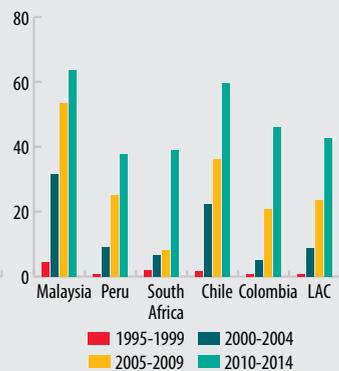
Box Figure 1. Fixed telephone subscriptions per 100 people



Box Figure 1. Mobile telephone subscriptions per 100 people

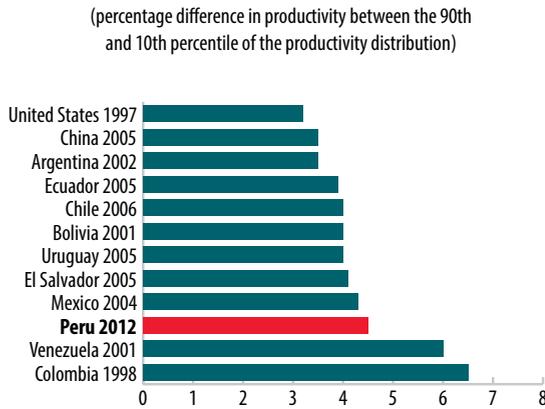


Box Figure 1. Internet users per 100 people



Sources: official data, INEI, WDI.

Figure 24. There are large differences in productivity levels across firms in Peru



Source: Peru data are from a background paper prepared for this report by Iacovone and Tran (2015); data for other countries are from Inter-American Development Bank (2010).

started to converge toward Lima more recently.¹⁹ There have also been notable differences between firms in Lima and the Costa region versus those in the Sierra and Selva regions in employment growth: firms outside the coast did not grow at all (Box 4).

Firms grow slowly, indicating rigidities in factor allocation

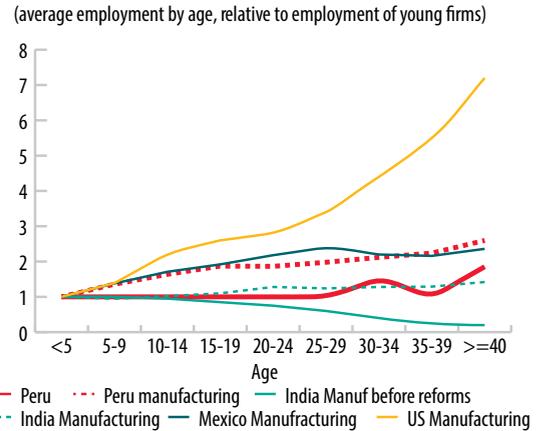
Firm grow slowly in Peru, and that may also be encouraging informality. In countries where input and output markets work well, firms that survive experience rapid growth, a process that is best described as creative destruction.²⁰ This sort of pattern is observed in the United States, for example, where old firms (i.e., those 40 years old or more) are about eight times larger than young startups. In Peru, however, there is evidence of stunted growth: old companies are, on average, only about twice the size of younger ones (Figure 25).²¹ This finding indicates that, beyond high costs of entry, the costs of operation are large and hamper firms' growth. Stunted growth in

¹⁹ These geographical regions translate as Costa (coastal), Sierra (mountainous), and Selva (jungle) and cover 24 regions ("departments") and one constitutional province. See Box 4.

²⁰ The term "creative destruction" was coined by Schumpeter (1942). The growing modern literature on the life cycle of firms and the relationship with productivity is reviewed in, for example, Alciguit et al. (2015).

²¹ Hsieh and Klenow (2014) construct a synthetic panel with 2 years of manufacturing data. They assume that the same cohort experiences similar rates of exit and growth. They compute growth of the synthetic cohort weighted by sector. We regress age categories on size (log) and control for sector, location, and year.

Figure 25. Firms in Peru grow slowly, especially in sectors other than manufacturing



Source: Hsieh and Klenow (2014); and background paper prepared for this report by Aterido et al. (2015), based on Annual Economic Survey (EEA) by INEI.

Note: India data are for 1989–94 (before reforms) and 1994–2011 (after reforms).

formal firms may also be encouraging the growth in the informal sector, as job opportunities are not created at the pace that is needed in the formal sector. That is, in the absence of better employment prospects, many people may end up working for themselves, fueling a vicious cycle of small-size and few good jobs for future job seekers.²² Experience in other countries shows that reforms can have a strong impact on mitigating stunted growth: India, for example, shows a striking difference in firm growth before and after reforms directed at improvements in licensing, privatizations, and increasing efficiency of the trade system that also led to increased competition and productivity growth (Figure 25).²³ These reforms are directed at improving factor allocation between firms, as discussed in the next sections.

Peru, unlike other countries, seems to show a negative relationship between firm size and productivity.

In an environment where firms have access to appropriate inputs and output markets are efficient, productive firms can expand while less productive firms are likely to stay small, or ultimately exit. The expectation would be to find older and larger firms that are more productive (as they have survived and grown) and young firms that are, on average, less so.²⁴ There are only a few young Peruvian firms:

²² See World Bank (2014) for a framework in the regional context.

²³ See, for example, Krishna and Mitra (1998).

²⁴ This pattern is consistent with a large class of Input-Output models of industrial dynamics as in Jovanovic (1982).

Geographic dimensions of productivity in Peru

Peru is geographically diverse with three main areas: Costa (coastal), Sierra (mountainous), and Selva (jungle), which cover 24 regions (“departments”) and one constitutional province. Economic activity is concentrated in the coastal area, which contributes almost 80 percent of national output. Also there, the regions of Lima and Callao make up the Lima Metropolitana geographic area, which accounts for 34 percent of the country’s population and 48 percent of national output.

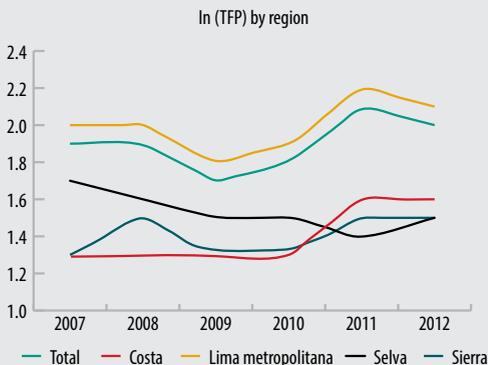
The coastal region benefits from proximity to the Pacific, greater population density, and better-developed infrastructure. Secondary (manufacturing) and tertiary (services) activities predominate there. Tertiary activities, closely linked to domestic demand, are also relatively sophisticated in the coastal area, but underdeveloped in the Sierra and Selva areas. Primary activities are more widespread geographically. Although the valleys of the north coast lead in agribusiness, the Sierra is the main producer of crops for domestic consumption as well as the main metals mining region. Oil extraction is concentrated in the Selva.

Lima Metropolitana is the largest city, and the focus of manufacturing, construction,

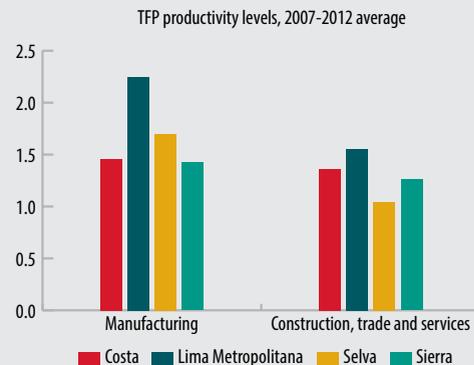
commerce, and services. Almost half (47 percent) of all firms are in Lima, including 60 percent of manufacturing, 38 percent of construction, and 65 percent of services firms. Following Lima, the main regions are Arequipa (5.2 percent of GDP), La Libertad (4.2 percent), and Piura (3.6 percent). These have diverse economic profiles: Piura and La Libertad have a large contribution from primary activities, and Arequipa has a strong industrial sector. Peru’s main ports are also in these regions: Callao (Lima), Matarani (Arequipa), Salaverry (La Libertad), and Paita (Piura); activity of the river ports in the Selva is small.

Lima Metropolitana is the most productive region (Box Figure 1). Other areas—Costa (excluding Lima Metropolitana), Sierra, and Selva—were about 30 percent less productive than Lima Metropolitana in 2012. But Costa and Sierra have been catching up. Productivity is more homogeneous across regions in the non-tradable sectors than in manufacturing (Box Figure 2). There are also notable differences between firms in Lima and the Costa region versus those in the Sierra and Selva regions in employment growth: firms away from the coast did not grow at all (Box Figure 3).

Box Figure 1. Productivity is higher in Lima, but generally picking up in other regions



Box Figure 2. Productivity across regions is more homogeneous in non-tradable sectors

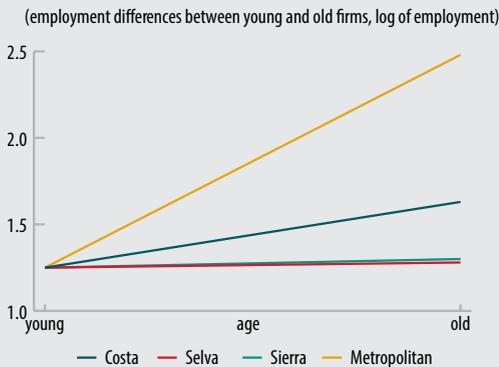


Geographic dimensions of productivity in Peru (cont.)

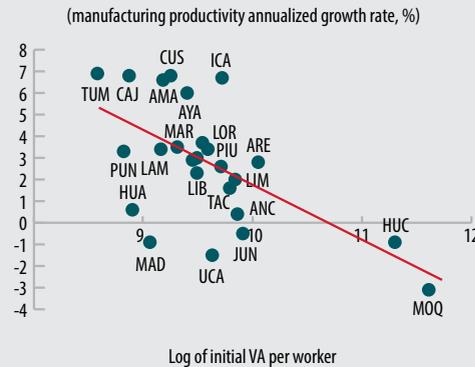
Overall—and based on National Accounts data that include the informal sector—there has been some gradual convergence on output per worker between regions, but the large gaps remain vis-à-vis Lima. Departments with lower labor productivity in 2001, on average, experienced faster growth. The convergence in labor productivity in manufacturing and mining has been sizable enough to lead to convergence in aggregate departmental labor

productivity. This helps explain the relative performance of geographic areas in overall productivity dynamics (Costa is a leading manufacturing producer while Sierra has most of the mining—Box Figures 1 and 4). With large regional differences in labor productivity, a process of sustained productivity catchup by lagging regions has much potential to raise aggregate productivity and incomes, and to reduce regional inequalities.

Box Figure 3. Only firms in the coastal area grow



Box Figure 4. Regions are converging on manufacturing value added per worker



Sources: Background papers prepared for this report by Iacovone et al. (2015) and Iacovone and Tran (2015), based on data provided by EEA/INEI and national accounts.

10 percent of firms are between 1 and 5 years of age, while two-thirds are between 6 and 19 years old. These young firms, however, are the most productive—a somewhat counter-intuitive finding given international experience. If productive firms grow, there should be a positive relationship between size and productivity. But Peru seems to have a negative correlation between size and productivity (Figure 26). TFP by firm size does not differ significantly on the different dimensions (geographic area or economic sector) and similar relationships hold when productivity is measured as value added per worker.

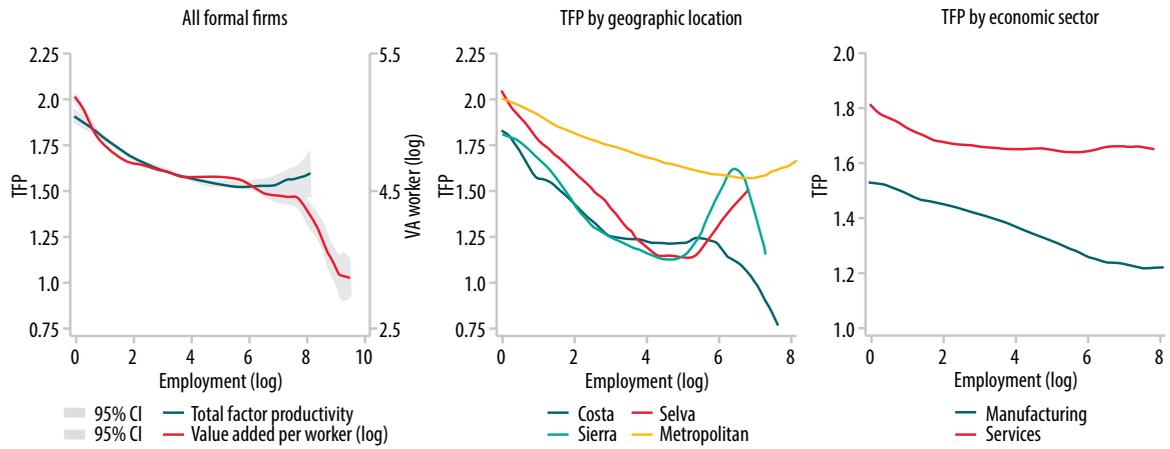
firms. This problem is sometimes called “factor misallocation.” Productivity may grow by increasing workers’ output within a firm (*within-firm*), or by employees (and capital) moving from less efficient to more efficient firms (*between firms*). Section 4 decomposes productivity growth into that driven by *within-firm* productivity growth and that driven by the efficiency in allocation of factors of production *between* firms. It suggests policy avenues that could reduce *misallocation*, and estimates the potential impacts of reducing misallocation on productivity and economic growth.

The findings above point to structural and market anomalies that tend to channel labor and other factors of production into less-productive

3. Firm dynamics and productivity

Figure 26. There is a negative relationship between firm size and productivity in Peru

(relationship between productivity (TFP or VA/worker) and employment)



Source: Authors' calculations: Background paper prepared for this report by Aterido and Iacovone (2015), based on EEA data by INEI.

Note: Weighted local Epanechnikov kernel polynomial smoothing is used. The sample of large firms is small and results at that end of the distribution should be interpreted with care. Standard errors of large firms in Costa, Selva, and Sierra are larger than 0.5.

4. Issues with factor allocation

Misallocation of factors is usually to blame for the stunted growth and other inefficient firm dynamics described in Section 3. Main causes of misallocation are inefficiencies in product and factor markets, which are induced by poor competition, inefficient regulations, or other market imperfections—such as those in labor and credit markets. A specific type of misallocation responsible for stunted growth is that which discourages firms from investing, growing, and raising productivity.²⁵ A possible set of causes driving this misallocation include contractual frictions in hiring nonfamily workers,²⁶ financial market imperfections limiting access to capital to better-connected (and not necessarily more productive) entrepreneurs,²⁷ difficulty in recruiting skilled managers,²⁸ higher tax enforcement on larger firms,²⁹ and difficulty in access to land and its misallocation.³⁰ Other research suggests that managerial quality is an important factor in empowering transformative entrepreneurs who strive to grow, and thus has a strong impact on allocation.³¹ In India, for example, an intervention to improve management quality led to a 12 percent TFP growth after a year.³²

Inefficient allocation of factors dragged down aggregate productivity growth, which was driven by within-firm productivity improvements

Peru’s overall productivity growth is driven by within-firm productivity but dragged down by inefficient allocation of labor between firms (or “misallocation”). As discussed earlier, productivity may grow by increasing workers’ output within a firm or by employees (and capital) moving from less efficient to more efficient firms. Figure 27 shows the results of the productivity decomposition for Peru, which breaks the drivers of productivity growth into those originating from within-firms and those coming from various allocation issues.³³ While overall

33 Productivity growth and its sources cannot be observed directly but must be inferred using statistical techniques. The purpose of this analysis is to estimate productivity of firms and sectors and the factors that lead to rising productivity. The Annual Economic Survey (EEA) has data for 2007–12 on firms’ inputs, outputs, and productivity. These can be grouped to estimate productivity by sector. Using statistical techniques from Restuccia and Rogerson (2008) and Olley and Pakes (1996), it is possible to split productivity into an unweighted average of firm-level productivity in a sector and a term that measures whether labor is flowing to the most efficient firms (covariance between firm’s productivity and its market (or input) share). The covariance term measures whether resources are efficiently allocated between firms: a positive value indicates that more productive firms have higher market share, while a negative value indicates that less productive firms do. An increase in the covariance term would therefore mean improvements in labor allocation, that is, that labor flows increasingly to more productive firms. Depending on the magnitude of the relationships, the statistics can also impute increases in aggregate productivity that would result from moving workers from less productive to more productive firms or sectors.

25 Hsieh and Klenow (2014).

26 Recent research provides some evidence on this; see, for example, Caria and Falco (2014) for the case of Ghana.

27 Virgiliu and Xu (2014); Buera and Shin (2010).

28 Bloom et al. (2013).

29 Caprettini (2014), Leal-Ordóñez (2013).

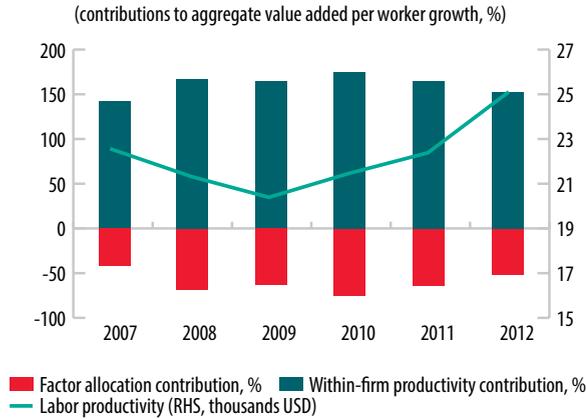
30 Duranton et al. (2015).

31 Akcigit et al. (2015).

32 Bloom et al. (2013).

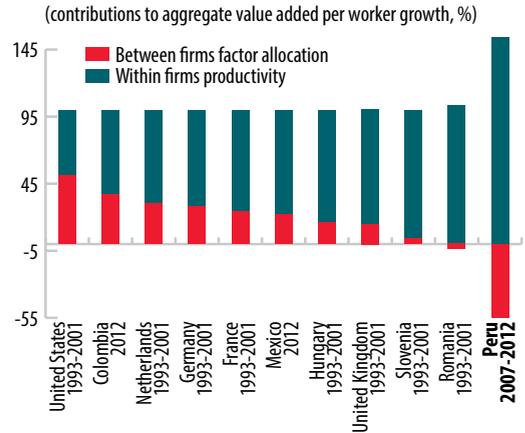
4. Issues with factor allocation

Figure 27. Within-firm productivity growth drives overall productivity growth, but is dragged down by factor misallocation



Source: Authors' calculations: Background paper prepared for this report by Iacovone and Tran (2015), based on EEA by INEI.

Figure 28. Peru's negative impact of factor allocation signals serious market distortions



Source: Authors' calculations: Background paper prepared for this report by Iacovone and Tran (2015), based on EEA by INEI; Brown et al. (2015); and Bartelsman et al. (2009).

productivity grew, it was driven by increases in within-firm productivity, while it has been dragged down by inefficient allocation of factors of production. This misallocation effect is far stronger in Peru than in Mexico, Colombia, and other countries (Figure 28).

Misallocation in the services sector harms aggregate productivity directly and through intermediate product markets

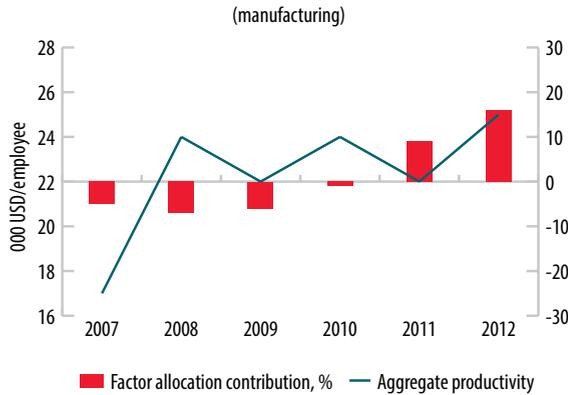
Inefficient allocation of factors among firms has limited aggregate productivity growth, especially in the services sector. Firm-level productivity grew in both manufacturing and services sectors in 2007–12, but growth was slower in services. In manufacturing, the allocation of factors between firms went from contributing negatively to positively (Figure 29), a critical trend in this sector. But in services, the slower growth in productivity is fully accounted for by the high negative contribution from allocation of labor between firms (Figure 30), as labor moved from more to less productive firms.

