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FROM LANDLOCKED TO LAND OF OPPORTUNITY

PARAGUAY COUNTRY ECONOMIC MEMORANDUM

WORLD BANK GROUP

This report has been prepared using data available as of May 1, 2023.

Acknowledgments

"From Landlocked to Land of Opportunity", a Country Economic Memorandum for Paraguay, was prepared under the leadership of Marianne Fay (Country Director for Argentina, Paraguay, and Uruguay), Matilde Bordon (Resident Representative, Paraguay) and Robert Taliercio O' Brien (Advisor to the Vice President, Latin America and the Caribbean). The team benefited from guidance from Doerte Doemeland (Practice Manager for Macroeconomics, Trade and Investment for Latin America and the Caribbean, or MTI LAC) and William F. Maloney (Chief Economist, Latin America and the Caribbean).

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The team thanks the peer reviewers for their helpful suggestions and insights: Augusto de la Torre (Professor, Columbia University); Cristina Savescu (Senior Economist); David Olivier Treguer (Program Leader) and Joshua Gill (Economist). Additional guidance was received from Ana Maria Áviles (Lead Country Economist); Arthur Bragança (Senior Environmental Specialist); Fernando Giuliano (Senior Economist); Shaun Mann (Senior Private Sector Development Specialist), Sebastian Saez (Former Senior Economist) and Erik Von Uexkull (Senior Economist).

The National Statistical Office (INE) of Paraguay, especially the Directorate of Firms, Establishments and the Environment, played a critical role in designing, executing and cleaning data from the survey used in Chapter 2. The team also thanks the 33 Paraguayan enumerators, supervisors, and technicians for their tireless work in implementing the survey in March 2023.

Consultations and discussions with various representatives of the Government of Paraguay — including the Ministry of Economy and Finance, the Central Bank of Paraguay, the Ministry of Industry and Commerce, the Ministry of Work, Employment and Social Security (MTESS), the Tourism Secretariat (SENATUR), the municipal government of Hernandarias and the state government in Alto Parana — as well as private sector representatives were invaluable in the preparation of the report.

Víctor Aveiro, Telma Alvarenga, Rosa Arestivo, Gaspar Cabrera, María del Mar Britez, María Eugenia Echague, Myriam Franceschini, Adriane Landwehr, Mariela Laterra Silva, Giselle Velásquez, and Benjamin Vuilleminroy provided invaluable administrative support. Yanina Budkin, Darmy Martínez Larroza, and Gregory Ross advised the team on communications. Ana Laura Segovia translated the report into Spanish.

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Acronyms

BCP	*Banco Central del Paraguay* or Central Bank of Paraguay
CAH	*Crédito Agrícola de Habilitación*
CBAM	Carbon Border Adjustment Mechanism
CCDR	Country Climate and Development Report
EPH	*Encuesta Permanente de Hogares*
EPHC	*Encuesta Permanente de Hogares Contínua*
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
GDP	Gross domestic product
GVC	Global value chain
HA	Hectares
ICT	Information and communication technology
IDB	Inter-American Development Bank
INDERT	*Instituto Nacional de Desarrollo Rural y de la Tierra*
INE	*Instituto Nacional de Estadística*
INFONA	*Instituto Forestal Nacional*
IPTA	*Instituto Paraguayo de Tecnología Agraria*
ITU	International Telecommunication Union
KG	Kilogram
KW	Kilowatt
LAC	Latin America and the Caribbean
MADES	Ministry of Environment and Sustainable Development
MAG	Ministry of Agriculture and Livestock
MERCOSUR	*Mercado Común del Sur*
MEF	Ministry of Economy and Finance
MOU	Memorandum of Understanding
NPA	National Protected Area
OECD	Organization for Economic Co-operation and Development
PPP	Purchasing Power Parity
PROMAFI	*Proyecto de Mejoramiento de Ingresos de la Agricultura Familiar e Indígena*
PWT	Penn World Tables
PYG	Paraguayan Guarani
R&D	Research and Development
RUC	*Registro Unico de Contribuyente*
SENACSA	*Servicio Nacional de Calidad y Salud Animal*
SENATUR	*Secretaria Nacional de Turismo*

SENAVE	*Servicio Nacional de Calidad y Sanidad Vegetal y de Semillas*
SINAFOCAL	*Sistema Nacional de Formación y Capacitación Laboral*
SME	Small and medium-sized enterprises
TFP	Total factor productivity
UMIC	Upper middle-income country
UN	United Nations
UNCTAD	United Nations Conference on Trade and Development
UNWTO	World Tourism Organization
US	United States
USA	United States of America
USDA	United States Department of Agriculture
WB	World Bank
WBES	World Bank Enterprise Survey
WDI	World Development Indicators
WEF	World Economic Forum
WTTC	World Travel and Tourism Council

Chapter 1 —
Looking back to look forward: how can Paraguay accelerate its transition to a high income economy?