There are several possible explanations for the differences in factor allocation. Because rigidities in product and factor markets usually cause misallocation, these in turn could be due to sector-specific regulations. Common regulations could also become more binding in the services sector due to its higher labor intensity (such as hiring and firing constraints); and as a non-tradable sector,

services might have a less competitive environment or find domestic regulations more binding than firms in manufacturing, which are subject to foreign competition.

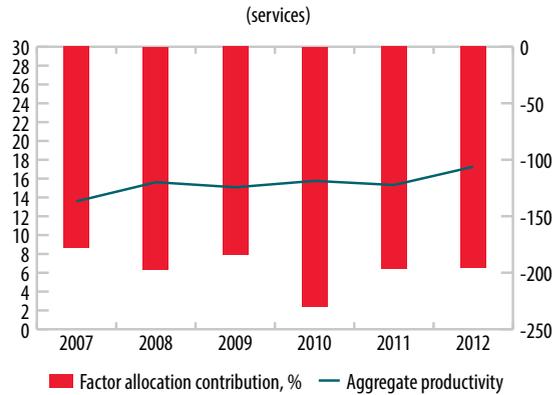
Misallocation in the services sector is also reducing productivity growth indirectly by constraining other sectors' growth that rely on it for inputs. Services—especially “other business services”—are an important input into other sectors, including manufacturing. If services are overpriced or of low quality due to poor allocation of resources, other sectors, such as manufacturing, would tend to rely less on these external inputs and sub-optimally produce them internally (e.g., transport services). This hampers the productivity growth that comes from specialization, because firms would produce goods and services outside their core competencies and inside their production possibility frontiers. The Peruvian services sector contributes only 4.8 percent of domestic manufacturing value added and only 8.4 percent in exported manufacturing value added, which is much lower than in other countries (Figure 31). In exports—where services contribute only 19 percent of exported value added—it performs poorly versus comparators: Thailand (30 percent), Chile (32 percent), Colombia (26 percent), South Africa (42 percent), and even China (26 percent). Peru's impact of allocative inefficiencies in services is especially large relative to other countries in LAC. Reducing these distortions would increase TFP in Peru by an estimated 20 percent, far more than in Mexico and Colombia (below 5 percent) and Chile (10 percent) (Figure 32).

Figure 29. Allocation of factors in manufacturing has improved, boosting productivity growth



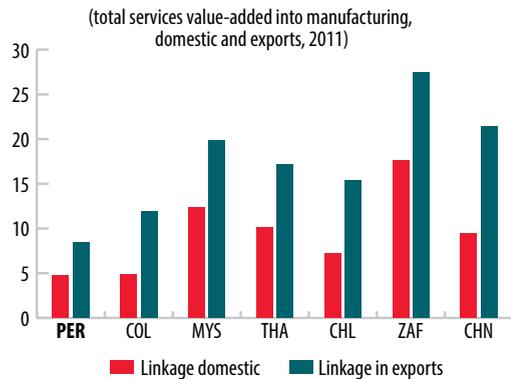
Source: Authors' calculations; Background paper prepared for this report by Iacovone and Tran (2015), based on Annual Economic Survey (Encuesta Económica Anual, EEA) by INEI.

Figure 30. Services have seen no improvement in allocation, dragging down aggregate productivity growth



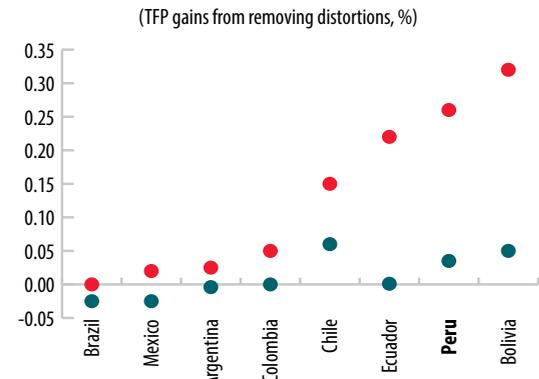
Source: Authors' calculations; Background paper prepared for this report by Iacovone and Tran (2015), based on Annual Economic Survey (Encuesta Económica Anual, EEA) by INEI.

Figure 31. Services in Peru do not provide sufficient intermediate inputs to support the manufacturing sector



Source: Authors' calculations; Background paper prepared for this report by Saez et al. (2015), based on Exports Value Added (EVA) Database.

Figure 32. Peru is among the countries that would benefit most from eliminating distortions in services



Source: Authors' calculations; Background paper prepared for this report by Fattal (2015), based on Censo Nacional Económico (CENEC) 2008 by INEI.

Removing distortions in product and factor markets would boost Peru's productivity

Significant gains in productivity can be achieved by improving the allocation of factors between firms. When resources are misallocated, the economy operates inside its production possibility frontier. TFP will be lower, and the economy will produce less output with its resources than it is capable of. Removing rigidities would yield additional productivity gains. In Peru, the benefits from eliminating distortions are large, estimated at 25–130 percent of current productivity. Productivity improvements of this magnitude could place Peru well above the LAC average and at par with

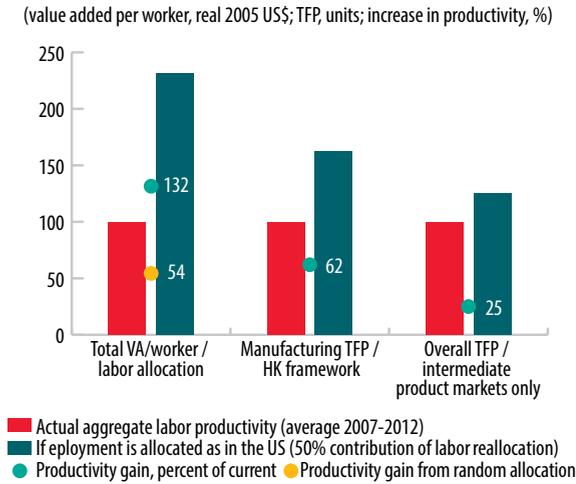
Chile on output per worker (Figure 34). To understand some broad dimensions of the impact of productivity improvements, consider the following:

- If *labor were reallocated as efficiently as in the United States*, productivity (value added per worker) could increase by 130 percent (Figure 33).³⁴ Output per worker would more than double, making Peru close to the hypothetical level if it had U.S. levels of TFP and well above that of Chile (compare Figure 20 and Figure 34).
- Further, if the distortions in *intermediate product markets* were eliminated, TFP could increase by

³⁴ This case is likely to include market distortions as well as capture other inefficiencies. See Iacovone and Tran (2015).

4. Issues with factor allocation

Figure 33. Peru could significantly increase productivity by removing allocative distortions...



Source: Background papers prepared for this report by Fattal (2015) and Iacovone and Tran (2015).

Note: TFP estimates are based on the CENEC 2008 by INEI. Value-added estimates are based on EEA average over 2007–12 and assume that labor allocation contributes half to aggregate productivity, as in the United States.

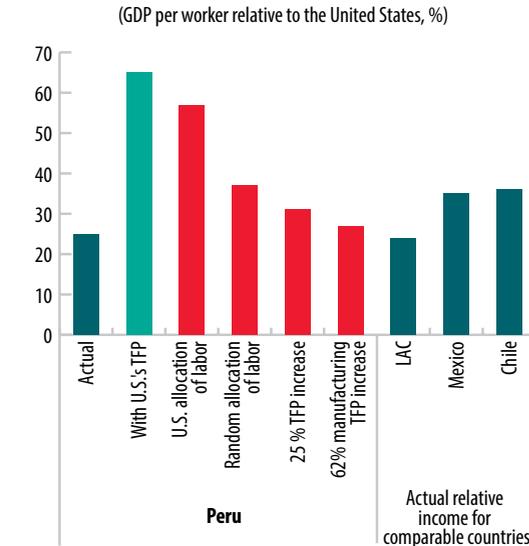
25 percent. This would correspond to an inter-industry production function the same as that of the United States.³⁵ The existing distortions lead to prices for intermediate goods that are high, resulting in relatively low services inputs into the exports of other sectors, as well as relatively low direct services exports. The 25 percent increase in TFP would mean a similar percentage increase in Peru’s GDP per worker (Figure 34). Eliminating these distortions could be additional to that in manufacturing, leading to a combined increase of around 35 percent in output per worker (see below).

- Finally, if the distortions in *manufacturing* could be eliminated, that sector’s productivity could increase by 62 percent. These distortions generally include financial and labor market frictions, or unfair advantages gained by certain types of firms or sectors, due to discretion that may effectively amount to subsidies. This increase in manufacturing productivity would mean an 8 percent gain in economy-wide productivity.

Behind the rigidities in product and factor markets are a set of “usual suspects” that prompt an inefficient allocation of factors between firms. These market frictions can arise for a variety of reasons:

³⁵ This case implies assumptions about Input-Output structure of the economy. See Fattal (2015).

Figure 34. Such an increase in productivity could more than double Peru’s output per worker



Source: Authors’ calculations using Caselli (2015).

taxes, labor market segmentation, other labor market rigidities, poor management, incomplete information, unions, lack of competition, and regulatory biases, among others.³⁶

Part III examines these “usual suspects” further and suggests ways to overcome the obstacles imposed by them:

- Section 5 looks at competition and regulation. Barriers to competition in upstream or downstream markets can distort prices of intermediate and final goods and lower returns to investment or to factors of production. Excessive or inefficient regulations can institutionalize rigidities and inflexibility in factor and product markets, create sectorial or geographical discretion and distortions, or create unfair advantages for select firms, entrepreneurs, or activities.
- Section 6 takes a deeper look at the labor market and the quality of education. Inflexible or segmented labor markets could cause significant labor misallocations. Low-quality human capital or weak education and training could reduce the supply of labor for higher value-added jobs.
- Section 7 highlights some issues that might restrict

³⁶ Jones (2015).

access to credit, because unequal, expensive, or insufficient access to credit could prevent firms from innovating and growing.

The last two sections explore further opportunities to reduce *misallocation* of factors to boost productivity in areas that are typically examined only in the context of *within-firm* productivity growth.

- Section 8 looks at patterns of international trade, since international trade is an important driver of productivity growth at firm level, through the spillovers offered by import of technologies from abroad. Trade also is a good instrument to correct misallocation of factors of production, as shown by the Peruvian manufacturing sector.
- Section 9 analyzes constraints to innovation since innovation is one of the strongest drivers of firm-level productivity growth in other countries. Innovation can also illustrate the benefits of removing distortions—especially if this means more equal access to inputs necessary for innovation.



Part III

Correcting misallocation
of resources to raise
productivity growth

5. Addressing regulatory and competition issues

Productivity has been growing, but with more efficient allocation of factors of production between firms, productivity growth would have been higher. Inefficient allocation of resources is reflected in the slow growth of firms and in allocation of labor to less-productive firms. In this part, we look at factors that may well have reduced aggregate productivity growth, under three areas: regulation and competition issues, labor market rigidities, and access to credit.

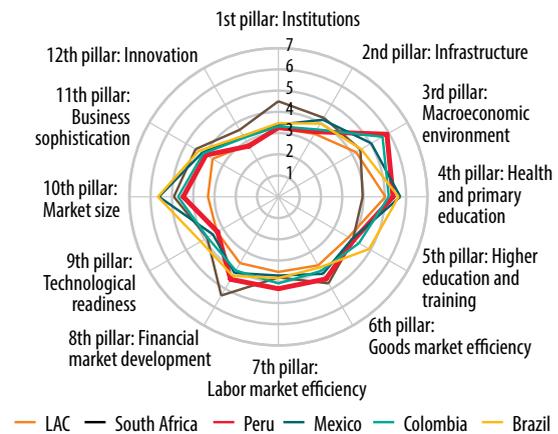
Competition drives efficient resource allocation, but may be restricted by regulations that unduly obstruct firms' entry, operations, and growth. Competition in the marketplace contributes to productivity growth: it shifts market shares toward more efficient producers (*between-firm*), and it induces firms to become more efficient so as to survive (*within-firm*).³⁷ Market competition can be enabled but also restricted by regulations. Regulations are key to addressing market failures and achieving other valid policy objectives. However, some regulatory options unnecessarily limit the number of competitors, facilitate anti-competitive practices, and lock in unfair advantages for particular firms, entrepreneurs, or activities. As a result, upstream markets—such as services—would not develop fully and downstream firms might be less competitive than their foreign rivals and less likely to compete globally.

Strong overall progress on competition policy and pro-competition regulation

The reforms undertaken in the last 20 years laid the foundations for Peru's solid competition policy. These structural reforms have introduced a best-practice competition legal framework, embedded competition principles in network sectors regulation, reined in state economic activity, and put in place a unique ex-post control mechanism for regulations

Figure 35. Peru scores higher than the LAC average on almost all pillars of the GCI

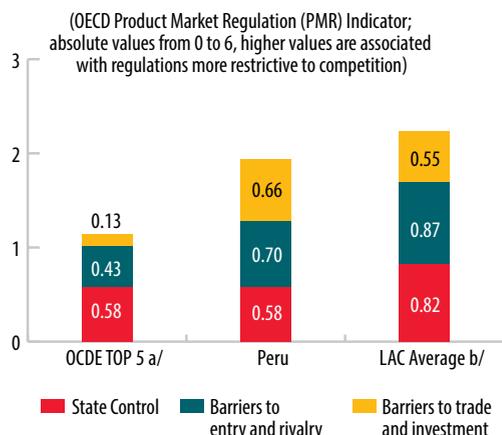
(absolute values from 0 to 7, higher values reflect more competitive policies and institutions)



Source: WEF, Global Competitiveness Report 2014–2015.

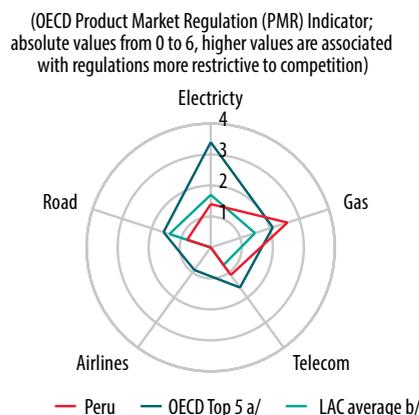
37 Ritzmuller and Licetti (2013).

Figure 36. Peru performs better than the LAC average on the overall product market competition agenda



Source: World Bank/OECD PMR data 2013–2014; Background paper prepared for this report by Licetti et al. (2015).
 Notes: a/ Top 5 OECD countries are the Netherlands, United Kingdom, Austria, Denmark, and New Zealand. b/ LAC countries include Argentina, Brazil, Chile, Colombia, Costa Rica, El Salvador, Honduras, Jamaica, Mexico, Nicaragua, and Peru.

Figure 37. But it lags behind in some sectors



Source: World Bank/OECD PMR data 2013–2014; Background paper prepared for this report by Licetti et al. (2015).
 Notes: a/ Top 5 OECD countries are the Netherlands, United Kingdom, Austria, Denmark, and New Zealand. b/ LAC countries include Argentina, Brazil, Chile, Colombia, Costa Rica, El Salvador, Honduras, Jamaica, Mexico, Nicaragua, and Peru.

that unduly burden private initiative. The Commission of Elimination of Bureaucratic Barriers of INDECOPI (Instituto Nacional de Defensa de la Competencia y de la Protección de la Propiedad Intelectual) can declare an existing public norm or administrative act as non-compliant with legal framework (illegal) or unreasonable, and sanction the responsible institution or public servant.

Peru performs well on competitiveness indexes.

On the Global Competitiveness Index (GCI), Peru’s performance in the macroeconomic environment is strong even relative to the OECD average (Figure 35). Financial market development in Peru outperforms that of major LAC countries such as Brazil, Colombia, Mexico, as well as the LAC average. Peru has very good performance in improving its business regulations, as shown by the overall ranking in *Doing Business*, as it has been steadily improving its overall distance to frontier score from 67.2 in 2010 to 72.11 in 2015 (Figure 40). According to *Doing Business 2015*, Peru ranked 35th out of 189 economies and 2nd in LAC on ease of doing business, showing impressive progress from 71st in the world in 2006.

Peru has made great strides toward OECD standards in competition policy.

On product market regulation (PMR) indicators, Peru compares well in areas of pro-competition network sector regulation, limited state economic activity, and general openness

to trade (Figure 36). Peru’s extent of state control is comparable to the OECD’s, consistent with the government’s policy of encouraging growth through enabling private initiative. However, as discussed just below, barriers to competition are hindering well-functioning markets in important service sectors. Although product market regulations in Peru are generally conducive to competition, for example in the network sector (electricity, airlines, and telecommunications, Figure 37), these lessons learned will need to inform regulation of emerging network sectors, such as gas and payment systems. Despite having liberalized economy for trade, some barriers to FDI and trade facilitation remain.

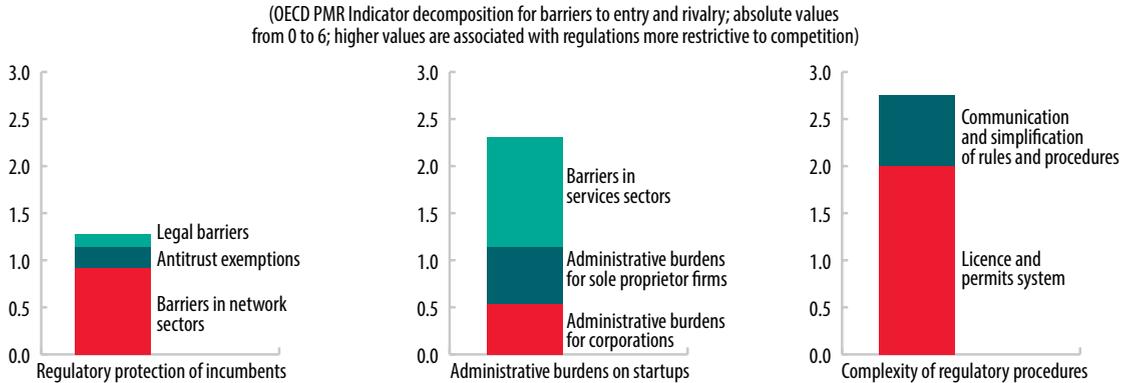
But some barriers still hamper product market competition

Some services sectors remain shielded from competition.

Barriers to entry and rivalry are still restrictive to competition in certain services sectors (Figure 38). Unlike in Chile, Mexico, and Colombia, professional service providers in Peru self-regulate the entry conditions for new service providers. Professional services (such as lawyers, accountants, architects, and engineers) are licensed by professional bodies and it is a mandatory requirement to be a member of the association. Also, there are more tasks than in the OECD on which these professionals have a monopoly or shared monopoly right. By some estimates, removing

5. Addressing regulatory and competition issues

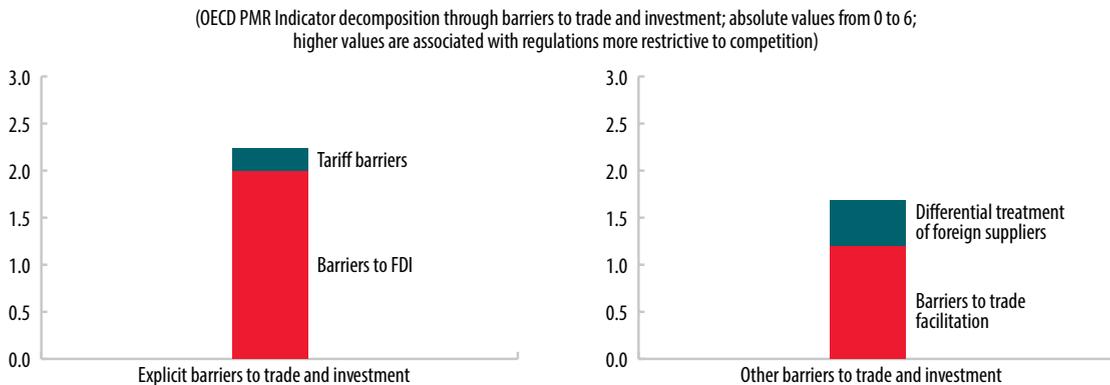
Figure 38. Complexity of regulatory procedures, regulatory protection of incumbents, and barriers in services top the list of barriers to entry and competition



Source: World Bank/OECD PMR data 2013–2014; Background paper prepared for this report by Licetti et al. (2015).

Note: The figure depicts decompositions of PMR indicator for barriers to entry and competition. The larger the share of a barrier is, the more restrictive this barrier is to competition. For example, in complexity of regulatory procedures, the license and permits system is a stronger restriction on competition than are communication and simplification of rules.