Key messages

- Paraguay has been a beacon of macroeconomic stability, but like the rest of the region, its average growth has moderated since 2013, which has affected the pace of poverty reduction.
- To accelerate growth and poverty reduction, it is important to continue to increase resilience against external shocks, productivity, and the sustainability of growth.
- Improving the quality and efficiency of public institutions, market efficiency, innovation, education, and infrastructure will promote economic productivity.
- Diversifying exports away from unprocessed commodities will strengthen economic resilience but will be a lengthy process. Meanwhile, the continued commitment to stable macroeconomic and fiscal policies, a deepened financial sector, and risk mitigation policies will increase economic resilience.
- Paraguay does not have to choose between profitability and sustainability: both are possible and complementary. Greener growth will yield a stronger, more prosperous economy.

The current growth model has yielded prosperity, but gains have slowed

Paraguay has maintained a steady pace of growth since the early 2000s. Between 1990 and 2002, due to various political and economic events, real GDP grew at an average annual rate of 1.9 percent.[1] As a result of important reforms to achieve greater stability, subsequent decades ushered in more prosperity. From 2002 to 2022, the Paraguayan economy grew annually at an average 3.6 percent, outperforming the region and other upper middle-income countries (UMIC).[2] Reflecting this rapid pace of growth, poverty (as measured by the international poverty line for upper middle-income countries, USD 6.85/day in 2017 PPP) halved to 19.9 percent by end-2022. Inequality, as measured by the Gini coefficient, also fell from 57.3 to 45.3 points between 2002 and 2022.

Much of this progress can be explained by Paraguay's success in leveraging its natural resource abundance. Despite being a landlocked country, Paraguay is blessed with ample land, fertile soils, and two rivers that generate more hydropower energy than it can currently consume through binational dams with Argentina and Brazil. As such, Paraguay is rich in natural capital, which accounts for 16 percent of its total wealth[3] — a higher share than comparable countries (World Bank 2021a). This reflects Paraguay's relative wealth in crop and pastureland, as

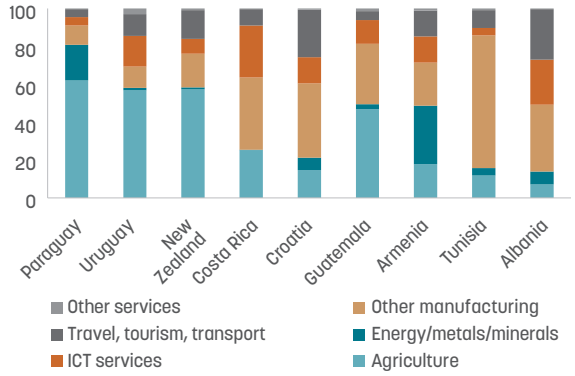
[1] Refers to compound annual growth rate, using figures at constant values. Source: WDI.
[2] Applies to all following references of average values of Paraguay's peers, except when indicated otherwise.
[3] The other components of a country's wealth are human capital and productive capital.

well as in renewable energy. Today, it is among the world's largest exporters of soybeans, beef, and electricity. Cumulatively, agriculture and hydropower make up 81 percent of direct exports — higher than its structural[4] and aspirational[5] peers (Figure 1).

A solid macro-fiscal framework has underpinned growth. Bolstered by institutional improvements in the management of the economy, Paraguay has avoided large macroeconomic imbalances since the early 2000s. The government enacted tax and pension reforms in 2003, began to move towards an inflation targeting regime in 2004, and passed a Fiscal Responsibility Law in 2013 which caps annual budget deficits at 1.5 percent of GDP and real recurrent spending growth at 4 percent (Charotti et al. 2021). It has also maintained a singular, flexible exchange rate. For most of the last two decades Paraguay has thus recorded inflation on par with the regional average, run a small current account surplus and registered a much smaller central government fiscal deficit than peers, averaging 0.1 percent of GDP over 2003-2018 (Figure 2). Despite increasing significantly during the COVID-19 pandemic, public debt stood at 36.1 percent of GDP at the end of 2022, among the lowest of its peers.

Figure 1. Paraguay's growth has been driven by its successful use of natural resources...

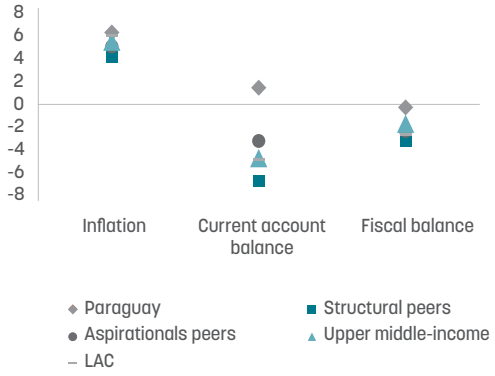
Share of total exports, percent



Source: UN COMTRADE and World Bank World Development Indicators (WDI).
Note: Data refer to 2021. Structural peers are Guatemala, Armenia, Tunisia, and Albania.

Figure 2. ...and underpinned by a strong macro and fiscal framework since the early 2000s.

Average year-on-year growth between 2002-2019, percent (inflation)/average share of GDP between 2002-2019, percent (current account balance and fiscal balance)



Source: Staff calculations using WDI.
Note: Unweighted averages for peer groups.

Paraguay has sought to distinguish itself by being relatively open to trade and investment, and by maintaining a low tax burden. Paraguay's trade-to-GDP ratio[6] was 74 percent in 2022, 17 percentage points higher than the average LAC country. This is in part because it maintains a lower simple average tariff than Argentina, Brazil, and Uruguay,[7] although higher than the regional

[4] This report also benchmarks Paraguay against its "structural peers": countries that are similar in population size, demographics, gross national income (GNI) per capita, size of the state and other criteria. Following World Bank (2018), these are defined as Guatemala, Armenia, Albania and Tunisia. See Annex 1 for more.

[5] Aspirational peers are countries that are structurally similar to Paraguay, but that have managed to reach higher per capita income levels. These are defined as Uruguay, New Zealand, Croatia, and Costa Rica. See Annex 1.

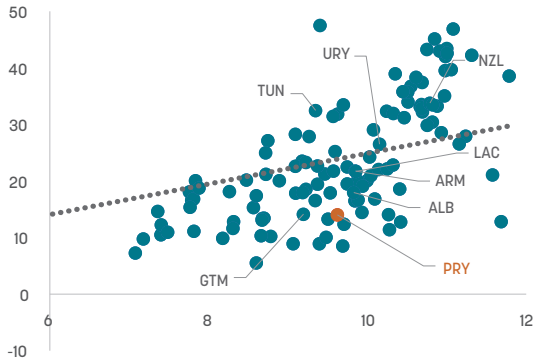
[6] The sum of exports and imports of goods and services over GDP. Source: WDI.

[7] Paraguay's simple average tariff in 2019 was 9.6%, lower than that of Argentina (13.3%), Brazil (11.1%) and Uruguay (10.1%). Source: World Bank 2022b.

average. Moreover, at 9.9 percent of GDP,[8] Paraguay has a relatively low tax burden compared to these countries and all other peers except Guatemala (Figure 3). The "10-10-10" model, referring to statutory rates of corporate, personal, and value-added taxes, is widely viewed by policymakers as a key value proposition of the economy. Finally, Paraguay also has maintained a relatively open foreign direct investment (FDI) regime since 1991 and offers a range of tax exemptions, including on capital investments of national and international origin, and foreign firms established under the *maquila* regime.[9] Despite the low tax burden and the provision of these incentives, which amount to approximately 1.3 percent of annual GDP,[10] net FDI inflows into Paraguay averaged only 1.2 percent of GDP between 2013 and 2019, roughly a third of the amount received by peers (Figure 4). However, FDI rose to 1.7 percent of GDP in 2022, and a record amount of greenfield investments (over 10 percent of GDP) in pulp, biofuels and green hydrogen have been announced recently.

Figure 3. Paraguay has tried to lure investment through low tax rates...

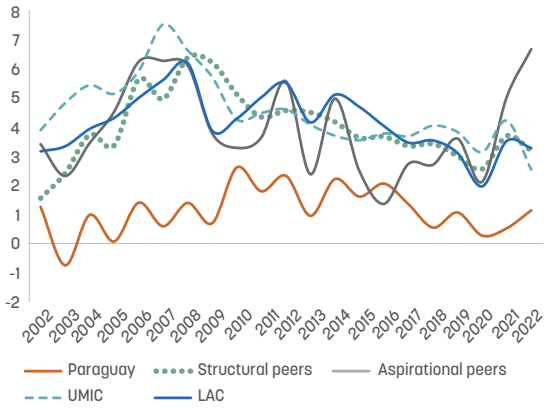
Y-axis: tax and social security contributions as share of GDP; X-axis: log GDP per capita (current USD)



Source: OECD and WDI, staff calculations.
Note: Includes social security contributions. Average from 2019 to 2023.

Figure 4. ...but FDI has trailed peers.