Figure 39. Barriers to FDI and trade facilitation issues have hampered competition in the tradable sectors



Source: World Bank/OECD PMR data 2013–14; Background paper by Licetti et al. (2015).

Note: The figure depicts decompositions of PMR indicator for trade and investment. The larger the share of a barrier is, the more restrictive this barrier is to competition. For example, in explicit barriers to trade and investment, barriers to FDI are a stronger restriction on competition than tariffs.

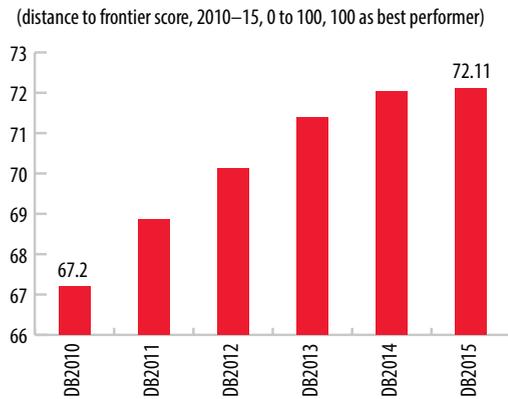
these restrictive regulations would increase value added in 14 Peruvian sectors that use professional services intensively by 0.8 percent, equivalent to 0.2 percent of GDP.^{38,39}

38 Barone and Cingano (2011).

39 "Intensive use" is defined as an above-average technical coefficient with respect to professional services in the input-output matrix. The 14 sectors are chemical and chemical products; electric machinery and apparatus; information service activities; other transport equipment; electricity, gas, and water supply; transport and storage; post and telecommunications; finance and insurance; renting of machinery and equipment; health and social work; public administration; other business activities; other community social and personal services; and professional, scientific, and technical activities.

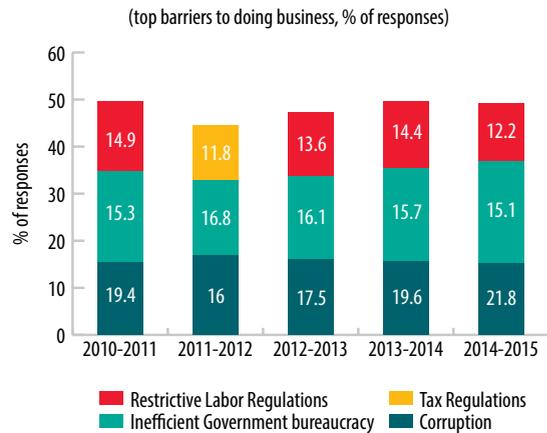
Some barriers that limit trade and foreign entry, hamper competition in the tradable sectors. Barriers to trade and investment are concentrated in FDI regulations and trade facilitation (Figure 39). Peru has eliminated tariff barriers and ensures foreign suppliers' equal treatment. But it lags behind in trade facilitation (see also Section 6): it has not agreed with other countries on mutual standard recognition nor equivalence of regulatory measures in key services sectors such as manufacturing energy, distribution, maritime and air transport, telecommunications (fixed and mobile), insurance, banking, and hotels and restaurants. Removing these barriers would

Figure 40. Peru has shown strong progress on overall Doing Business indicators ...



Source: Doing Business (World Bank).

Figure 41. ... but regulation remains a key problem for business



Source: Executive Opinion Survey 2014 (World Economic Forum).

improve competition in the tradable sectors and help increase imports and exports—key elements for Peru’s productivity growth (see Section 7).

Government bureaucracy, labor market regulations, and implementation and enforcement of the legal framework remain problematic

Barriers to entry, and high costs of operation and expansion hold down the growth of small and medium firms. The share of firms reporting business licensing and permits as a major constraint contributes to overall complexity of regulatory procedures and is considerably higher in Peru, at 20.4 percent, than the OECD average of 5 percent.⁴⁰ Medium firms are most affected in their ability to grow, expand, and innovate. Nearly 30 percent of such firms identified business licensing and permits as a major constraint, against 17 percent of small firms and 15 percent of large firms. The most recurrent obstacle had to do with procedures “for a technical excuse,” meaning obstacles caused by a public agency that blocks a specific authorization or report in the procedures. Administrative burdens on startups are reflected mainly in barriers in the services sector.

More progress can be achieved on key regulatory areas, such as the labor market and government

bureaucracy. Peru’s performance on structural issues, business sophistication, and innovation is weak. Moreover, inefficient government bureaucracy and corruption have been consistently ranked as top constraints for firms (Figure 41).^{41,42} Importantly for productivity, labor regulations have been consistently among the top three barriers to doing business (Section 8).

Bureaucratic barrier—often imposed by subnational governments—stifle firm entry, growth and competition

Illegal or unreasonable implementation of the law does not only obstruct investments and raise costs for businesses but also harms competition. Estimations by INDECOPI show that bureaucratic barriers generate an estimated cost of 0.1 percent of GDP for citizens and companies either directly or indirectly affected.⁴³ The majority of these cases restrict competition to a significant degree by (i) limiting the number of firms in the market or inhibiting private initiative, (ii) imposing rules on modes of service provision that increase the business risk or facilitate anti-competitive practices, or (iii) instituting rules that discriminate against certain companies.

41 World Bank Enterprise Surveys 2010 and World Economic Forum Indicators 2015.

42 WEF 2014–2015.

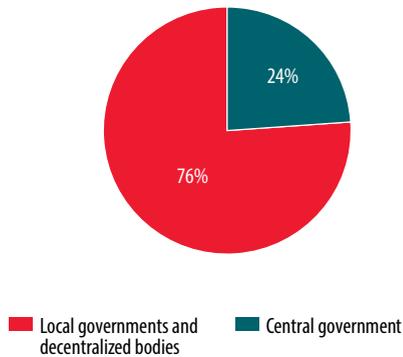
43 INDECOPI Observatorio de Mercados (2014), *Midiendo el costo económico potencial de las barreras burocráticas en el Perú*, available at <http://www.indecopi.gob.pe/repositorioaps/0/0/je/publicacionesqs/ObservatorioCostoBarrerasBurocr%C3%A1ticas2013.pdf>

40 The average in LAC is 18.4 percent (Enterprise Surveys 2010).

5. Addressing regulatory and competition issues

Figure 42. Most complaints about bureaucratic barriers are against bodies other than the central government

(% out of 613 processed complaints, 2013)

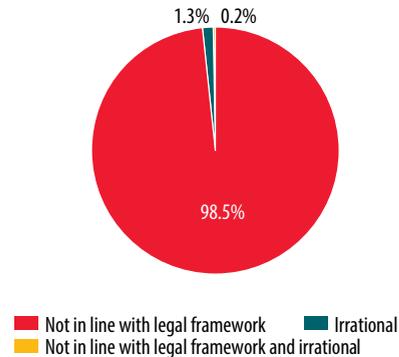


Source: INDECOPI 2013.

Note: processed complaints are firms' claims about a bureaucratic procedure that has been declared illegal or irrational by INDECOPI.

Figure 43. Most of the bureaucratic barriers at the subnational level are not in line with the legal framework

(out of 613 processed complaints, 2013)



Source: INDECOPI 2013.

For example, between 2013 and 2014, the Transport Ministry effectively closed the market for further entry on 50 different interstate bus routes.

Many bureaucratic barriers were imposed by subnational government (especially at the municipal level) or other non-central bodies.

Important aspects of market access and investment are the responsibility of subnational governments, most often municipalities. Procedures relating to company startup, licensing or permits, inspections, and access to land, for example, commonly require procedures at national and subnational levels, even when subnational technical implementation capacity may be weak. INDECOPI processed 613 complaints on bureaucratic barriers in 2013; of these, 76 percent were on barriers imposed by local governments and decentralized bodies. Most of these barriers were classified by INDECOPI as non-compliant with the legal framework (Figure 42 and Figure 43).⁴⁴ The

top reasons for the complaints were restrictions to operation of new transport businesses, suspension of procedures after initial commencement of the registration process, and illegal requirements for operating licenses. The number of complaints increased dramatically in 2014: through July, more than 1,200 bureaucratic barriers were declared non-compliant with the legal framework and/or unreasonable.

Whether imposed by national or subnational bodies, the majority of cases of undue implementation of legal frameworks affect sectors that are critical for the development of local markets.

In 2013, 70 percent of the cases of undue secondary norms, temporary dispositions, or general administrative acts affected key sectors for the development of local markets such as transport, telecommunications, retail, construction/real estate, or tourism, limiting the provision of adequate (higher-quality and lower-cost) services, and efficiency-enhancing labor allocation.⁴⁵ For example, the second mobile operator is constrained in its network expansion as US\$80 million in investments were stalled when municipalities denied it permits to install antennas. As of November 2013, 10 out of 21 larger municipalities had no procedure in place to authorize, for example, telecommunication infrastructure. And almost one-third of all municipalities did not comply with the legal framework on operational permits for commercial

⁴⁴ The database includes claims identified at the national level—the headquarters Commission to Eliminate Bureaucratic Barriers (Comisión de Eliminación de Barreras Burocráticas, CEBB)—and 12 subnational CEBBs. It is classified by sector (14), illegal or unreasonable, and type of barrier. Barriers deemed illegal include suspending authorizations to provide passenger interstate road transport in the national road network; requiring proof of a minimum capital of \$1.2 million to offer public transport for passengers; and requesting presentation of a marketing, financial, and administrative feasibility study for any route starting or ending in Lima. Barriers deemed unreasonable include requiring transport companies to have authorized land terminals and stations at both ends of the route and commercial stops to access and remain in the sector; requiring vehicles to be no more than three years old to access the market for public transportation of goods; and restricting opening hours.

⁴⁵ INDECOPI (2014).

establishments in 2014.⁴⁶ These local barriers raise the cost of doing business and hamper competition.

The mechanisms in place to enforce the removal of bureaucratic barriers have been limited. The scope of INDECOPI's decision as a result of a particular complaint is limited: INDECOPI can only order the government agency to revoke the specific administrative action declared a bureaucratic barrier. As other parties would need to initiate a complaint themselves and wait for their case to be resolved, the same administrative action has been declared illegal or unreasonable more than 140 times.⁴⁷ Further, the Free Competition Commission at INDECOPI plays no real role in revising new regulations on their impact on competition nor in advocacy for pro-competition regulation in general. Finally, a formal coordination mechanism between the CEBB and this Commission is lacking, despite the obvious links among the issues covered by both.

to local development affect investment, entry, and competition. There is currently no legal mechanism that can effectively address this issue with an ex ante approach. Therefore, based on best international practice, a mechanism to ensure that the potential regulatory impact on competition is taken into account could be a regulatory option to check the quality of regulations issued by the executive. Covering a range of regulatory goals, this system should assess (as part of the potential impacts of regulations) the specific effects that the regulation could have on competition and markets. Once the general RIA regime is enacted, operating guidelines should be promulgated to provide policymakers with criteria for conducting the competition assessment within RIA.

The first steps to improve competition: dealing with discretion at the subnational level and assessing competition more generally

Enhancing INDECOPI's power will be critical to more effectively remove barriers to market access and competition. Actions should include empowering INDECOPI to achieve the objective of effectively removing illegal and/or unreasonable bureaucratic barriers; granting INDECOPI the legal power to analyze bureaucratic barriers that affect competition; setting a legal limit on public entities for challenging INDECOPI's declaration of an illegal and/or unreasonable bureaucratic barrier before the judicial courts; and giving INDECOPI, as the competition authority, the power to issue ex ante opinions on the potential impact on competition of regulations (issued by the central government) in key economic sectors as well as on draft concession contracts and PPPs.

Peru would also benefit from introducing a tailor-made and well-implemented regulatory impact assessment (RIA) system on competition. Barriers

⁴⁶ For more details on the decentralization process and challenges, see Rendon et al. (2015), a background paper prepared for this report.

⁴⁷ This is the number of times a bureaucratic barrier (the Ministry of Transport has kept suspended passenger interstate road transport on the national road network) has been declared illegal or unreasonable in 2013 and 2014 (up to August). INDECOPI (2014), p. 22.

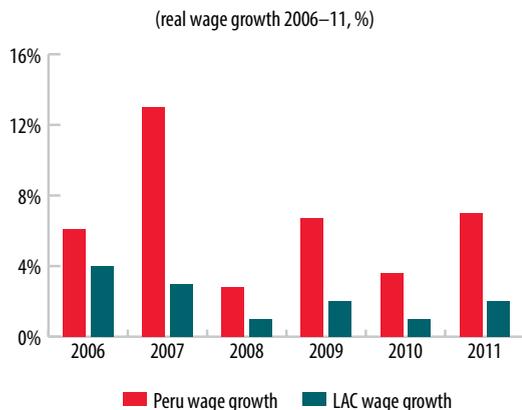
6. Streamlining the labor market and building skills

A well-functioning labor market is important for supporting growth and productivity. There is evidence that restrictive regulations impede the efficient allocation of labor to most productive firms. In Peru, these relate mostly to firing restrictions, as well as non-wage labor costs. Making the labor market more flexible and reducing excessive costs would help increase formality and overall productivity of the economy. Reforms in this direction would also improve the well-being of Peruvian workers, who would be able to better benefit from their employment and receive higher returns on their education.

Wages kept up with productivity growth, supported by structural shifts

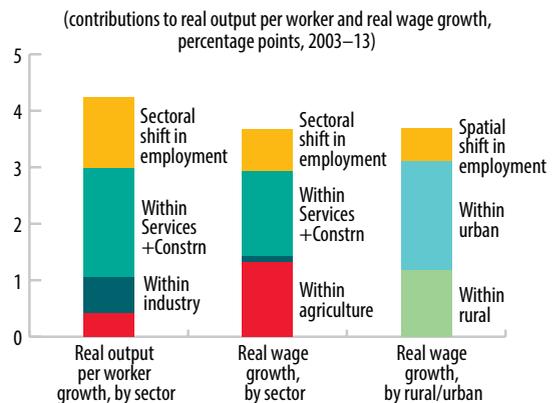
Growth over the last decade has served workers well. In 2003–13, despite higher labor force growth than most regional and upper-middle-income comparators (averaging 2.4 percent a year), job growth kept pace. Supported by rapid productivity growth averaging 4.3 percent since 2013, Peru has seen average real wage earnings increase by 3.7 percent a year. Over the period for which there is comparable data (2006–11), Peru’s real wage growth

Figure 44. Peru’s workers have seen real wage growth above the LAC average



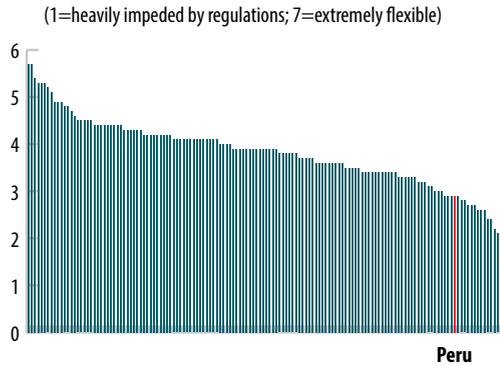
Source: Authors’ estimates from WDI; Encuesta Nacional de Hogares (ENAH), based on background paper prepared for this report by Ruppert Bulmer et al. (2015).

Figure 45. Productivity and wage advances supported by shifting sources of employment



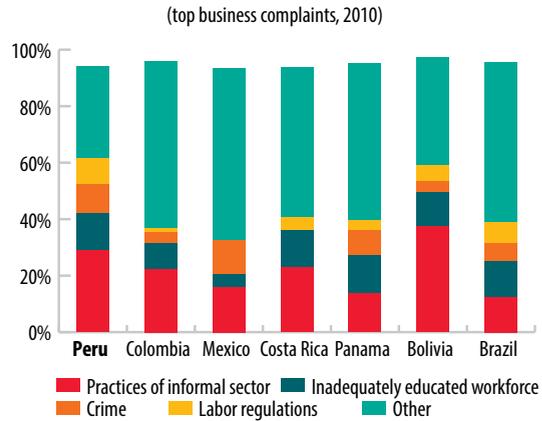
Source: Authors’ estimates from WDI; ENAH, based on background paper prepared for this report by Ruppert Bulmer et al. (2015).
Note: Industry excludes construction.

Figure 46. Labor regulations are more restrictive in Peru than in other countries



Source: Authors' calculations; Background paper by Quijandria et al. (2015), based on The Global Competitiveness report 2014–15.

Figure 47. Labor regulations also figure more in business complaints



Source: Authors' estimates from Enterprise Surveys.

of more than 6 percent a year far exceeded the LAC regional average of 2.1 percent a year (Figure 44).

Productivity and wage growth has been aided by large structural shifts in the sources of employment.

Chief among these shifts has been the decline in agriculture and growth in the non-tradables sector. Over 2003–13, about 600,000 jobs were shed in agriculture (about 14 percent of agricultural jobs), and in their place about 3.4 million net nonfarm jobs were created, the majority in the non-tradables sector (services and construction).⁴⁸ Large construction projects (predominantly nonresidential) almost doubled construction jobs over the period, while the generalized rise in incomes stimulated the economy's demand for services, with the largest job gains coming from commerce, government, and transport and communications. In total, the agriculture sector's share of employment fell from 35 percent to 25 percent, while that of services and construction increased from 56 percent to 64 percent. With the average wage in the services and construction sector more than three times that of agriculture, this shift has been strongly wage enhancing (Figure 45).⁴⁹

Nevertheless, earnings have been dampened by the share of workers engaged in lower-productivity

48 The industry of employment is determined by the worker's declared "primary occupation."
49 The average annual wage growth by sector during 2003–2013 was 8.2 percent in agriculture, 0.4 percent in industry, and 2.1 percent in services and construction. The average share of employment has been 16 percent for agriculture, 13 percent for industry excluding construction, and 71 percent for services and construction.

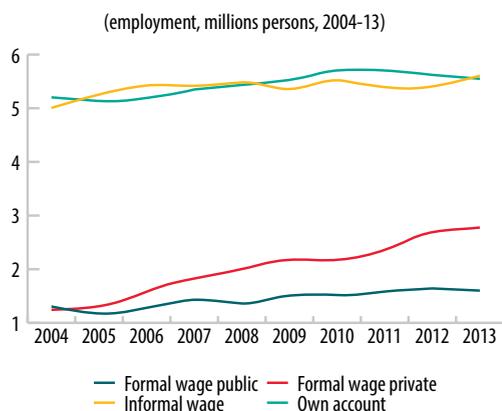
informal employment. Peru's informal sector is large relative to comparators, and productivity and wages among informal workers are a fraction of that among those having formal contracts. Transitions of workers from informal to formal employment are impeded on the supply side by still-large educational divides among workers, and on the demand side by costly and restrictive labor market regulations, holding down overall employment growth. More generally, worker productivity and wage growth are also impeded by quality of skills, the result of an educational system that has both underinvested and lacked appropriate mechanisms to ensure that skills are pertinent to private sector needs.

Labor demand is stifled by a costly, restrictive labor code

Labor regulations are more restrictive in Peru than in most of LAC. The ease of hiring and firing index ranks Peru as 12th of 15 LAC countries on simplicity of hiring new or firing current employees. The only countries that trail Peru are Brazil, Argentina, and Venezuela (Figure 46). Underlying this figure is a highly prohibitive system of restrictions to firing, which severely limits dismissals for economic reasons and in which dismissal outside of economic reasons must be through negotiated compensation. Because these controls do not apply to small enterprises, they are disincentives for businesses to grow beyond a certain threshold. In addition, at over 35 percent, Peru's tax wedge (the difference between the labor costs to the employer and the take home pay of the employee) is among the highest in the region,

6. Streamlining the labor market and building skills

Figure 48. Formal job creation led by the private sector



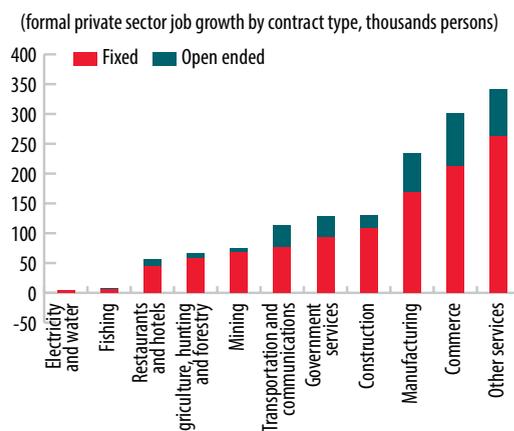
Source: Authors' estimates on ENAHO, based on background paper prepared for this report by Ruppert Bulmer et al. (2015).

further reducing incentives to hire. More generally, labor regulations are among the most difficult obstacles for businesses in Peru. While they feature in all competing Latin American countries, they figure more prominently in Peru (Figure 47).

Job growth in the formal sector is shackled by restrictive dismissal regulations. While regulations for hiring are almost non-existent, restrictions to firing are highly prohibitive. The labor code allows employers to dismiss workers for economic or technical reasons but they require authorization from third parties (Ministry of Labor or Judges), which effectively hamper necessary adjustments of the labor force. Section 4 discussed the problem of stunted employment growth at the firm level, which is linked to misallocation of labor and rigidities in the labor market—especially the firing restrictions. Over 2004–13, the formal sector increased from around 1.6 million jobs to about 3.2 million jobs (from around 11 percent of overall employment to 20 percent). More jobs were created in the formal sector than the informal, and the vast majority of those formal jobs were created by the private sector (Figure 48). However, more than three-quarters of that job growth came from fixed-term employment (Figure 49). Fixed-term hiring has facilitated more efficient labor allocation, but cannot fully compensate for a rigid labor code. Thus, greater flexibility in hiring procedures will continue to be needed to allow businesses to better adapt their labor forces to the needs of their businesses. Recent reforms are a step in the right direction, although they do not resolve this problem.⁵⁰

50 The recent Presidential Decree 013-2014-EF provides an

Figure 49. The bulk of formal private sector job growth came under fixed-term contracts



Source: Authors' estimates from ENAHO panel 2007–11, based on background paper prepared for this report by Ruppert Bulmer et al. (2015).

Restrictive labor regulations encourage the growth of the large informal sector, which is much less productive than the formal

A large portion of workers are in the informal sector, where productivity is one-sixth that of the formal sector. Restrictive labor code, especially where it concerns firing restrictions and non-wage labor costs, contributes to high levels of informality. Comparable estimates of informality outside of agriculture suggest that Peru has one of the highest levels of informality in the region.⁵¹ Informality is generally high in Latin America but Peru's level of informality outside of agriculture, at 70 percent, is above Mexico's and Colombia's (Figure 50). Both output per worker and wages are far lower in the informal sector. Estimates put the wage differential in 2007 at three to one, while the productivity differential for the same year is estimated at six to one (Figure 51).

operational definition for the "economic motives" that could trigger collective dismissals (a definition previously missing in the Legislative Decree N 728). Another draft law (4008-2014, still to be approved by Congress) proposes a reduction in threshold for collective dismissals from 10 to 5 percent of employees.

51 From ILO 2012 (http://laborsta.ilo.org/applv8/data/INFORMAL_ECONOMY/2012-06-Statistical%20update%20-%20v2.pdf). Informal employment is defined as the sum of persons whose main job was in the informal sector (non-registered businesses) or was informal (a job lacking basic social or legal protection, whether in the informal sector or otherwise). Peruvian authorities have a similar estimate of informal employment: they calculate the share of informal employment at 77.2 percent in 2009 (74.3 percent in 2012), referring to the total number of informal jobs in the formal sector (without social contributions by employers), informal companies, or the household sector, see INEI (2014).

Figure 50. Peru has a high level of informality relative to LAC

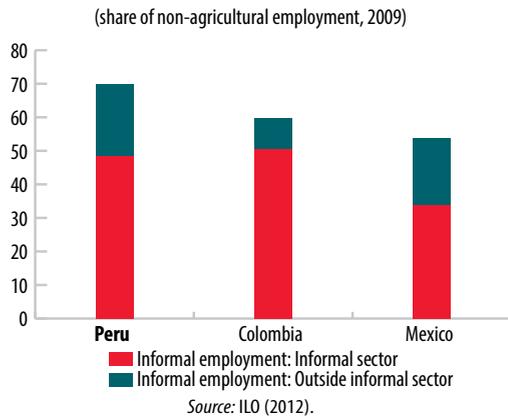


Figure 51. The worker productivity differential between formal and informal sectors is 6 to 1

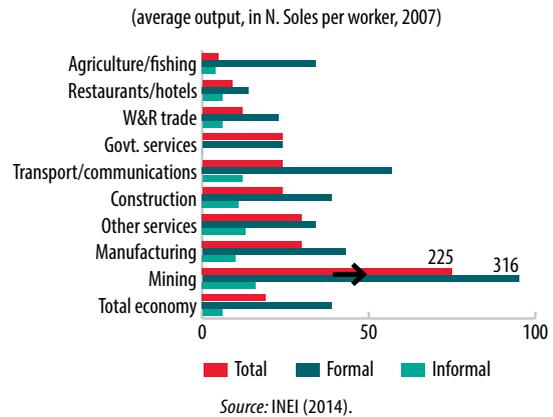


Figure 52. Transitioning out of informality is difficult

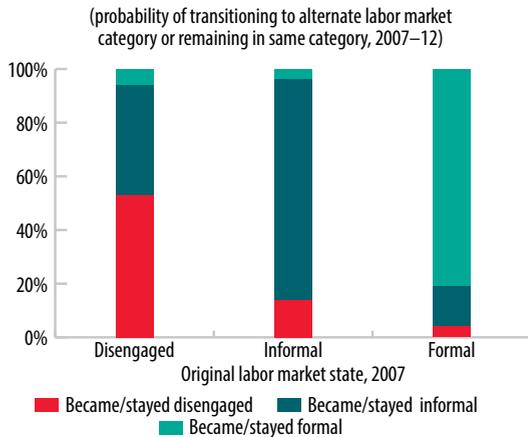
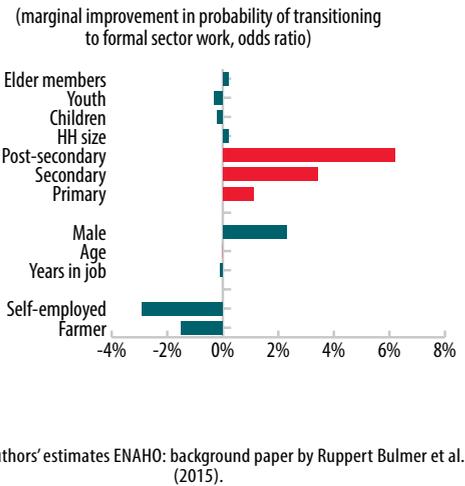


Figure 53. Education improves the odds of formal employment



Informal employees have little chance of moving to formal employment. Over 2007–12, less than 4 percent of informal workers made the shift to formal employment (Figure 52), versus 13 percent exiting the labor force and 3 percent becoming unemployed in the space of 12 months. These transition rates for informal workers to inactivity or unemployment are double the rates in Brazil or Mexico.

Part of the difficulty with transitioning relates to sharp differences in educational achievement—but wage differences are significantly driven by the nature of informal work itself. Informal workers average 4 years less of education than formal workers—9.2 years versus 13.4. One of the determinants important for transitioning from informal to formal work is education, specifically

post-secondary, which remains almost exclusive to those working in the formal sector (Figure 53). But while education remains paramount for improving formal-sector employability of workers, it does not fully explain the limited transitions from informality, nor the differences in productivity between informal and informal workers. Other things being equal, a worker with higher education has a probability only 6 percentage points higher of transiting into a formal job than a worker without education. Other factors such as age, gender, and the size of the household also influence transitions into formal jobs, but their effects are even more muted. Moreover, regression analysis of the wage gains from transition to formality suggests that a relatively large portion of the observed wage differential (and thus, potentially, the productivity differential) cannot be explained by differences in worker

6. Streamlining the labor market and building skills

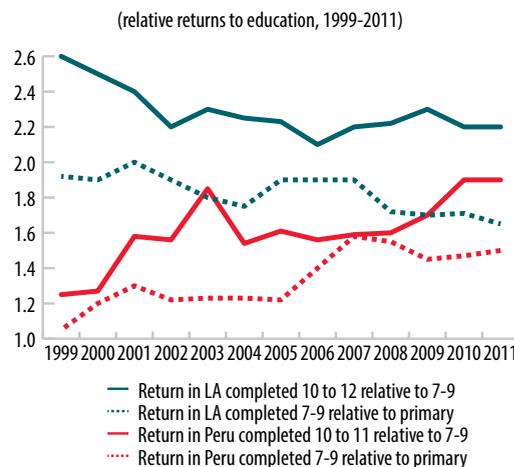
characteristics. Rather, it reflects a range of features of informal work that lower the productivity and wages of those engaged there. For example, informal sector workers who transitioned to the formal sector over 2007–11 (and controlling for changes in sector/region of employment), experienced a 54 percent increase in their wage, not associated with any change in the worker's underlying characteristics. That wage gap cannot be attributed to productivity differentials related to the individual but to the nature of informal work itself.⁵² Precarious transitions between formal and informal employment highlight the importance of making sure young people have access to the formal sector jobs. Otherwise, they might become caught by the trap of low productivity jobs, with little chance of moving to high-productivity jobs in the formal sector. However, the evidence described here also points to the limits of supply-side interventions in driving more rapid transitions from informal to formal jobs, and the importance of addressing demand-side constraints.

Advancing access to and quality of post-primary education is becoming increasingly important

While most countries in LAC have experienced declining returns to education, returns to secondary and post-secondary skills in Peru have continued to rise. There has been a substantial rise in the educational attainment of the Peruvian labor force over the past two decades. School attendance rates to age 12 are above LAC regional averages, Peru has achieved near-universal primary education, and secondary and tertiary education completion rates also surpass LAC comparators. Despite this increase in supply, the demand for secondary and tertiary educated workers continues to outpace supply. As shown in Figure 54, relative returns to education in Peru have been increasing, unlike in the rest of the LAC region. Although the good news is that the demand for higher skills remains strong, the flip side is that higher skills may constrain stronger growth and employment creation (particularly in the services sector). Ensuring that businesses can continue to acquire needed technical skills to expand will require both continued advances in post-primary education and increased quality.

⁵² The increase in wage earnings associated with transition to formality in 2007–11, controlling for worker characteristics, varied from 22 percent in utilities to 168 percent in mining, and averaged 52 percent economy-wide (according to authors' estimates on ENAHO 2007–11 as reflected in the background paper prepared for this report by Ruppert Bulmer et al., 2015).

Figure 54. Peru has seen relative returns to education increase, unlike the rest of the region



Source: Authors' calculations and background paper prepared for this report by Kudó and Székely (2015).

Low educational quality inhibits productivity growth.

Various sources paint a picture of low quality of education relative to comparator countries.⁵³ A cross-country comparison of results from the Program for International Student Assessment (PISA) suggests that Peru's quality of education is deficient across the board. Only a third of Peruvian 15 year olds exhibit proficiency in reading comprehension, while only a quarter demonstrate adequate mathematical skills (Figure 55). Peru's government has moved to address many of the problems associated with basic education,⁵⁴ including devoting greater resources to education (Figure 56). Despite this, a comparison of Peru with other LAC countries and other regions shows that the level of both public and private investment in higher education was below the level corresponding to Peru's income, considered in aggregate and in per capita terms.⁵⁵

Technical training programs do not seem to train workers for private-sector needs. Many public vocational training programs, which account for 30 percent of continuing training, have underinvested in

⁵³ Castro and Yamada (2012).

⁵⁴ Reforms center on increasing public resources for education, making greater use of public-private partnerships for improving education infrastructure, instituting meritocratic career advancement for teachers based on continuous evaluation, and revamping regulations for better management of the system (see the background paper prepared for this report by Yamada et al., (2015)).

⁵⁵ From background paper prepared for this report by Botero (2015), citing World Bank (2007).

Figure 55. Peru's PISA results point to low achievement across the board

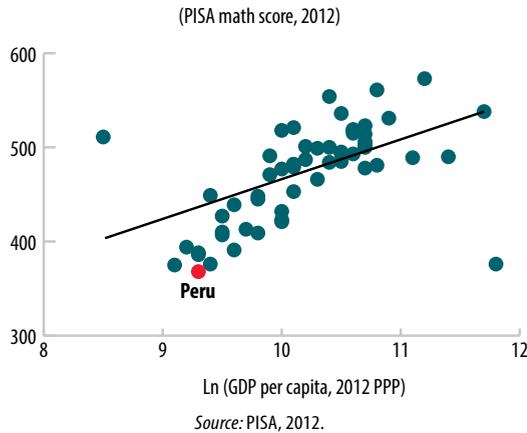
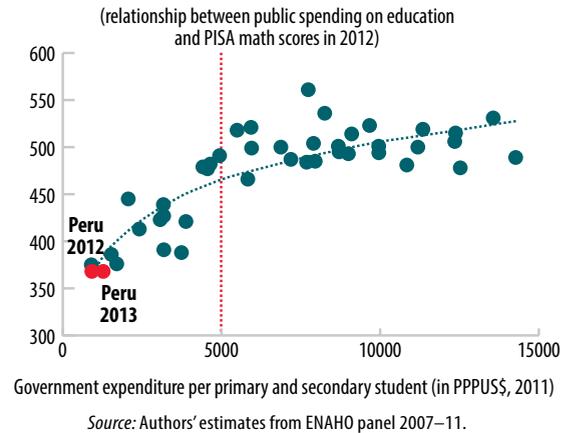


Figure 56. Peru's public spending on education is low



equipment, and they suffer from problems of quality and relevance to labor-market needs. Much of the vocational training for mining workers, for example, does not meet international industry standards. As a result of the poor coordination between educational training and private-sector requirements, the average internal rate of return to professional degrees in public and private technical institutes are low. Firm-level training has a better record for addressing specific firm needs, but the incidence is low, in part because firms find few incentives for investing in training that can be carried away to new jobs.⁵⁶

Removing distortions will help workers acquire more relevant skills and allocate them to the most productive jobs with the highest earning potential

On the supply side, improving access to quality basic and vocational education is important for reducing the obstacles to transitioning to higher-wage work, whether in the formal sector or even within the informal sector. This involves higher public spending on education and training, and greater monitoring and evaluation of all education programs, including preparing students for higher education exams, and better matching technical training supply to private sector needs. Based on experience in other countries, in addition to policies that provide an adequate system of labor regulations, active policies should include creating a contestable market for training and active labor-market programs where public and private

providers can compete on the basis of appropriate contracting and payment systems; removing the constraints that affect investment in training by firms; and diversifying sources of funding.⁵⁷

On the demand side, an appropriate, functioning balance needs to be struck between worker protection and job creation. The fact that most workers are employed in the informal sector—outside labor regulations and unable to enjoy the benefits—suggests that overburdening labor policies are in fact reducing protection to workers by reducing coverage of formal policies, contrary to the intended aim. It seems appropriate to reform the regime to offer a consensually defined level of security to employees while making the regime attractive enough to include the majority of workers.

This increased flexibility and reduced costs of labor regulations should be accompanied by redundancy arrangements. In terms of adding flexibility and easing job mobility, hiring and firing regulations could become less costly and require less administrative discretion in firing approvals, including collective and individual dismissals. Making temporary contracts more mainstream and incorporating benefits would also help. Finally, reducing the non-wage costs of labor—which are very high by international standards—would also encourage formal employment.

⁵⁶ Background paper prepared for this report by Yamada et al. (2015).

⁵⁷ See the background papers prepared for this report by Ruppert Bulmer et al. (2015) and Yamada et al. (2015) on continuous training.

7. Improving access to credit for enterprises

An efficient financial sector is central to productivity growth

Efficiently allocated credit allows firms to pursue economical investments. Capital investment is not only a direct factor of production, but it also increases total factor productivity (Figure 57). Higher returns to capital that are associated with increases in total factor productivity, could also reward higher investment.⁵⁸ An efficient, deep financial sector intermediates between savers and borrowers to mobilize and pool savings and channel them to productive borrowers.⁵⁹ It also helps to reduce the costs and risks associated with savings and investments. It fosters capital accumulation, contributes to better resource allocation in the economy, realizes economies of scale, and overcomes investment indivisibilities.

But Peru's credit to the private sector seems low given the high savings rate and income level. Peru has a relatively high savings rate, comparable to that of other successful MICs during their high growth periods (as discussed in Section 1) and relative to its income (Figure 58). But the volume of credit to the private sector is lower than predicted by the country's level of development (Figure 59). This suggests that there may be inefficiencies in how the financial sector

is allocating and intermediating resources between savers and borrowers: since only intermediated savings can be used as credit, the extent to which savers use the financial system is important. As illustrated in Figure 60, domestic savings in the financial system are lower than would have been predicted by the level of savings alone.

Use of the financial system by savers is low. This is reflected in lower deposits than expected for the savings rate (Figure 60): only 29 percent of the population have savings accounts, lower than in Bolivia (42 percent), Colombia (39 percent), Ecuador (46 percent), and Chile (63 percent).⁶⁰ This was not due to lack of information, as 72 percent of respondents to a recent survey had knowledge about savings accounts.⁶¹ More than half the people surveyed did not use or own any financial product at all, while only 22 percent kept savings in the financial system (Figure 61).

Access to credit varies by firm size and geographically

Although formal businesses do not report access to finance as a major constraint, cost of credit is high for SMEs. Peru ranks 12th (out of 188 countries) in

⁶⁰ Global Findex Database: <http://datatopics.worldbank.org/financialinclusion/>.

⁶¹ Survey measuring financial capacities in the Andean countries. Corporación Andina de Fomento Comisión de Eliminación (CAF) (2015). Encuesta de medición de las capacidades financieras en los Países Andinos. Informe comparativo 2014.

⁵⁸ Caselli (2005).

⁵⁹ Acemoglu and Zilibotti (1997).

Figure 57. Capital and productivity show a positive relationship

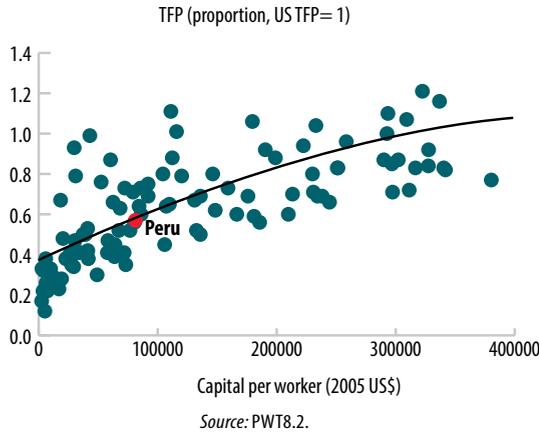


Figure 58. Peru's domestic savings are high for its income level

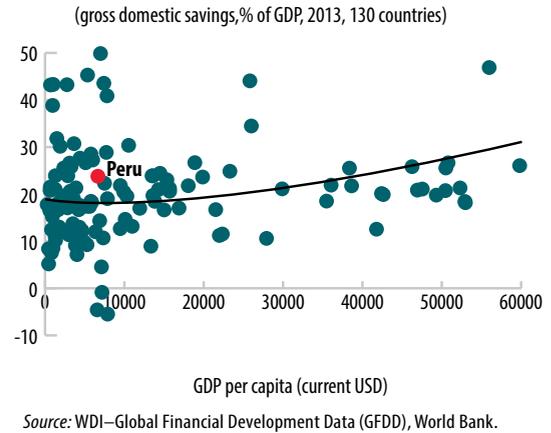


Figure 59. Low credit to private sector, compared to income per capita

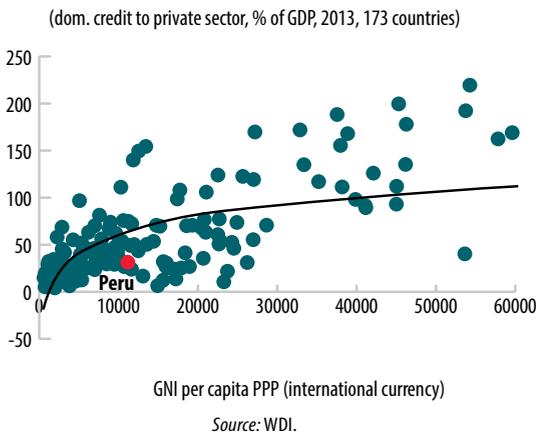
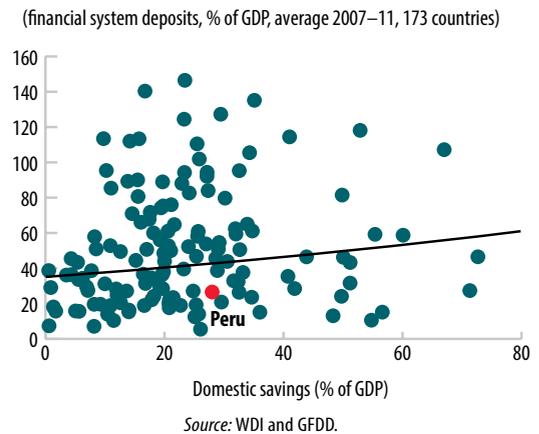


Figure 60. Low deposits in the financial system, compared to savings



the Doing Business indicator of ease of getting credit; the percentage of firms with a bank loan or credit line is higher in Peru than in comparator countries (60 percent versus the LAC average of 45 percent); only a fraction of firms report access to finance as a major constraint (8.5 percent, against a regional and global average of around 30 percent). However, the cost of credit is thought to be high, especially for small and medium firms. For those micro firms who had access to the banking sector, the annual cost of credit was above 30 percent of the loan amount in 2014 and for those without access it could be much higher.⁶² Moreover, given the high rate of informality,

the financial statistics may underestimate issues of access and the cost of credit. Although measurement is difficult, there is evidence that effective borrowing rates are high for informal firms outside of the formal financial system.⁶³ For the financial system as a whole, despite falling steeply from the early 1990s, the real lending rate was 16 percent in 2013—high compared with other economies at similar levels of development (Figure 62).⁶⁴ The fact that large corporates can obtain credit at low competitive

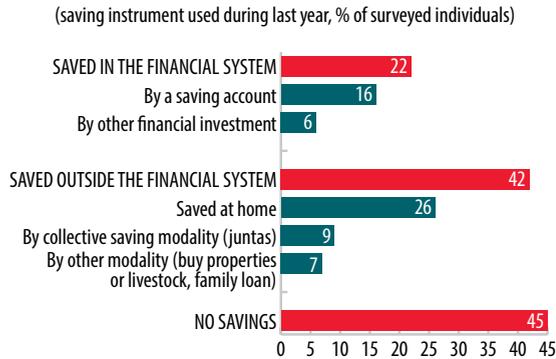
62 Choy et al (2015) measure the average cost of credit by estimating a rate that includes all the payments associated to loans obtained by firms, mainly interest-rate payments and other commissions, as a percentage of the loan amount.