Net FDI inflows, percent of GDP



Source: Staff calculations using WDI and BCP.
Note: Unweighted averages for peer groups.

Although this growth model has delivered some gains, there are indications that it will need to evolve to lift Paraguay to the next stage of prosperity. First, even before the COVID-19 pandemic hit, the engines of growth had begun to slow. While Paraguay's real per capita income growth[11] averaged 3.3 percent per year between 2002-2013, this pace slowed to 1.9 percent over 2013-2019 — ahead of regional peers, but slower than structural and aspirational peers and other upper-middle income countries (Figure 5). During 2019-2022, real per capita income growth

[8] Refers to the average from 2019 to 2023. The collection ratio is 14 percent of GDP, including social security contributions. Source: World Bank calculations with Situfin data.

[9] Established in 2000, the maquila regime promotes the entry of foreign companies that import intermediate goods into Paraguay under a duty-free regime before processing/assembling and re-exporting them. Maquila companies are exempted from all taxes except a 1 percent duty on value added within the country. See PwC (2018).

[10] Data received from DNIT and refers to 2022.

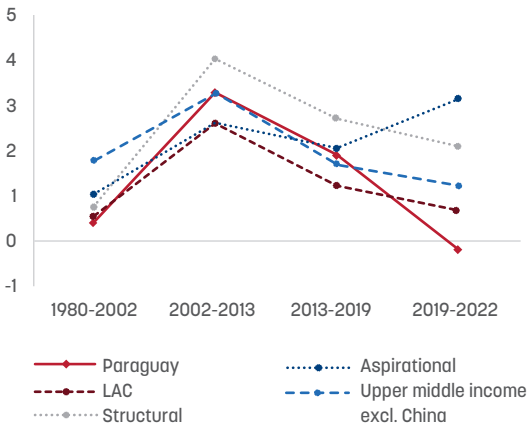
[11] GDP in real terms divided by the total population. Source: WDI database from the World Bank. Population data is from the 2022 UN *World Population Prospects*. According to preliminary results of the 2022 National Population and Housing Census, the Paraguayan population may have been lower than thought since 2012, which would affect these calculations. However, the final census data had not been published nor presented to the UN's WPP at the time of this report's publication.

fell by 0.2 percent per year on average, more so than peers. This slowdown was not due solely to the COVID-19 pandemic in 2020, which Paraguay weathered relatively well,[12] but also to a severe and recurring drought, and to high inflation exacerbated by Russia's invasion of Ukraine in 2021.

Average labor incomes have steadily fallen since 2013, contributing to a smaller reduction in poverty. Between 2002 and 2013, average labor income had risen rapidly in Paraguay by 3 percent per year,[13] leading to a significant fall in the proportion of Paraguayans living below the international poverty line (USD 6.85 per day per person), from 51.7 percent to 23.3 percent. These improvements outpaced the average country in the LAC region (Figure 6). However, average labor income fell by 1 percent per year between 2013 and 2019, and subsequently by 2 percent per year over 2019 to 2022. As a result, poverty reduction has proceeded more slowly since 2013. At the end of 2022, the share of Paraguayans living below the international poverty line of USD 6.85 per day has stagnated at 19.9 percent, although still below the average LAC country (Figure 6). Between 2021 and 2022, extreme poverty[14] increased from 4.1 to 5.6 percent and inequality rose from 42.9 to 45.1 Gini points due to extreme drought and the rise in inflation.

Figure 5. Paraguay's average growth has slowed since 2013...

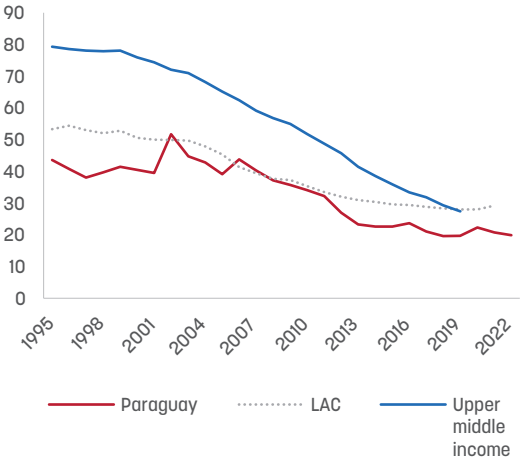
Compound average annual growth rate of real GDP per capita (2015 USD), percent



Source: Staff calculations using WDI.

Figure 6. ...leading the pace of poverty reduction to stall at about a fifth of the population.

Poverty rate, USD 6.85 per day per person (2017 PPP)



Source: Staff calculations using WDI.