63 A survey by the association of banks (ASBANC) found that the annual effective rate in such loans could be as high as 400 percent. Informal loans also can involve pledges, whose value can go from 1.3 to 5 times the value of the loan. This segment is not small, as informal activity accounts for about 20 percent of GDP and units of production categorized as informal were 87 percent of all units of production in 2012, according to INEI (2014).

64 Corresponds to the average lending interest rate, adjusted by the GDP deflator, as reported by WDI Data, from World Bank.

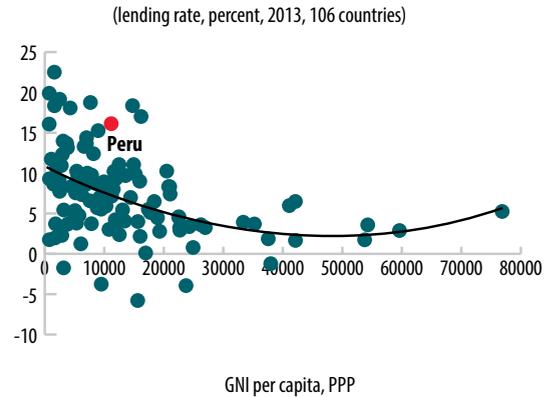
7. Improving access to credit for enterprises

Figure 61. Most people do not use the financial system for savings



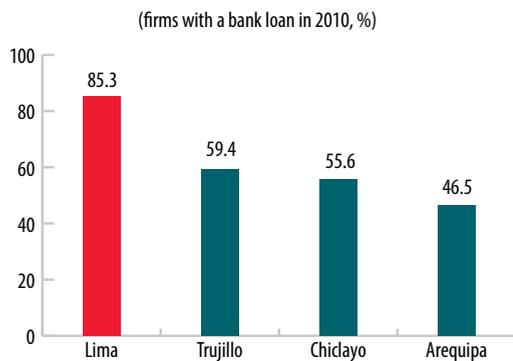
Source: Survey measuring financial capacities in the Andean countries, CAF (2014). Note: 1,210 individuals were surveyed in 2013.

Figure 62. High real interest rates, compared to income per capita



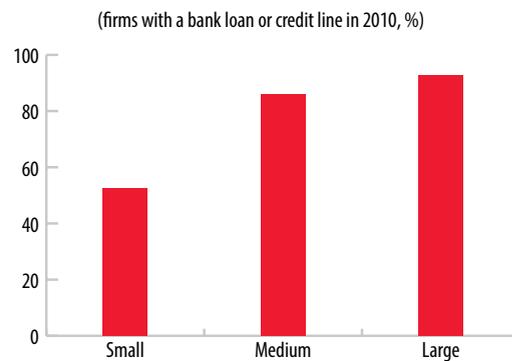
Source: WDI; interest rates are based on IMF IFS.

Figure 63. Access to credit is higher in Lima



Source: Enterprise Surveys, World Bank.

Figure 64. Small firms borrow less from the financial system



Source: Enterprise Surveys, World Bank.

rates, also indicates that smaller and medium firms' costs of borrowing must be high to lift the average to that extent.

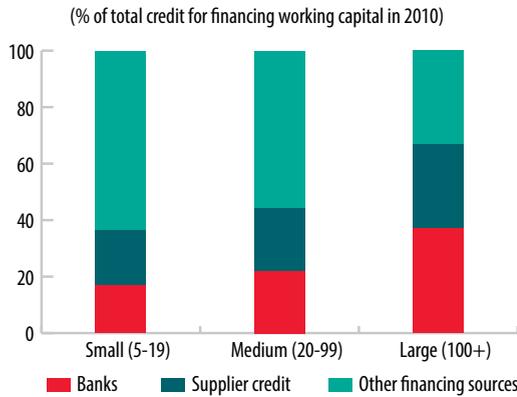
Access to credit also varies geographically. Lima accounts for 44 percent of GDP, but receives 72 percent of the credit. In Lima, 85 percent of firms have a bank loan, compared to 46 percent in Arequipa (Figure 63). This difference is partly related to variations in capital intensity, productivity, and the size of firms. However, differences in access to credit might also have played a role in the productivity gap between Lima and other geographical areas, as discussed in Section 3.

Small firms have both higher costs and less access to credit. Only half of small firms had a bank loan or

credit line in 2010, compared to around 90 percent for medium and large firms (Figure 64). Large corporations and firms obtain finances mainly with banks, but small firms and micro-enterprises face different circumstances (Figure 65). When they have access, there are big differences in the cost of credit faced by firms of different sizes (Figure 66). The annual cost of credit for micro enterprises is 33 percent, when they use the formal financial system. Among SMEs surveyed that obtained credit, almost 20 percent were not satisfied with the terms.

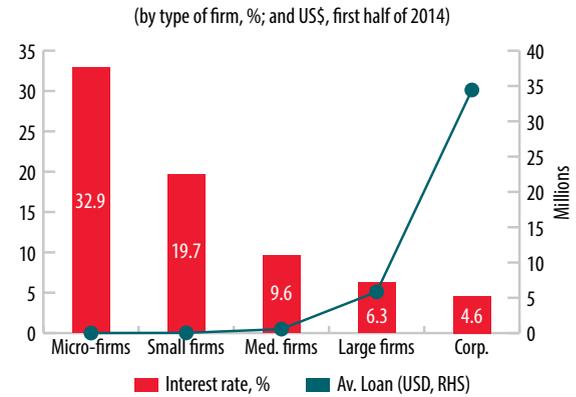
Peru has a low-volume, high-cost financial system. Figure 67 shows a positive correlation between income per capita and the depth of the financial sector, showing Peru in the high-cost and low-volume situation compared to other countries.

Figure 65. Source of credit by type of firm



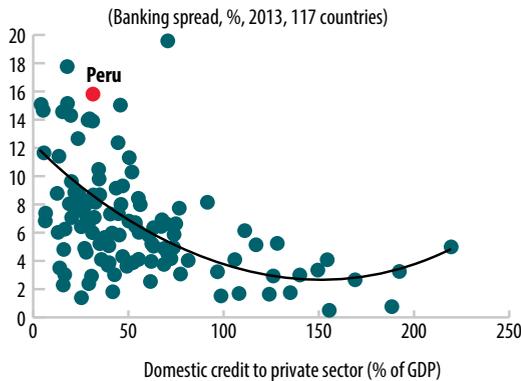
Source: Enterprise Surveys, World Bank.

Figure 66. Cost of credit and average outstanding loans in domestic currency



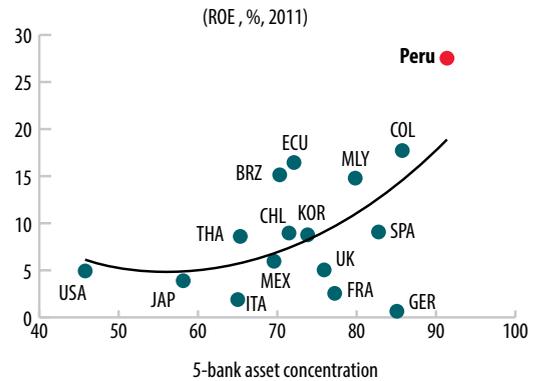
Source: Choy et al. (2015), Central Bank of Peru.

Figure 67. High interest-rate spread, given credit to private sector



Source: WDI.

Figure 68. High banking concentration and profitability



Source: Global Financial Development Data, World Bank.

Note: ROE (return on equity) is calculated as the average for 2007–11. 5-bank asset concentration shows the assets of the five largest banks as a share of total assets in commercial banking.

Figure 68 shows that the interest rate spread is high in absolute and relative terms—the third highest in the sample and the highest for countries with similar credit depth (30–50 percent of GDP). On the demand side, the operating and administrative cost of small-scale loans and the risk of operating with limited information in an environment of informality raise the costs of financing. On the supply side there may be insufficient competition (Figure 68).

Deepening the financial sector and equalizing access would be the key directions of reform

Macro-financial conditions, inertia, and financial industry competition may be some of the supply factors explaining the low financial depth in Peru.

Dollarization remains substantial in spite of low inflation and robust fiscal and external positions, suggesting that the inertia of past financial instability continues to influence the level of development and sophistication of the financial system. Banking concentration and return on equity are high in Peru relative to elsewhere, although competition has

7. Improving access to credit for enterprises

increased in recent years. The number of banks increased from 11 in 2006 to 17 today, and return on equity decreased from 30 percent in the late 2000s to just above 20 percent now. Also, indexes of competitive behavior have increased and financial margins have fallen.⁶⁵ Moreover, micro-finance and other non-bank financial institutions (NBFI) providing banking services have developed well in Peru, a fact not measured by banking concentration. The still-high interest rate spread, however, suggests that there is still room to increase competition. Horizontal policies that promote formality and growth of firms would naturally increase access by enterprises as well as improve competition in the banking system. More efficient financial intermediation will lower the wedge between lending and deposit rates and expand access. These horizontal reforms would eventually help equalize access to credit for small firms and increase productivity in the long term. However, more targeted interventions might be needed in the short to medium term to improve access for small firms.

Given the complexity of the issues involved, further research and analysis of the Peruvian financial sector is needed, and it is beyond the scope of this report. Deeper analysis would help to shed further light on these issues and arrive at more detailed policy recommendations and conclusions.

⁶⁵ Cespedes and Orrego (2014) estimated the Panzar and Rose index for competition in the banking industry and found that it has been increasing since 2008. The Panzar and Rose index is measured as the sum of elasticities of financial to factor prices (expenditure on interest for loanable funds, personnel wages, and capital depreciation expenditure). Moron et al. (2010) estimated the residual elasticity of demand for seven financial products and found that in five of them it increased since 2006. Residual demand is the demand that a bank faces after the rest of the banks have served the market.



Part IV

Other opportunities
to reduce misallocation
and further boost
productivity growth

8. Using spillovers from international trade

What factors can both help reduce misallocation and offer an additional impetus to Peru's already strong productivity growth within firms? As in other countries, Peru's trade has a statistically significant relationship to within-firm productivity growth. Imports of inputs for production are often an instrument to introduce new technology. But export markets also provide strong competition pressures, as shown by progress in reducing misallocation in the Peruvian manufacturing sector. At the same time, innovation is a key driver for productivity globally, but firms do not innovate as much as they should in Peru. Moreover, there are differences in access to innovation inputs between firms of different sizes and ages. Because small and young firms are more productive in Peru—unlike in other countries—this feeds the misallocation of factors. The next two sections analyze the innovation environment and international trade and discuss policy opportunities in these areas to spur productivity.

International trade provides an impetus to increase productivity. International trade introduces competition by integrating countries within larger world markets while offering the benefits of greater specialization and economies of scale. Over the long term, it boosts domestic productivity through learning by exporting and importing. It spurs rapid adoption of cutting-edge technology, modern work processes, best-practice production standards,

and enhanced management capabilities. Most importantly, trade exposes firms to foreign market competition, thus inducing more efficient allocation of resources domestically. This can happen directly in the firms that export and import, or indirectly through the pressure exerted on suppliers via supply chains. All of these features of trading internationally can be viewed as spillovers.

Peru has one of the world's most liberal trade regimes, but trades very little and in a small number of goods

Peru has one of the world's most liberal trade policy regimes. This resulted from deep and comprehensive reforms that began in 1990 as it sharply cut tariffs, eliminated most non-tariff barriers, and liberalized services markets (Figure 69). In 2000 it had an average Most Favored Nation (MFN) tariff⁶⁶ of 12.8 percent, compared with Brazil's 12.7 percent and Malaysia's 4.5 percent. By 2013, Peru had lowered its average tariff to 1.9 percent (against Brazil's 10.1 percent and Malaysia's 3.6 percent). Only around 15 percent of products are subject to nontariff measures (NTMs) versus around 50 percent in Brazil and Chile, and nearly 80 percent in China. Furthermore, Peru was one of the founders of the Pacific Alliance, a Latin American trade bloc with features of further integration.

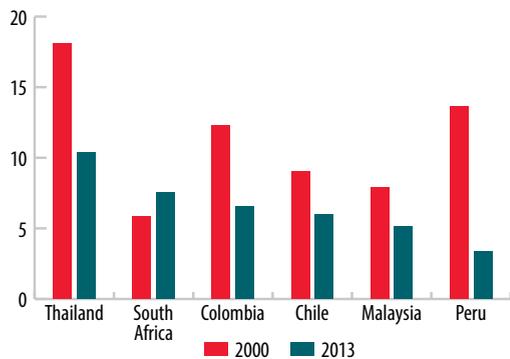
⁶⁶ Weighted average (by trade volume) most-favored-nation tariff.

Yet it trades much less than countries at similar income. Peru leveraged the boom in global commodity markets for rapid growth in the 2000s, but did not take advantage of the productivity-enhancing potential of deeper trade integration. And despite its large minerals trade, its exports are low relative to other countries with similar income levels (Figure 70), at 22.4 percent of GDP in 2014. Peru also has low services trade and is poorly integrated into global value chains (GVCs).

Peru's exports basket is not diversified and dominated by commodities. Export diversification can be measured by the number of products the country exports and the number of markets the country reaches. Between 2000 and 20013, the number of goods and destinations in Peru's exports basket grew

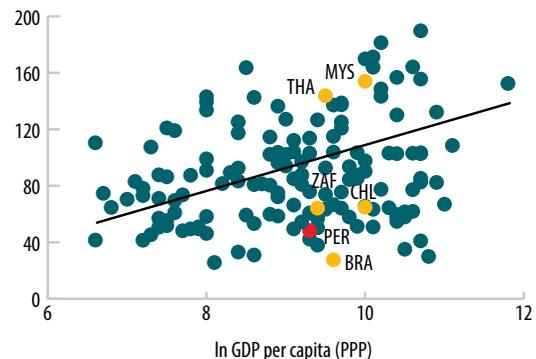
from 747 products and 102 markets to 1,328 products and 118 markets. This apparent success is, however, modest when compared that of other countries in the region (Figure 71). Peruvian exports consist mainly of minerals and metals (copper, gold, zinc, silver) and their products. A far smaller share consists of some vegetables and food products (fishmeal, asparagus, avocados, grapes, and coffee); petroleum and derivatives; and apparel and textiles. Exports of goods grew rapidly in the last decade, by an average of 17 percent annually in nominal US\$ terms, but minerals and metals significantly increased their shares in exports: from 54 percent in 1994 to 72 percent in 2013 (Figure 73). Overall, five sectors (minerals, metals, vegetables, foods, and textiles and apparel) accounted for 91 percent of exports in 2013, virtually unchanged from the 92 percent share in 1994.

Figure 69. Peru has a very liberalized trade regime ...
(simple average tariff rates)



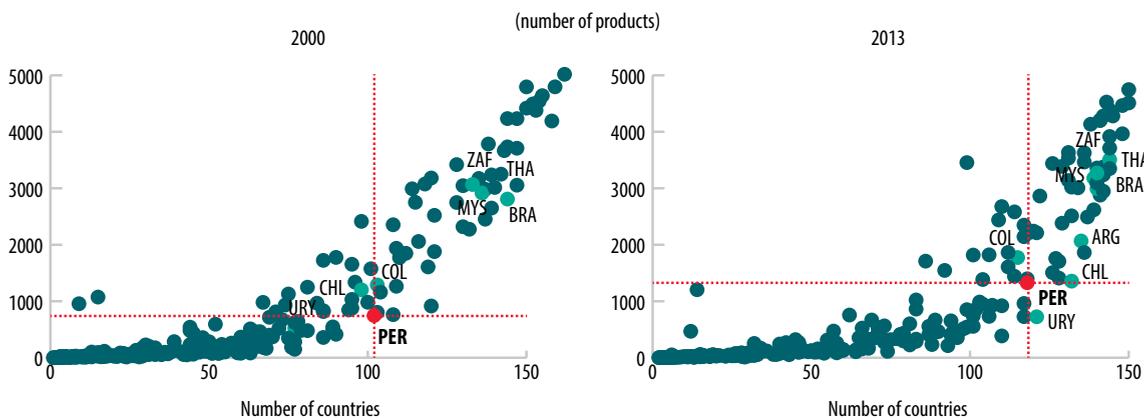
Source: World Integrated Trade Solution (WITS).

Figure 70. ... but trades relatively little
(trade as share of GDP, 2013)



Source: WITS and WDI.

Figure 71. Peru's export diversification success fades in comparison to that of the region

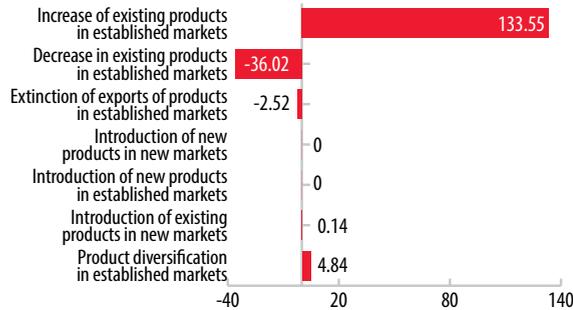


Source: Authors' calculations based on UN Comtrade via WITS; background paper prepared for this report by Farole and Gutierrez (2015).

8. Using spillovers from international trade

Figure 72. Export growth comes mainly from expanding existing markets

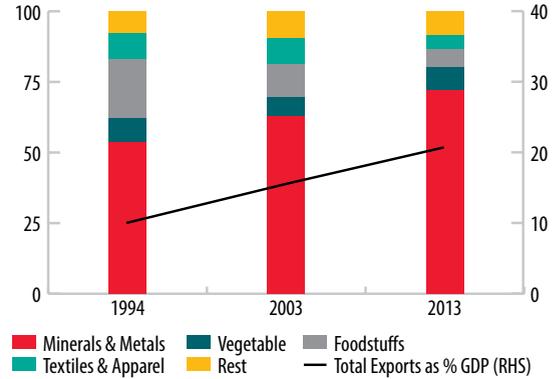
(decomposition of export growth by product and market, 2007–13)



Source: Authors' calculations based on WITS.

Figure 73. Exports are increasingly concentrated

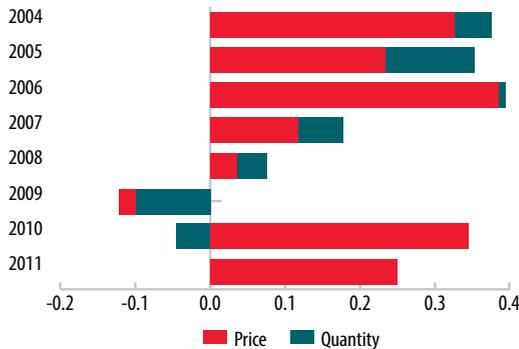
(% of total exports, total export as % of GDP)



Source: WDI.

Figure 74. Traditional export growth was driven mainly by prices

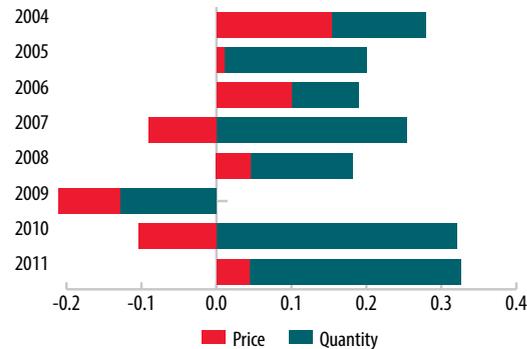
(decomposition of export growth by quantity and price, 2004–11)



Source: INEI, CEPAL.

Figure 75. Nontraditional export growth was driven by quantity

(decomposition of export growth by quantity and price, 2004–11)



Source: Authors' calculations based on Latin America and the Caribbean Region World Bank poverty database (LACPOV) and WDI.

Export of new products to new markets is negligible.

Between 2007 and 2013, almost all of export growth in Peru occurred at the intensive margin (95.1 percent of export growth is explained by existing trade relationships). Furthermore, 133.6 percent of export growth is explained by increases of exports of old products in old markets, which was offset by a reduction of 36 percent in old products in existing markets as well as a reduction of 2.5 percent due to extinction of exports of existing exports in existing markets. The extensive margin overall contributed 4.9 percent to export growth in Peru in 2007–2013. Product diversification in old markets explain 4.8 percent of total export growth, increases of old products in new markets 0.14 percent, and both new products in old markets and new products in new markets zero (Figure 72).

Peru has seen a commendable growth in its nontraditional exports, but has not significantly changed its export profile.

There has been very limited shift into nontraditional or upgraded products. Peru's exports are mostly in raw or semi-processed form rather than products with significant value added. Only around 5 percent of copper and zinc exports are value-added products. Growth of commodity exports has been driven mainly by higher prices than volume (Figure 74). For nontraditional products, more than 90 percent of export growth between 2004 and 2011 was due to quantity expansion (Figure 75). Nontraditional exports grew strongly (albeit from a low base), especially textiles and agriculture. Nontraditional agricultural exports grew by more than 18 percent a year (see Box 4), and some firms became international "export superstars." Growth of textile exports was

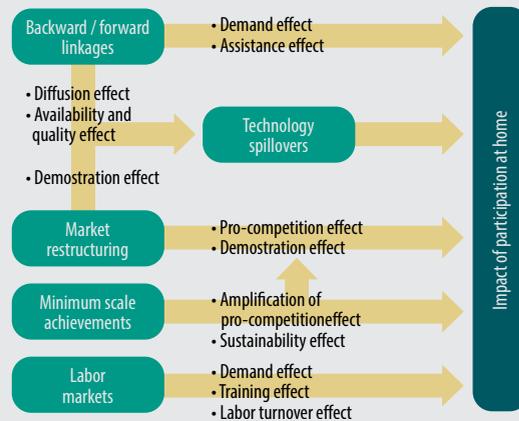
GVCs: an overview

A GVC is a group of firms in multiple countries that operate at sequential stages of a production process. One firm organizes and manages the GVC with the goals of minimizing costs and increasing productivity. GVC-based globalization is driven by firms' global strategies rather than by traditional country-based comparative advantages. Developing countries join GVCs to become competitive, and they industrialize by deepening their participation. (The Box Figure illustrates the channels through which GVCs benefit an economy and raise productivity.) Government policies on trade, investment, employment, and infrastructure need to be formulated to take advantage of emerging opportunities to join GVCs. For Peru, good policies would maximize the value added generated by its exports and increase it over time. The level of that value added is tied to the breadth, variety, and sophistication of tasks and activities that can be located in Peru.

Traditional trade involves goods made almost entirely in one country and sold in another, but the essence of GVC trade is "importing to export." GVC measures domestic value added by subtracting the value of imported inputs from the value of exports. One country (for example, Peru) exports parts that are incorporated in the exports of another country (for example, China). Flows of intermediate goods provide two measures of supply chain integration and a country's role in GVCs. On the sales side, it indicates that exporters are selling into GVCs—forward integration or indirect value added. On the sourcing side, it indicates that a country is buying from a GVC. Patterns on the buying side—backward integration or foreign value added—provide information on the source of technology transfer and the types of GVCs a country is likely to join.

There is untapped potential to expand nontraditional exports and reap productivity gains by integrating into GVCs. This is especially true for integration in the middle of the chains, where value added is higher than from providing natural resource inputs downstream. Falling transport costs, greater global openness, and cooperative trade policies have given rise to GVCs. Each step is carried out where skills and materials are available at competitive cost and quality. New empirical evidence suggests that being in the middle of GVCs plays a role in the way international trade fosters economic growth. GVCs also include trade in services because they add value and are necessary to link activities across countries. By integrating into new GVCs, Peru could diversify its exports and find nontraditional sources of export growth. GVCs link to dynamic, leading global firms to expose local firms to sources of productivity growth through leading-edge technology, business processes, and demanding standards and technical regulations.

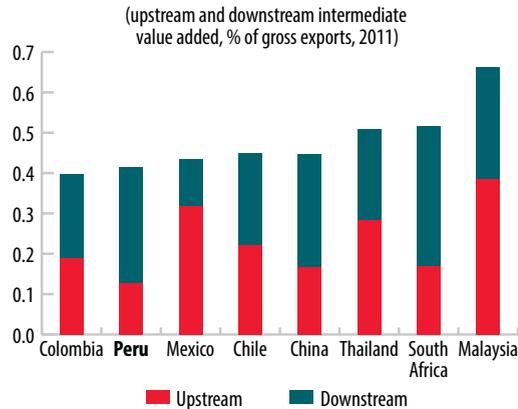
Box Figure. GVCs benefit economies and raise productivity through multiple channels



Source: Taglioni and Winkler (2014).

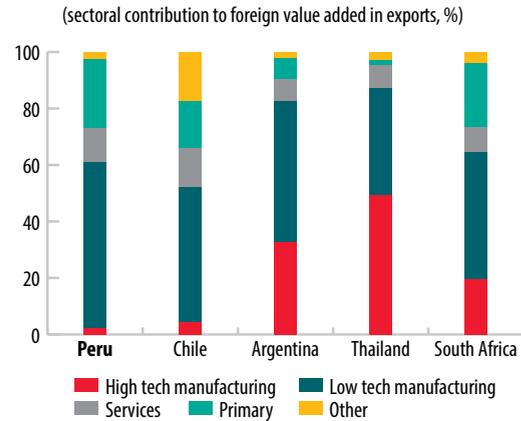
8. Using spillovers from international trade

Figure 76. Peru has limited links to GVCs, as reflected by the low integrated value added and high share of downstream inputs



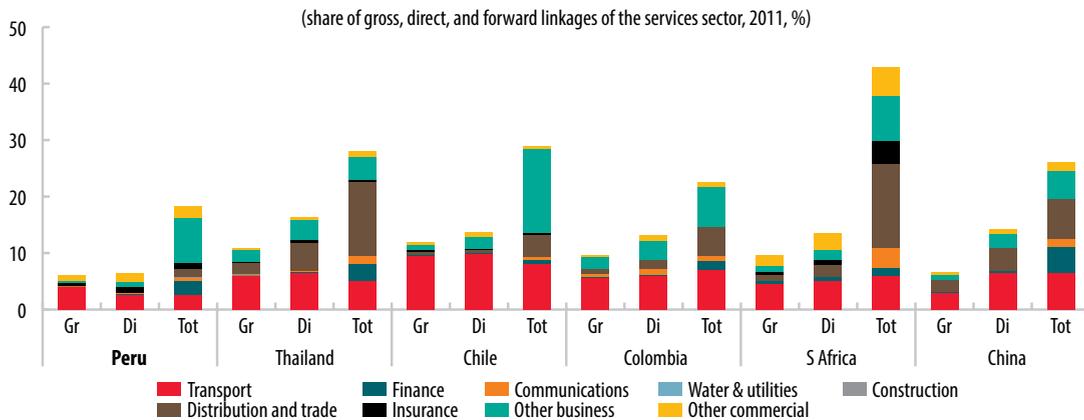
Source: World Bank calculations based on data from Eora dataset.

Figure 77. Peru's exports are mostly low-tech



Source: World Bank calculations based on data from Eora; sectoral technology classifications based on OECD classification of technology content.

Figure 78. Weak forward linkages of services



Source: World Bank Trade in Value Added Database.

Note: Total value added is split up into direct and forward linkages, i.e. the difference between gross value added and direct value added illustrates forward linkages.

primarily to the U.S. market, with significant new firm entry and product experimentation, supported by trade agreements and liberalization. The success of the non-traditional exports is often linked to the participation in the global value chains (GVCs) as described in the following section.

Peru has the opportunity to become a significant exporter of modern services, but it would need to exploit it. Technological advances are making services tradable, such as communications, financial and business services, and call centers. Services now constitute around 20 percent of world trade, but just 5.2 percent of Peru's exports, a low rate given the country's human capital endowment and

performance in information and communications technology. Services exports are still concentrated in traditional services such as transport and travel.

Peru's low participation in GVCs reflects its behind-the-border structure, especially low intermediate inputs from the services sector

Peru's participation in GVC is limited, but there are opportunities to develop it. (Box 5 presents an overview of GVCs.) Peru's role in GVCs is mainly to supply primary inputs via downstream linkages (see just below), although notable successes have also taken place in the non-tradable sectors (Box 6). Peru

Box 6

Successes and opportunities of GVCs for upgrading and productivity spillovers

There have been some notable success stories in trade integration. In agribusiness, Peru has earned a strong position in global retail chains: mainly fruits and vegetables and more recently quinoa. Horticultural exports expanded from asparagus to paprika, avocado and citrus, then grapes and, most recently, blueberries (Box Figure). In apparel —Peru’s largest manufacturing export sector— the number of exporters in knitted apparel (HS 61) increased from around 200 during 1997–2001 to over 350 during 2002–2006; the number of products exported jumped from 50 during 1997–2001 to almost 70 during 2002–2006. However, “export superstars” did not emerge on the same scale as in agriculture, and the sector has struggled since the crisis peak. Plastics comprises a promising complex of manufacturing sectors, which is among Peru’s fastest-growing exports. Interestingly, virtually all of Peru’s “export superstars” in these sectors make significant use of imports, reinforcing the importance of external spillovers in productivity growth.

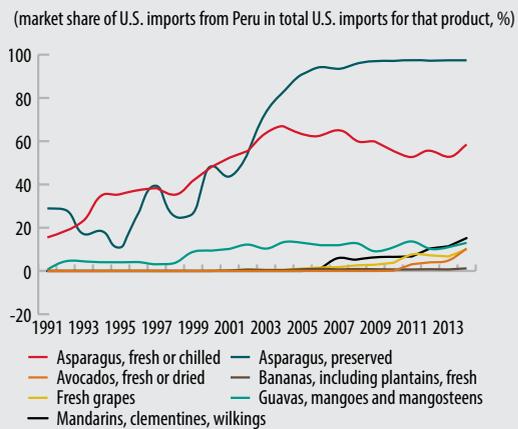
Peru’s successes in nontraditional exports point to future opportunities. High-quality cotton apparel, for example, has had high value capture within Peru, from agriculture to finished apparel exports, and it upgraded the unit value of products by 50 percent between 1998 and 2014. It has diversified its export markets within the region and generated demand for cotton inputs from small producers. The sector has opportunities to upgrade further as a fast-fashion supplier in high value brands or by design and branding activities.

Table grapes are an exemplary sector that has had the most success recently. Their success builds on earlier agricultural exports such as avocados and asparagus, diversifying horticulture, deepening its marketing

capabilities, and opening global markets. It exports grapes to over 70 countries, including sophisticated markets in Europe, and has generated positive spillovers for smaller producers to export and for the future export of other crops. There was extensive knowledge transfer to Peru, especially from Chile. Developing backward linkages to input providers and forward linkages into grape juice or raisins would strengthen the sector further.

In mining equipment, the success of early firms was largely the result of technology transfers from foreign firms. New products have been developed, and Peruvian firms have built capabilities in design and development by working with foreign firms in the domestic market and in Chile. There has been upgrading with a greater focus on quality and safety standards. Opportunities exist to strengthen connections between firms and other stakeholders to generate synergies or spillovers for the overall economy. So far, most spillovers have come from labor rotation.

Box Figure. Some notable export successes were helped by entry into GVCs

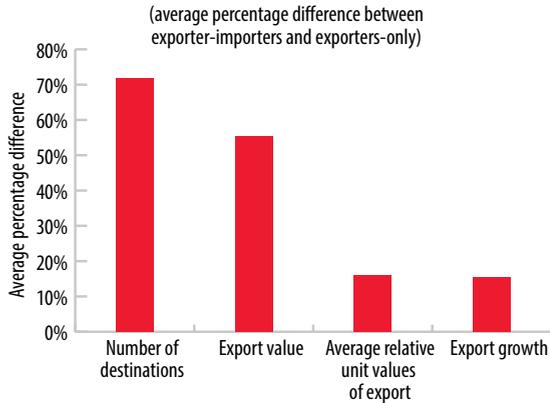


Source: Authors’ calculations on Superintendencia Nacional de Administración Tributaria (SUNAT) data.

Source: Authors and Background papers prepared for this report by Pierola et al. (2015), Fernandez-Stark et al. (2015a), Fernandez-Stark et al. (2015b), Fernandez-Stark, et al. (2015c).

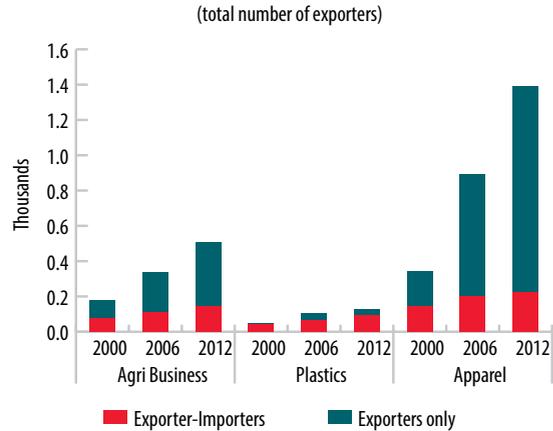
8. Using spillovers from international trade

Figure 79. Returns on importing are significant...



Source: Authors' calculations based on customs data; background paper prepared for this report by Pierola et al. (2015).

Figure 80. ...yet most exporters do not import



Source: Authors' calculations based on customs data; background paper prepared for this report by Pierola et al. (2015).

participates little in sectors typically associated with dynamic GVCs like motor vehicles, electronics, and services offshoring. Critically, Peru has extremely limited upstream linkages in GVCs, that is, it makes very little use of imported inputs (and their embedded technology) in its exports (Figure 76). And just 2 percent of Peru's GVC imports are embedded with high technology—far lower than, for example, Thailand's (50 percent) and Argentina's (30 percent, Figure 77).

- **Downstream linkages.** Peru's share is one of the highest among comparator countries. Most Peruvian exports are commodities (metals/minerals) that are easily incorporated into other countries' exports, and almost a third of domestic value added that is exported ends up in other countries' exports.
- **Upstream linkages.** The share of foreign value added in Peruvian exports is low versus similar countries and is only one-third of the countries like Mexico or Malaysia that are highly integrated into GVCs. This is because most Peruvian exports are natural resource-based and most of the value added is from extracting and processing minerals and other natural resources with scant foreign inputs.

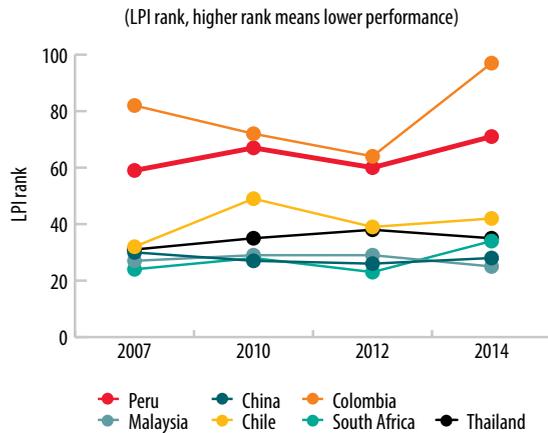
Peru's past and recent success in boosting non-traditional exports points to future opportunities to join global value chains. In agribusiness, Peru has earned a strong position in global retail chains. In apparel—Peru's largest manufacturing export sector—the number of exporters and products increased dramatically over the last 15 years. Plastics is a promising complex-manufacturing sector, which is

among Peru's fastest-growing exports. Interestingly, virtually all of Peru's "export superstars" in these sectors make significant use of imports, reinforcing the importance of external spillovers in productivity growth. These are discussed in more detail in Box 6.

The services sector is lowering competitiveness through weak forward linkages to exporters. The quality, cost, and reliability of services are important for competitiveness. Services are critical in GVCs and can be value-added, exportable elements embedded within the chains. They can also be major indirect exports, accounting for a share of the value added in goods-producing sectors. In Peru, however, the forward linkages of services exports are low. Services' value added in total exports is 19.6 percent, and only 8.4 percent of manufactured goods exports (see also Section 4). In most comparator countries, the ratio of services in value added of exports reaches 30–40 percent and about 20 percent of manufactured exports (Figure 78). On value added, business services and finance are the services most linked to goods exports; traditional services, like distribution, trade, and transport, have limited forward linkages.

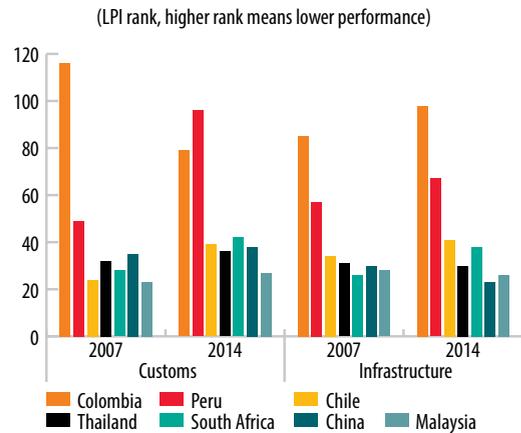
Peru's use of imported inputs is low, even though the firms that use them have measurably better outcomes. Notwithstanding some notable successes in integration (see Box 6), low imports are a reflection of low participation in GVCs and thus an indicator of poor use of spillovers. Importing to export affects multiple dimensions of firms' performance. Exporters that import mainly from high-income countries (this

Figure 81. Peru ranks low on logistics performance...



Source: Logistics Performance Index (LPI, World Bank).

Figure 82. ...especially customs and infrastructure



Source: LPI (World Bank).

can be indicative of high-technology imports) show stronger productivity, export value, diversification, and export quality. And any exporter that also imports enjoys better export performance—more diverse destinations and higher export value, export quality, and growth (Figure 79). Despite the benefits from importing, in 2012, 60 percent of Peru’s agricultural exporters and 80 percent of apparel exporters did not import (Figure 80).⁶⁷ While all “exports superstars” were also strong importers, this may suggest that small firms face heavy barriers to importing.