Second, large human development gaps persist, which could limit inclusive growth. According to the World Bank Human Capital Index or HCI (World Bank 2021b), children born today in Paraguay are expected to be only 53 percent as productive when they grow up as they could be if they enjoyed complete education and full health — lower than regional and income peers (56 percent). This reflects lower primary and secondary school completion rates, as well as higher infant and maternal mortality rates (Figure 7). Moreover, there is high inequality of opportunity: the

[12] Paraguay's economy contracted by 0.8 percent in 2020, far less than the median LAC and upper middle-income country (-8 and -6.2 percent, respectively).

[13] Average labor income from the main occupation is calculated from the household survey and expressed in real terms (2021 Guaranies). The survey does not include the regions of Boquerón and Alto Paraguay.

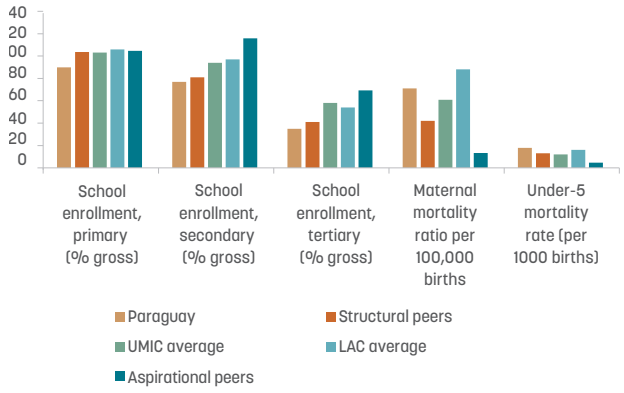
[14] As measured by the share of the population living under USD 3.65 per person per day (2017 PPP).

richest quintile of households performs 28 percent better on the HCI than the lowest (poorest) quintile. There are also large gaps between urban and rural areas[15] in accessing basic services such as clean drinking water, improved sanitation, waste disposal and broadband Internet[16] (World Bank 2018a). Human capital gaps have likely widened after the COVID-19 pandemic. It is estimated that pandemic-induced learning losses amounted to three-quarters of a year's worth of schooling in Paraguay, higher than the regional average (Bracco et al. 2022).

Limited and inefficient public spending makes it difficult to close these gaps. Despite underperforming the region on a range of health and education outcomes, Paraguay spends only about 3-4 percent of GDP in these areas, lower than peers, especially in the latter case (Figure 8). All in all, the IMF (2022a) estimates that Paraguay needs to spend an additional 7 percent of GDP to close gaps with the best-performing UMICs in key Sustainable Development Goals related to education, health, water and sanitation, and roads infrastructure. Public spending could also be more efficient: in 2018, the cost of inefficiency in public spending in Paraguay was estimated at 19 percent of total spending or 3.9 percent of GDP (Izquierdo et al. 2018 and World Bank 2022a). Improving the efficiency and effectiveness of public spending could improve the trust of Paraguayans in government. At the beginning of 2023, 82.7 percent of Paraguayans surveyed by Latinobarómetro said that they had "little" or "no" confidence in government, above the regional average of 67 percent (Latinobarómetro 2023; see Box 5).

Figure 7. Despite improvements, educational and health outcomes still remain behind compared to peers...

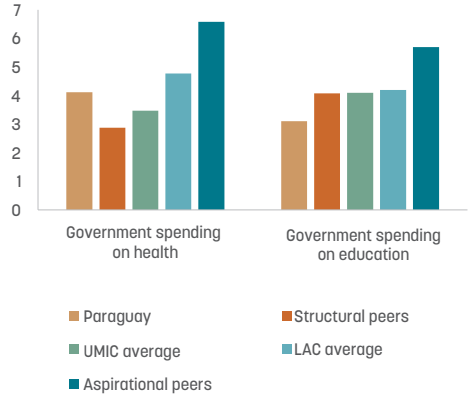
Percent of total/per 100,000 and 1000 births



Source: Staff calculations using WDI.

Figure 8. ...which may reflect lower public spending in these areas, and inefficiency in spending.

Government expenditure, percent of GDP



Source: Staff calculations using WDI.

Most of the workforce lacks adequate protection to buffer against economic shocks. According to INE, it is estimated that at least 63 percent of Paraguayans working in non-agricultural sectors have informal[17] jobs as of late 2022, i.e., they lack social security benefits and other worker

[15] 38 percent of Paraguay's population lives in rural areas, one of the highest shares in the region.