Infrastructure for trade, including logistics—and other behind-the-border issues—remain a constraint

Improving infrastructure for trade and logistics, and dealing with other behind-the-border issues present a significant opportunity to boost trade. Peru’s logistics costs—about 32 percent of product value—are among the highest in Latin America, well above Colombia’s (23 percent) and Chile’s (18 percent),

67 The data used for this analysis allow the identification of inputs and other goods imported directly by exporters. There may be other inputs and goods imported indirectly through third parties (e.g., distributors and traders); however, these transactions cannot be identified with the data available for the analysis. Importing indirectly may be an efficient strategy for small firms and for the import of non-core inputs, as it can reduce the fixed costs of establishing relationships with international buyers and may confer some scale-related cost benefits. However, for the purpose of analyzing the degree of integration of exporters into GVCs, transactions covering direct imports are the most critical—firms that are integrated into GVCs would normally source directly, as these sourcing relationships are critical from a quality and technology spillover perspective. See the background paper prepared for this report by Pierola et al. (2015).

as well as Brazil’s (26 percent) and Argentina’s (27 percent). The OECD average is only 9 percent of product value. Peru ranked 71st in the world in 2014, having fallen from 59th in 2007.⁶⁸ This is substantially worse than comparator countries such as Malaysia (25th), Thailand (35th), and Chile (42nd; Figure 81). Customs and infrastructure are areas where Peru’s trade facilitation and logistics ranking has declined markedly, the former from 49th to 96th and the latter from 57th to 67th (Figure 82). Bureaucratic and infrastructure obstacles weigh on some of Peru’s more dynamic exporters (Box 7).

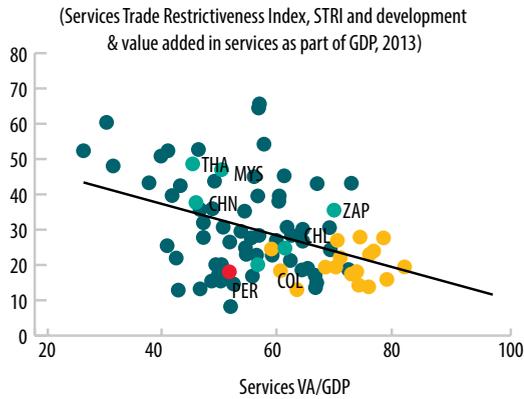
The narrow contribution of services to exports may reflect shortcomings in domestic competition and regulatory regimes. As discussed in Section 4, domestic constraints affecting firms in the services sector misallocate factors of production and introduce significant distortions in the intermediate goods markets, which are hurting exporters in all sectors of the economy. Peru’s services value added and services exports are low despite its relatively low services trade barriers (Figure 83). This suggests that other supply-side constraints such as skills availability and electronic and physical infrastructure play a bigger role in services trade performance.

The government has opened services to foreign competition, but there are impediments in the

68 The World Bank’s Logistics Performance Index (LPI) rates the transport and logistics environment in 160 countries. LPI rates countries on six factors: customs clearance, infrastructure, international shipping, logistics services, tracking and tracing, and timeliness and reliability.

8. Using spillovers from international trade

Figure 83. Services trade costs are high

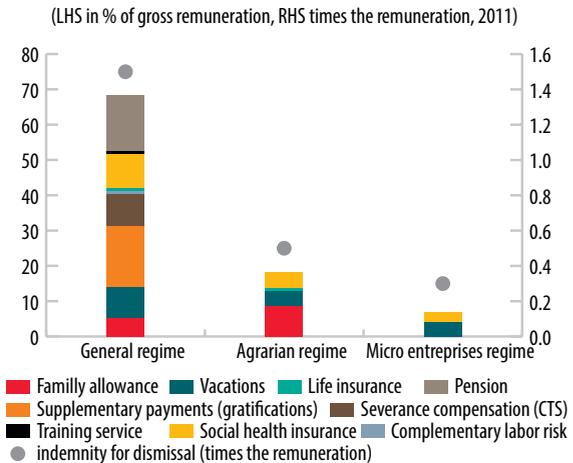


Source: World Bank STRI; WDI.

domestic regulatory regime, which limits entry and competition (Section 5). Regulatory structures and institutions lag behind those in comparable countries affecting services trade performance.⁶⁹ Firm-level analysis concludes that domestic reforms aiming at increasing foreign firm participation and enhancing in services markets have an economy-wide downstream effect for Peruvian firms. The analysis shows that both foreign services firm participation and increased competition (measured through concentration indicators) in Peru's services markets increase downstream productivity. In other words, downstream industries that are more reliant on services as part of their input use benefit more from foreign firm participation and enhanced competition in upstream services. Finally, the analysis shows that both foreign presence and increased competition in services also have a significant and positive effect on downstream productivity growth in Peru; also, next to the level of productivity, the services reforms in Peru also have a significant effect on the growth of productivity. To increase the services trade role in the Peruvian economy, reducing access barriers, improving market competition, identifying skills shortage relevant for services activities, and improving both electronic and physical infrastructure would be crucial.

⁶⁹ Reforms that were carried out in the 1990s (see Box 1) included the deregulation of some key service markets, such as the financial, electricity, and telecommunications sectors, exposing them to increased foreign competition. Moreover, in the 2000s, Peru signed several trade agreements with its major trading partners, deepening the conditions of competition in service sectors. However, important restrictions to competition in services markets, such as professional services, still prevail, as described in Section 5 of this report.

Figure 84. Nonwage labor costs are high



Source: Staff calculations based on ENAHO, MEF, and Central Bank data.

High non-wage labor costs reduce the competitiveness of Peru's exports. During the 2000s, labor earnings grew faster than productivity, particularly in manufacturing, driven by nonwage costs which, under the General Labor Regime, account for 68.2 percent of the basic wage, by far the highest in the region. Nonwage labor costs in Chile and Mexico are below 30 percent and in Brazil around 56 percent. In practice, special regimes—including one specifically for nontraditional exporters—and a high degree of informality mean that few firms actually pay all the nonwage costs (Figure 84). But reliance on special regimes raises information and administration costs, which tend to hit smaller exporters hardest.

Sector-specific constraints restrict nontraditional export sectors. In agriculture, for example, increasing constraints on access to water are a barrier to growth. In the textile value chain, limited access to land prevents efficiently sized cotton suppliers from emerging, undermining the competitiveness of the high value-added Pima cotton value chain. Major skill gaps are emerging in most sectors, contributing to weak productivity growth and lower export competitiveness. These checks tend to hit smaller exporters harder.

Several policies could improve Peru's trade performance, raising productivity and international competitiveness. Peru's experience has shown that trade liberalization is a necessary—but not sufficient—condition for increasing competitiveness; it is now turn for domestic

Bureaucratic and infrastructure obstacles lower export competitiveness

While the three successful nontraditional export sectors have largely overcome constraints, they still face obstacles, which other less successful firms also grapple with.

In high-quality cotton apparel, Peru's irrigation infrastructure offers favorable conditions for cotton production. However, it has been uncompetitive in attracting foreign direct investment (FDI) to the sector because of relatively high labor costs, absence of tax incentives, economic processing zones, and bureaucratic and infrastructure constraints. Inadequate port and highway infrastructure increased costs of trade, eroding the "fast fashion" advantages of proximity to key markets and the ability to produce clothing rapidly. Transportation costs can be up to twice that of shipping from Chile.

In table grapes, the coastal growing region benefits from abundant irrigation infrastructure, and with planned public-

private investments, more than 200,000 new hectares are expected to be added to agriculture by 2020. But the two fruit-exporting ports are not fully prepared to receive the export volume, especially during the high season, when delays are common. The road infrastructure has improved recently but road quality is still not good and delays imperil the quality of produce. The sector is burdened by costly delays and bureaucratic procedures related to government services necessary to open facilities, clear customs, or handle phytosanitary issues.

In mining equipment, Peru is at the geographic center of Latin America's mining region. This is a competitive advantage for shipping large, heavy items, but infrastructure weaknesses erode it. Road, rail, and port infrastructure undermine the industry, despite investments to expand the Port of Callao, and regulatory challenges delay land zoning and the establishment of industrial operations.

Source: Background papers prepared for this report by Fernandez-Stark et al. (2015a), Fernandez-Stark et al. (2015b), and Fernandez-Stark et al. (2015c).

reforms. These include improving the behind-the-border environment, including streamlining customs clearance regimes; increasing the capacity and quality of transport infrastructure, logistics, and storage and distribution services; improving incentives for consolidating freight services; consolidated reforms aimed at adoption and consolidation of the sanitary and phyto-sanitary standards is also needed. A more robust innovation environment would also facilitate diffusion of GVC-acquired knowledge and improve downstream links for exporters. Addressing domestic regulations in services would facilitate their role of supplier of intermediate inputs for exports of manufacturing and more complex services. Finally, improving labor market flexibility and reducing nonwage costs would also contribute to higher trade volumes, as would building human capital and more complex skills that can be used in higher value-added manufacturing and services (these are analyzed in Section 6).

9. Unleashing innovation

Innovation is a driver of within-firm productivity, but if innovation inputs are not equally accessible it can also feed misallocation of factors.

Innovation in developing countries relates more to the adoption and diffusion of existing knowledge and technologies than to the creation of new-frontier technologies (Box 8). But any kind of innovation is at the heart of raising productivity. However, if not all firms have equal access to innovation inputs, it might also feed factor misallocation. For example, in Peru small and young firms are more productive (see Section 3), and if they have less access to inputs for innovation such as finance, this shortcoming in the innovation system would contribute to reducing overall productivity, while still increasing within-firm productivity for large firms. This section looks into the specific features of the Peruvian innovation system and considers options for improvements that would be most effective in raising overall productivity.

Peruvian firms innovate little

Peru lags behind other comparable countries on adopting existing technologies. According to Peru's latest Enterprise Survey, 14.2 percent of firms have an internationally recognized quality certification, slightly lower than the LAC average of 16.2 percent but far lower than the OECD average of 32.8 percent. Only 7.7 percent of firms in Peru adopt technology licensed from foreign companies while the LAC and OECD averages are 14.2 percent and 18.2 percent,

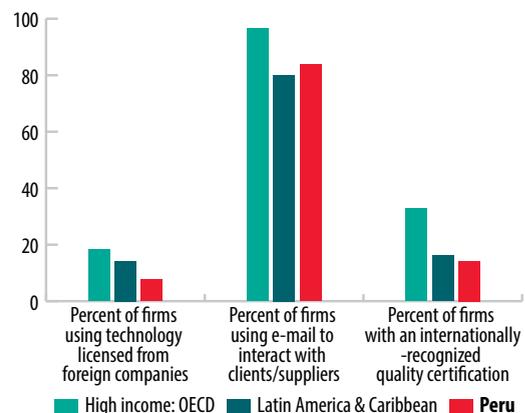
respectively (Figure 85). Research and Development (R&D) is low and mostly public: 29 percent of firms invested in it in 2004 (the latest year with data), while in Chile and Colombia 40 percent did that year, but today 45 percent do so.

Low rates of innovation may be reflected in Peru's industrial composition and its undiversified exports.

A more diversified export basket with diverse levels of value added can make an economy more competitive and resilient in the face of external shocks. Peru's manufacturing exports, however, are concentrated in low-technology industries and primary products.

Figure 85. Peru lags behind the region in technology adoption

(% of firms, latest year available)



Source: Enterprise Surveys, World Bank.

What is meant by innovation?

Innovation refers to activities (creation of new products and improvement of existing knowledge and production processes) that either expand the technological frontier or absorb and adapt existing technology. Innovating at the frontier requires high-quality education, continuous investments in research and development, and well-defined and enforceable property rights. These create incentives for innovation as well as provide the required inputs for “innovators” (entrepreneurs).

But most innovative activities are not at the frontier. This category is based on absorbing knowledge—typically from abroad—through international transfers and spillovers. Even simple applications of existing knowledge can be innovative from the perspective of a company (that adopts a new product line,

for example) or a grassroots entrepreneur (who starts using a phone for financial transactions). The most productive and inclusive kind of innovation seems to be in the middle when firms can be “piggybacking” through technological change: leapfrogging to wide use of new technologies by piggybacking on the existing knowledge and patent base. Importantly, this kind of innovation requires sufficient absorptive capacities in the economy, which are akin to those required for frontier innovation, although less sophisticated.

In this report we use the term “innovation” to identify activities that are new to the firm or a country (and thus can be based on existing technologies adapted to local context), and “frontier innovation” to refer to the creation of completely new knowledge.

Sources: Freeman (1987), Lundvall (1992), Nelson and Rosenberg (1993), Metcalfe (1995).

Only 0.4 percent of exports are considered high tech, against 2.2 percent in Argentina, 3.3 percent in Brazil, 0.9 percent in Colombia, and 6.0 percent in Chile.

Low investment in innovation might be related to low returns to innovating

Firms invest too little in innovation, indicating that the innovation system might not be functioning properly. In Mexico, Colombia, and Peru within-firm productivity growth has been the main driver of productivity convergence with the international and domestic frontiers. In Mexico and Colombia, innovation has been the main driver of firm-level productivity convergence, but this is not the case in Peru.⁷⁰ Peruvian firms invest on average 2.5 percent of their sales in innovation whereas peers in Chile invest 3.5 percent. Firms from advanced economies invest even more: up to 5.6 percent of sales in the European Union (Figure 86).

Firms that do invest in innovation in Peru are more likely to introduce new products, but low returns (in sales) to innovation may be contributing to the low level of investment observed. Innovation investment correlates strongly with firms’ sales, but firms’ returns are lower in Peru than in other countries. If a Peruvian firm spends on innovation-related activities, it is more likely to introduce a new product or new process than firms in other LAC countries except Chile (Figure 87).⁷¹ Firms that introduce new products or processes have an average of 38 percent higher sales per employee. While a substantial return, this is significantly lower than in five other countries (where the increase is on average 100 percent, Figure 88). A 1 percent increase in innovation expenditures leads to a 0.22 percent increase in sales per worker in Peru while in other LAC countries—Costa Rica aside—the elasticity ranges from 0.2 in Chile to 0.69 in Panama.

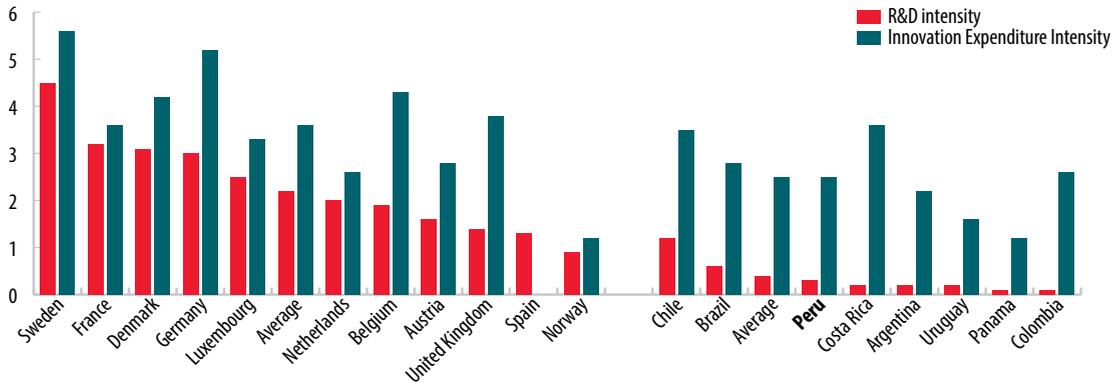
⁷¹ Innovation expenditures include technology transfer, computing hardware and software purchases, design and industrial engineering, marketing activities for innovation, other internal R&D, and other external R&D. Source: Encuesta Nacional de Innovación 2013 by INEI.

⁷⁰ Brown et al. (2015) and Iacovone and Tran (2015).

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Figure 86. Manufacturing firms in Peru invest little in innovation

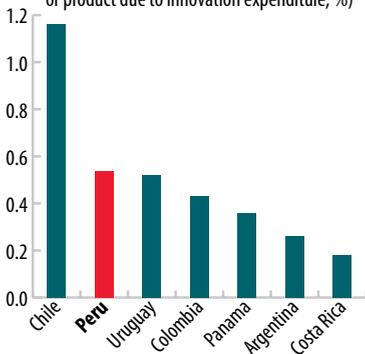
(% of firms' sales, countries grouped roughly by their income per capita level)



Source: Innovation Surveys based on data from OECD (2009), IDB (2011), and National Innovation Survey.
Note: Data refer to manufacturing industries only.

Figure 87. Innovation investment seems to work...

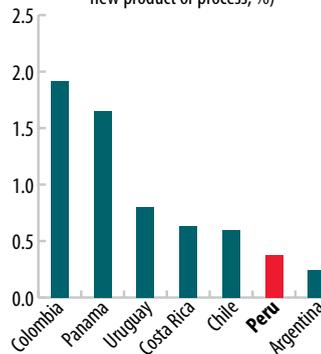
(marginal increase in probability to have new process or product due to innovation expenditure, %)



Source: Authors' calculations based on Encuesta Nacional de Innovación 2012: Background paper prepared for this report by Nguyen et al. (2015).
Note: Coefficients reported are marginal effects, i.e. they predict the likelihood of introducing product or process innovation. Controls include size of the firm, whether it exports, and whether it is foreign owned.

Figure 88. ...but returns to innovation and to investments in innovation are low in Peru

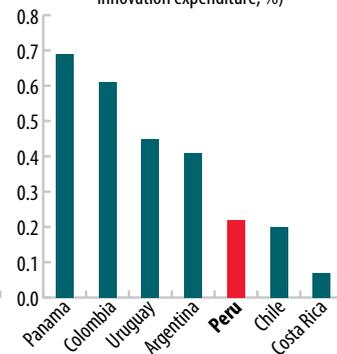
(sales per worker increase due to new product or process, %)



Source: Authors' calculations based on Encuesta Nacional de Innovación 2012: Background paper prepared for this report by Nguyen et al. (2015).

Note: Percentage increase in sales from a 1% spending increase on innovation, or from an introduction of new product of process. Controls include firm size, age, nontechnological innovation, sector, and region dummies.

(sales per worker increase due to innovation expenditure, %)



Young and small firms—which are the most productive in Peru—appear to be especially constrained in their innovation efforts. When innovation happens, it is more likely among larger firms. During 2009–11, about 30 percent of firms had some technological innovation. The average age of the firms that innovate is 22 years, 5 years older than the average age of firms that do not. The average number of employees of innovating firms is 75 percent higher than in other firms—350 versus 200. Small and young firms therefore seem to be facing specific constraints to innovating. Indeed, while old firms mostly complain about quality of personnel, young firms also perceive

financing and market domination by other firms as major constraints (see Figure 89).

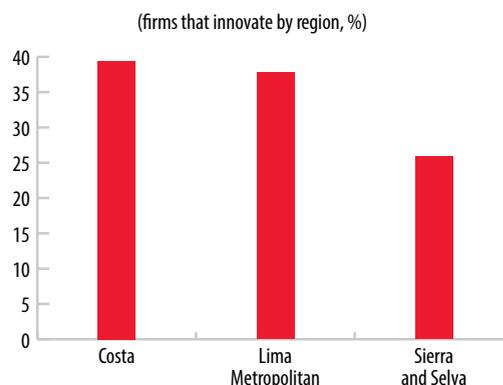
Outside-of-firm constraints, especially in product and intermediate goods and services markets could be causing low returns and reinforce biased access to inputs. The fact that investment in innovation gives high returns to innovation outcomes, which then give low returns on sales, points to possible product market competition and regulation issues. As pointed out by more than 25 percent of firms surveyed in the Encuesta Nacional de Innovación (National Innovation Survey 2012), market dominance by established

Figure 89. Firms' constraints to innovation differ by age



Source: Encuesta Nacional de Innovación 2012.
 Note: only constraints declared very important by 25% or more firms are reported.

Figure 90. More firms innovate in the coastal area



Source: Authors' calculations: background paper by Nguyen et al. (2015), based on National Innovation Survey 2012 (NIS).
 Note: Costa excludes Lima Metropolitana.

firms is one of the top five constraints to innovation (Figure 89). The fact that firms are facing unequal access to innovation inputs could also reinforce factor misallocation issues—especially when the most productive young and small firms are the ones that suffer. Similarly, it is possible that sales returns are low not only because of product market issues, but because of the intermediate goods and services markets: if transportation services or financial services for expansion are not available, expensive, or have uneven access points, not all firms can receive equal access to inputs necessary to expand production after having innovated.

The underdeveloped innovation system constrains invention, adoption, and diffusion

Low innovation effort reflects Peru's innovation system shortcomings. The national innovation system (Box 9) is still at an embryonic stage. The elements are there but the capacity of actors to fully undertake activities formally remains limited: the system is uncoordinated and does not seem to have a common strategic vision, such that it lags behind the systems in other emerging economies.⁷² These deficiencies are reflected in inputs and investment in innovation and knowledge (human capital and education, science and technology, technology adoption, software investment, and other intangibles), and in knowledge and innovation outputs. Property rights—another

important part of the innovation system—have also been shown to be important in firms' decisions to invest in innovation. In LAC in general, improvements in property rights are shown to have strong impacts on firms' decision to innovate, unlike in other regions.⁷³

The adoption and creation of knowledge are restricted by having too few scientific researchers or university graduates in science and technology. Peru ranks 113 out of 144 countries (Figure 91) in terms of availability of scientists and engineers, and is the lowest among peer countries. Industries point to shortages of engineers and technicians as an important constraint on their performance, innovation, and growth. Several industries highlight the need for experienced engineers whom they cannot find in Peru. (The number of engineering graduates is growing, however, and around 25 percent of university students are taking science and engineering programs.)

The diffusion of new knowledge is limited, indicating transmission problems in the innovation system. The linkage between industry and science for

73 Nguyen and Jaramillo (2014). Regarding the intellectual property rights, given the low levels of frontier innovation and firms' knowledge about intellectual property rights (IPR), they are unlikely to be the main cause of Peru's problems at this point in the development process. Peru does have a less developed IPR environment however, compared to Colombia, Mexico, and Chile. The 2015 Global Intellectual Property Center (GIPC) Index is a composite indicator that measures the national IPR environment based on the state of legal frameworks and their enforcement. The Index maps the IPR environment of 30 economies, accounting for nearly 80 percent of global GDP. Economies' GIPC Index scores are evaluated on the basis of 30 indicators indicative of a robust IPR system.

72 Several innovation reviews have been conducted including by OECD (2009) and UNCTAD (2011).

Peru's national innovation system

Building a policy framework for innovation requires coherent actions in several policy areas: education, trade, investment, finance, and decentralization. Innovation can be likened to gardening: prepare fertile ground (education), nurture the soil (R&D, information transmission, and connectivity), remove weeds (competition and regulation policy), and irrigate and fertilize (finance, and other support for innovators).

The national innovation system comprises the firms, research institutes, universities, financial institutions, and R&D industry that jointly contribute to innovation. The system's success depends on linkages among these agents, and on the environment and incentives for collaboration: the education system develops absorption capacity for learning, technologies, and ideas; finance is necessary to commercialize ideas and develop new projects; the links between academia, R&D, and firms allow for creation; absorption and diffusion of knowledge among all the

participants of the innovation process, as well as agglomeration effects in cities, facilitate knowledge spillovers.

Peru has innovation and competitiveness funds and public and private instruments for technology transfer, such as the National Fund for Science, Technology and Innovation Fondo para la Innovación Ciencia y Tecnología (FINCYT), the R&D Fund for Competitiveness Fondo de Investigación y Desarrollo para la Competitividad (FIDEICOM), and the Framework Fund for Innovation, Science and Technology Fondo Marco para la Innovación, Ciencia y Tecnología (FOMITEC). The government has introduced fiscal incentives (tax deductions) for R&D investment and acquisition of equipment.

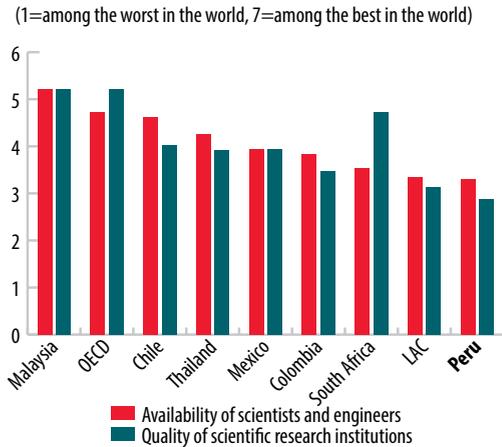
Peru lags behind other Latin American countries in offering broader support for science and technology. The Box Table shows the range of science and technology programs for LAC countries.

Box Table: Peru implements fewer supply-side instruments than other LAC countries

Instrument/ Country	URY	ARG	MEX	PAN	CHL	BRA	COL	CRI	PER	PRY	DOM	GTM	SLV
Science and technology funds	x	x	x	x	x	x	x	x	x	x	x	x	
Support to centers of excellence	x	x	x		x	x	x		x				
Scholarships: undergrad., grad., or postgrad.	x	x	x	x	x	x	x	x	x				
Support for national postgrads.	x	x	x	x	x	x	x	x		x			
Salary incentives to research	x	x	x	x									
Affiliation with national researchers abroad	x	x	x	x	x								

Sources: Background paper prepared for this report by Zuniga (2015), World Bank (2010) Innovation Policy, Freeman (1987), Lundvall (1992), Nelson and Rosenberg (1993), Metcalfe (1995); Table updated from Políticas e Instrumentos en Ciencia, Tecnología e Innovación en América Latina y el Caribe 2009; Inter-American Development Bank (IDB), Red de Ecología Social (REDES), and Red de Indicadores de Ciencia y Tecnología (RICYT).

Figure 91. Peru's low innovation base



Source: WEF Executive Opinion Survey, 2013–14 weighted average.

Figure 92. Poor university-industry collaboration in R&D slows diffusion



Source: WEF Executive Opinion Survey, 2013–14 weighted average.

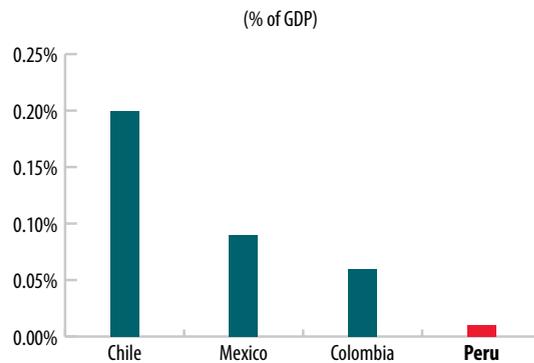
knowledge sharing in Peru is the weakest among peer countries (Figure 92). In Peru, most of firms innovate in isolated fashion. Firms' production of innovation of any kind—product, process, or marketing- or organization-based—are carried out with their own funds and without any collaboration with other entities. University and industry collaboration in R&D is the weakest in Peru among peer countries (Peru ranks 109 out of 144 countries in the corresponding WEF indicator). This suggests the need for exploiting spillovers, increasing interactions with research institutions and public programs to increase efficiency in innovation, raising incentives to innovate, and lowering innovation costs for firms.⁷⁴ Diffusion of technologies from the frontier firms to other firms in the same industry is low in Peru, while such spillovers have been important factors of productivity convergence in Mexico and Colombia.⁷⁵ Vertical spillovers from firms to suppliers — that improve quality of inputs for other firms in the same industry — have been shown to be most effective

(see also Section 8). Firms in the coastal area, where density is higher, are more likely to innovate (Figure 90)—an encouraging sign.

Public policy can help improve innovation outcomes

Public investment in innovation is low but also lacks effectiveness. Peru's public expenditures on science, technology, and innovation as a share of GDP are low compared with other LAC countries. The Consejo Nacional de Ciencia, Tecnología e Innovación Tecnológica (CONCYTEC) is a principal public-funding agency for science and technology, yet its 2013 budget was a mere 0.009 percent of GDP—innovation

Figure 93. Low public investment in innovation



Source: Informe de Rendición de Cuentas de la Administración Pública 2011 (Mexico); CONICYT Institucional Brochure 2013 (Chile); Informe de Gestión 2012 (Colombia); Plan Operativo 2012 (Peru).

74 Tello (2013).

75 Brown et al. (2015) and the background paper by Iacovone and Tran (2015) regress firm-level labor productivity growth (change in value added per employee) on a range of variables including "spillover" terms that are the change in the local and global frontiers of labor productivity. Including these terms controls for technological shifts, domestically and globally. If there are spillovers from the best firms to other firms (such as through learning) so that productivity in the average firm improves with productivity of the frontier firms, these terms will be positive. Contrary to results for Mexico and Colombia, they find the terms are not significant, so there is no evidence that firms, even those in Lima and Callao, were able to grow faster when there were positive technological shifts at the frontier. This could be related to data quality and Peru sample size and should be interpreted with care, however.

National Survey of Innovation in Manufacturing Industry 2012.

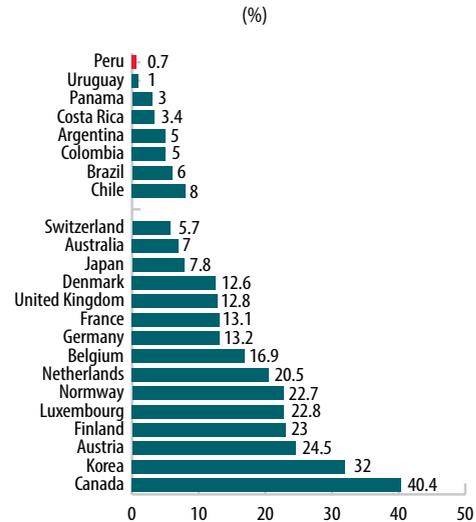
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agencies in regional countries had budgets that were 6 to 20 times higher (Figure 93). But public support also reaches very few firms—less than 1 percent (Figure 94)—among the smallest coverage in LAC countries for which data are available. In Brazil and Chile, innovation policy instruments are being used by 6 and 8 percent of firms, respectively. Thus, the amount of public spending alone is not an indicator of success or policy direction, if effectiveness is not improved.

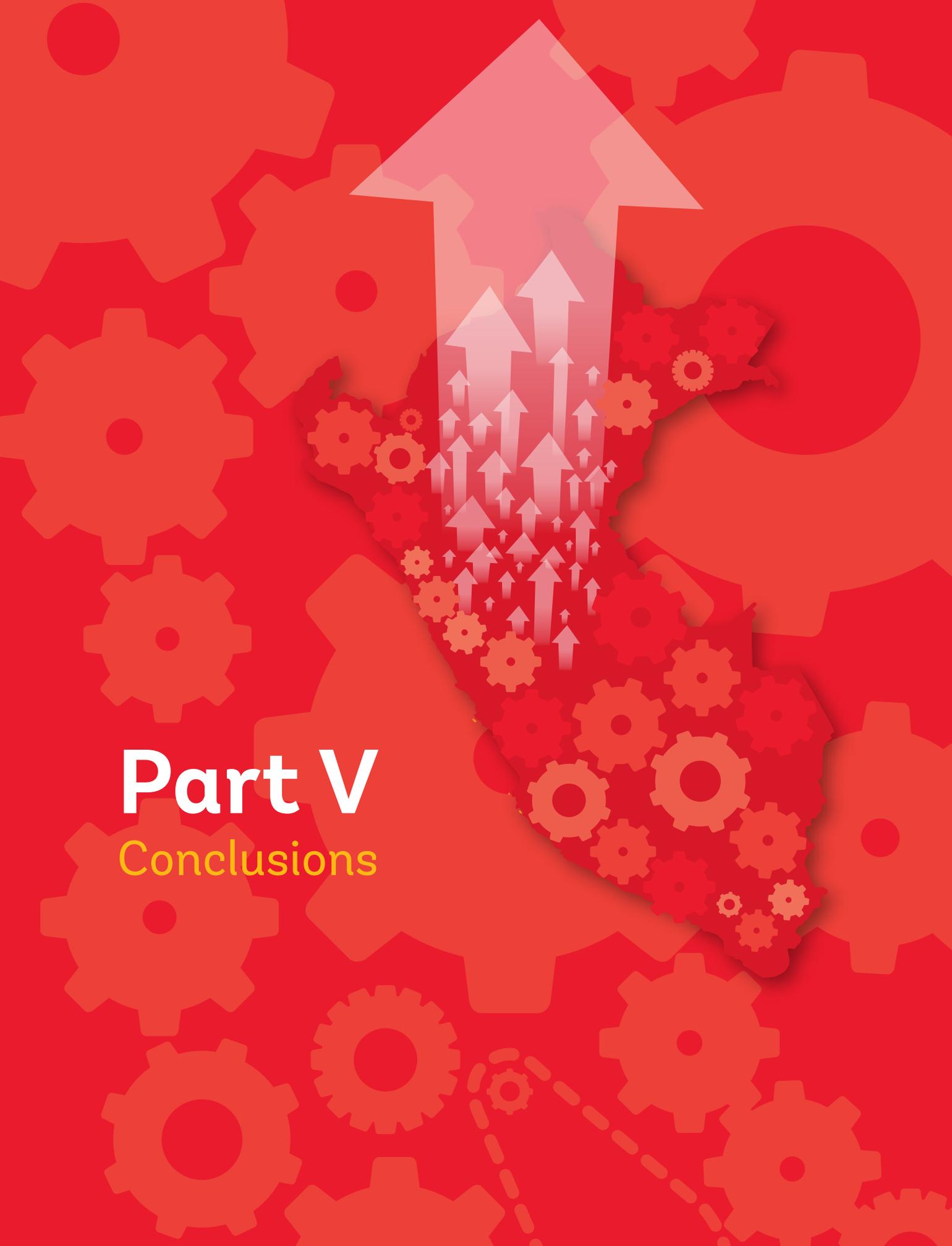
The improvement of agencies that diffuse existing technology from abroad to local firms, particularly small and medium-size enterprises, could help boost productivity. More specific actions could include improving the capacity of the CITEs (*Centros de Innovación Tecnológica Empresarial*) by introducing a performance-oriented approach and revising their goals, operation, governance, and management capacity. The centers that serve the “Pisco” industry in Peru have shown a potential path for these type of agencies.

Horizontal policies are also important. By ensuring equal access to innovation avenues and financing for small firms, such policies would improve factor allocation toward more productive firms. Policies aimed at correcting misallocation, such as easing regulatory burden on start-ups (Section 5), elimination of firing constraints (Section 6), improving access to credit (Section 7), or increasing imports that provide technology spillovers (Section 8), would also positively impact incentives to innovate and innovation outcomes. Opening the research and university system to different forms of knowledge transfers and collaboration with the private sector would also be helpful. Moreover, enabling better use of knowledge entails improving the governance and the legal rights enforcement for institutions and companies to engage in collaboration and innovative ventures.

Figure 94. Share of firms receiving public support to finance innovation



Source: Ministry of Production, Peru.



Part V

Conclusions

Peru has emerged as a new growth star in the Latin America and Caribbean region, with prosperity widely shared among its 30 million people. Peru's economy was the second-fastest growth performer in the region over the last decade, with per capita income doubling— well ahead of the region as a whole. Since 2000 almost a quarter of Peru's population has broken free of poverty, and inequality plummeted at one of LAC's fastest rates. Across the country, lower-income households, the bottom 40 percent, have seen their income grow more than 2 percentage points faster than that of the average income. While the country struggled to converge in the 1970s and 1980s, the speed of convergence recovered in the mid-1990s, and accelerated like never before over the last decade. Throughout this period of growth and good external conditions, and unlike many countries, Peru saved the windfall, leaving itself with significant savings to continue to afford needed investments in infrastructure and with strong macroeconomic buffers to face more challenging times.

A portion of Peru's growth has been driven by improvements in productivity, but in the next stage of convergence, and under the new external conditions, a larger contribution to economic growth will have to come from higher productivity. Although the country's productivity growth at the company level is at par with similar middle-income countries that aspire to avoid the middle-income trap, the gap to the global productivity frontier of higher-income countries remains large. This report showed that enhancing productivity growth remains the fastest way to close it.

There is firm-level evidence that Peruvian markets tend to misallocate labor and capital into less-productive workplaces. This signals that some aspects of product, factor, and intermediate goods and services markets do not function properly.

The country's services sector is a chronically poor performer in this regard. This weakness has hurt overall productivity and output directly and also indirectly by crippling an intermediate goods and services market that could spur exports and production in other sectors such as manufacturing. Eliminating these distortions could increase overall productivity by up to 130 percent and double Peru's output per worker.

Reducing those frictions will spur productivity growth, but that in turn requires deepening key reform areas. Macroeconomic and structural reforms over the last 20 years have played a central role in Peru's growth. But the path toward higher income status, including in the context of a less-benign external environment, hinges on reducing market frictions that lead to inefficient allocation of resources and enabling the environment for firms to grow. Such growth would require a suite of microeconomic reforms that are challenging, but are doable and within reach of public policy in Peru. Specific policy directions include (i) reducing costs of entry and operation that hamper SMEs' growth and reduce competition pressures in the market; (ii) reducing the rigidities imposed by labor laws, allowing employers more flexibility, which could also help reduce the informal sector that hampers overall productivity; (iii) improving quality of education, particularly higher secondary education and training, to improve the skills match between labor supply and demand, which also has an effect on reducing informality; (iv) deepening the financial sector, particularly to reduce borrowing costs for SMEs so they can invest in their growth; (v) improving infrastructure, with a focus on infrastructure for trade, logistics, and facilitation as well as lifting other behind-the-border constraints to trade; and (vi) improving the innovation framework to help firms innovate and adopt new technologies, enabling them to compete in different markets.

Annex

Background papers prepared for this report

	Background paper title	Authors	GPs
1	Reforms and growth	Nikita Céspedes and Patricia Lengua-Lafosse	Peru MEF and BCRP
2	Economic growth in Peru	Cristina Savescu and Ekaterina Vostroknutova	GMFDR
3	The middle-income trap and Peru	Harry Moroz and Ekaterina Vostroknutova	GTIDR, GMFDR
4	Disentangling (more than) two decades of fast growth in Peru	Daniel Barco and Ekaterina Vostroknutova	GMFDR
5	Growth, poverty & shared prosperity in Peru	Elizaveta Perova, Maria Eugenia Genoni, Anna Bonfert, and Santiago Garriga	GPVDR
6	Regional productivity convergence in Peru	Leonardo Iacovone, Luis Fernando Sanchez Bayardo and Siddharth Sharma	GTCDR, DECWD
7	Firm-level convergence of productivity in Peru	Leonardo Iacovone and Trang Thu Tran	GTCDR, DECWD
8	The role of imports for exporter performance in Peru	Martha D. Pierola Castro, Ana M. Fernandes, and Thomas Farole	DECTI, GCJDR
9	Policy actions for improved competitiveness	Thomas Farole and Juan Julio Gutierrez	GCJDR
10	Innovation and firms' productivity in Peru	Ha Nguyen, Patricio Jaramillo and Ekaterina Vostroknutova	DECMG, GMFDR
11	Innovation system in development –the case of Peru	Pluvia Zuniga	GTCDR
12	Investment climate and competitiveness in Peru	Alvaro Quijandria, Ernesto Franco-Temple, Jessica Michelle Victor, and Peter Kusek	GTCDR
13	Peru—Tackling regulatory barriers to competition and local economy development	Martha Licetti, Donato de Rosa, Tanja Goodwin, Congyan Tan, Lucia Villarán, and Rachel Li Jiang	GTCDR, GMFDR

Annex

	Background paper title	Authors	GPs
14	Services trade performance and productivity in Peru: A competitiveness analysis	Sebastian Saez and Erik L. Van der Marel	GTCDR
15	Measuring Peru's integration into global value chains	Thomas Farole, Daria Taglioni, Guillermo Arenas	GCJDR, GTCDR
16	Peru in the table grape global value chain: opportunities for upgrading	Karina Fernandez-Stark, Penny Bamber, and Gary Gereffi	Duke Center on Globalization, Governance & Competitiveness
17	Peru in the high quality cotton textile and apparel global value chain: opportunities for upgrading	Karina Fernandez-Stark, Penny Bamber, and Gary Gereffi	Duke Center on Globalization, Governance & Competitiveness
18	Peru in the mining equipment global value chain: opportunities for upgrading	Karina Fernandez-Stark, Penny Bamber, and Gary Gereffi	Duke Center on Globalization, Governance & Competitiveness
19	Jobs in Peru: dynamics, constraints and policy implications	Elizabeth Ruppert Bulmer, Mathilde Perinet, Angela Elgir, David Robalino	GCJDR
20	Firms dynamics in Peru: analysis of jobs and productivity	Reyes Aterido and Leonardo Iacovone	GCJDR, GTCDR
21	Giving Peru a productivity boost: towards a system of continuous education and training	Gustavo Yamada, Jamele Rigolini, and Pablo Lavado	LCC6C
22	Tertiary education in Peru	Javier Botero	GEDDR
23	XXI century challenges in education in Peru	Inés Kudó and Miguel Székely	GEDDR, DFGPE
24	Considerations of the decentralization process in Peru	Carolina Rendon, Adrienne Hathaway, and Katherine Grau	GGODR
25	TFP gains from removing input-output distortions in Peru	Roberto Fattal	DECMG

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