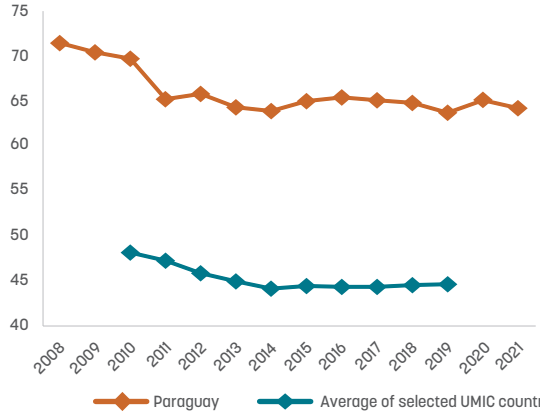
[16] For example, while 97 and 94 percent of households in urban areas have access to improved sanitation and drinking water, these shares fall to 77 and 86 percent respectively in rural areas. While 79 percent of urban households used public waste disposal systems, only 11 percent of rural households had access to such services.

[17] Informal workers are defined as salaried workers without a pension plan or health insurance, or self-employed workers who do not have a tax registration number or *Registro Unico de Contribuyente* (RUC). This information is only available from 2008 onwards in the EPH.

protection (Figure 9). The high informality rate has persisted despite slight improvements over 2002-2013, and despite the large gains of being a formal worker (Box 1). The informality rate is particularly high for younger and older workers (Figure 10), women[18], and for those in rural areas. Overall, the likelihood of getting a formal job has fallen compared to the previous decade (Rojas and Yoong 2022).

Figure 9. Informal employment is more prevalent in Paraguay compared to peers...

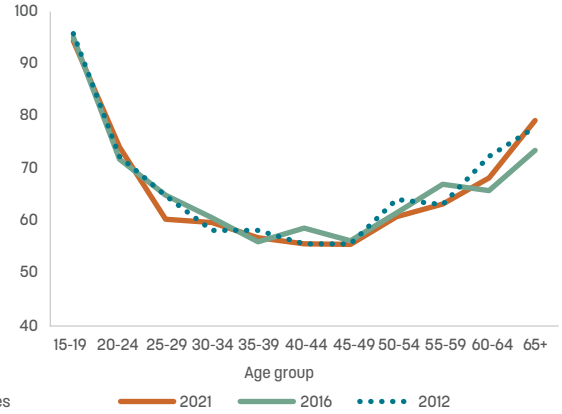
Share of informal workers, percent of total



Source: INE and ILO, staff calculations.
Note: Excludes the agriculture sector and the departments of Boqueron and Alto Paraguay.

Figure 10. ...especially for younger and older workers.

Share of workers in informal employment, percent



Source: INE, staff calculations.

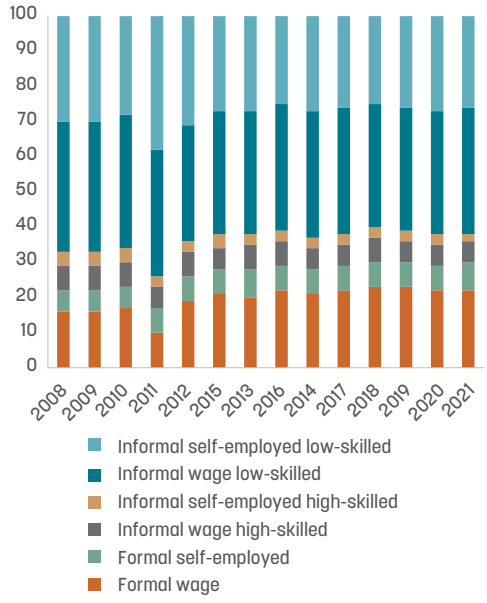
Box 1. Paraguay's Jobs Ladder

To better understand the evolution of job quality over time, Paraguayan workers are ranked on a 'jobs ladder' following the methodology in Fields et al. (2023) and using household survey data. At the top of the ladder are formal salaried and self-employed workers, where 'formal' is defined as having benefits such as social security and having a registration number in the case of the self-employed. In the middle of the ladder are informal high-skilled workers, who do not have benefits but have some professional skills (i.e., managers, professionals, technicians, and clerks). At the bottom of the ladder are informal low-skilled workers. Three insights emerge:

i. **There are large differences between formal and informal workers.** In 2008, only 33 and 24 percent of salaried and self-employed workers, respectively, were formally employed. These shares have increased to 40 and 30 percent, respectively, in 2021 (Figure 11). Nonetheless, there is a big and persistent difference between the 'top' and the 'bottom' of the jobs ladder. On average, formal self-employed workers earn nearly five times more than informal, low-skilled, and self-employed workers (Figure 12).

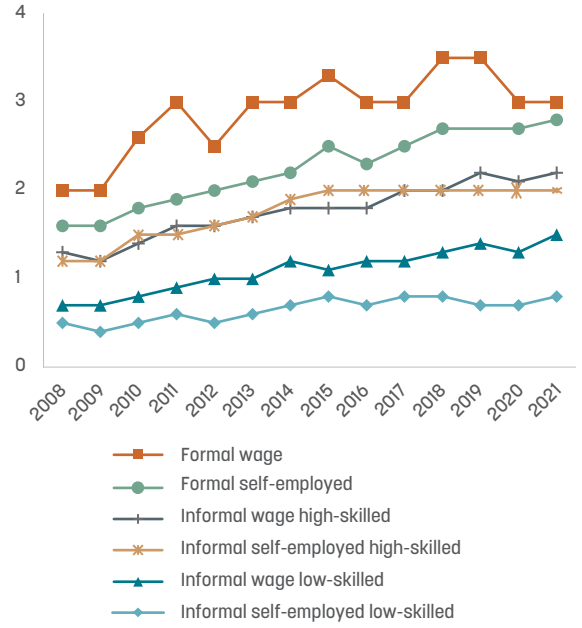
[18] Perry et al. (2007) find that married women are more likely to enter into informal self-employment due to the flexibility that such jobs tend to offer.

Figure 11. Formalization has increased, but only 3 out of 10 workers are formal...
Share of workers, percent of total



Source: EPH, staff calculations.

Figure 12. ...despite the difference in earnings between formal and informal workers.
(Median income, millions of Guaraníes in Oct 2021 terms)



Source: EPH, staff calculations.

ii. **There are variations in median income even among informal wage earners.** In 2009, the average high-skilled informal worker earned 2 to 2.5 times more than their low-skilled counterpart. By 2021 this gap had decreased to 1.5 times for salaried workers but remained larger for self-employed workers.

iii. **Wage growth has slowed for all groups of workers since 2013.** All groups of workers experienced slower real median income growth over 2013-2021 compared to the previous period. Formal wage workers fared slightly better than other groups as their real median income increased by about 3.7 percent per year between 2013-2021.

Third, the current growth model, which depends on the conversion of native forests to crop and pastureland, could face long-term risks. Over the past few decades, Paraguay has increased its production of soybean and beef through the conversion of native forests to crop and pastureland. This process has led to a decline in native forests, losing nearly a third of its tree cover or 5.6 million hectares between 2002 and 2022 (INFONA 2022). Today, it is estimated that less than 10 percent of the original Atlantic Forest remains in Paraguay (da Ponte et al. 2017), and two-thirds of the original forest cover in the Paraguayan Chaco[19] (da Ponte et al., 2022). The conversion of forest into crop and pastureland will eventually reach a natural physical limit and could thus affect the competitivity of Paraguay's agricultural exports in the future. As production

[19] The Chaco is an immense lowland that extends through the territories of Paraguay, Argentina, Bolivia and a small portion of Brazil, occupying more than 1 million square kilometers. It is the second largest forested region on the continent, after the Amazon, and is home to a great diversity of ecosystems, including the largest dry forest in the world. Source: Gill et al. (2020).

gets pushed into more marginal areas, and as important ecosystem services such as watershed protection and soil erosion become depleted, it could endanger agricultural productivity. Moreover, with growing global demand for more sustainable production, Paraguay could run the risk of being left out of more advanced economies where it could charge a premium for its export products, unless it adopts appropriate measures (Box 2).

Box 2. What could be the impact of green trade regulations on Paraguay?

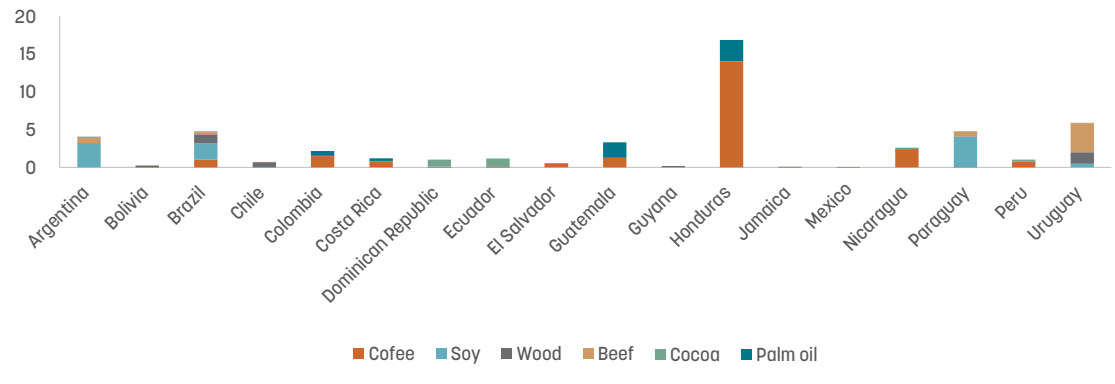
The European Union Carbon Border Adjustment Mechanism (CBAM) is part of a package of measures that are intended to reduce the EU's greenhouse gas (GHG) emissions by at least 55 percent in 2030 compared to 1990 levels (European Commission 2023). It is a fee that would be levied starting in 2026 on direct emissions from energy-intensive industries and electricity sectors, based on the estimated carbon content of the trading partner. In this first stage, the impact of CBAM on Paraguayan exports to the EU is expected to be very small as it would only impact direct emissions.

The EU Regulation 1115/2023, approved in May 2023, prohibits the trade of primary materials and products derived from deforestation and environmental degradation. The law requires firms involved in the trade of beef, cacao, coffee, palm oil, soy, wood, and products derived from these resources to conduct an exhaustive due diligence throughout the value chain. The goal is to ensure that goods are not linked to deforestation, forest degradation, or violation of local environmental and social laws enacted after December 31, 2020. The new rules will be applicable starting on December 30, 2024.

Deforestation-free product regulations could affect at least 5 percent of total exports, mostly soy (Figure 13). This is a lower bound estimate that excludes the indirect effects through exports to other countries which subsequently export to the EU (e.g., the export of soybean oil via Argentina). The magnitude of the impact could increase if the United States or other major markets follow suit. If Paraguay can prove that its agricultural production is indeed 'deforestation-free', this would enable it to expand its access to more 'premium' markets than its present trading partners, in addition to mitigating the impact of EU Regulation 1115/2023 and similar regulations.

Figure 13. At least 5 percent of Paraguay's exports would be affected by the new EU deforestation-free regulation

Share of total exports, percent



Source: Conte Grand, Schulz-Antipa y Rozenberg 2023.

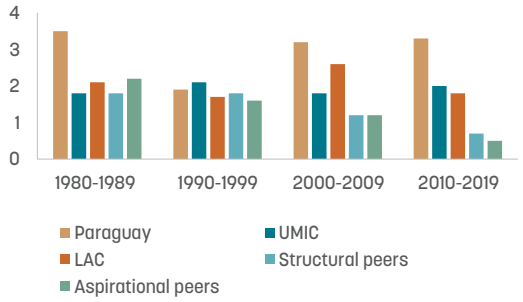
These three challenges — (i) slower growth over the past decade, (ii) persistent gaps in human capital, and (iii) high dependence on natural resources — indicate the need to adjust various aspects of Paraguay's growth model. To achieve faster, more inclusive, and more sustainable growth, Paraguay needs to build greater resilience to shocks, boost the productivity of firms to create more 'good' jobs, and better manage its natural resources. The following sections expand the argument on why this is the case.

Why does Paraguay need to boost its resilience to external shocks?

Paraguay could maintain longer periods of high growth if it is able to accelerate the diversification of its exports, beyond a few primary products. Despite stable macroeconomic policies, Paraguay's growth remains more volatile[20] than peers (Figure 14). This is because of its high dependence on natural resources (Figure 15), which are vulnerable to a range of shocks. Natural resource-linked sectors — primary agriculture, agroindustry, electricity, and water — still account directly for a third of total output[21] and 80 percent of direct exports. The structure of the economy has evolved very slowly over time: 11 percent of Paraguay's real value added still comes from primary agriculture (Figure 16), about the same as in 2002, whereas this share has fallen and is closer to 7 percent in other UMICs today (Figure 17). Half of all manufacturing activity also relies on the processing of agricultural commodities. Because the Paraguayan economy is much less knowledge-intensive[22] and its exports are more highly concentrated in a smaller number of products than peers,[23] extreme weather events have an immediate and direct transmission to the rest of the economy. Together, changes in rainfall and external factors including the terms-of-trade explain half of the cyclical variance of Paraguay's real GDP.[24]

Figure 14. The volatility of Paraguay's growth has diminished, but remains higher than peers...

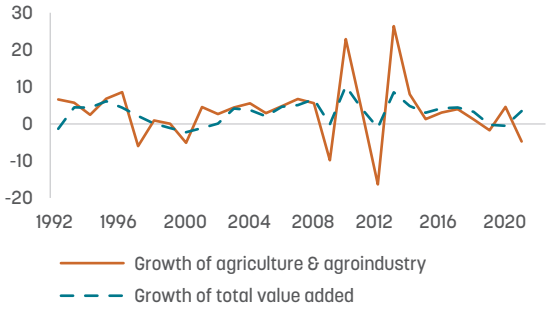
Standard deviation of per capita income growth, percent



Source: Staff calculations using WDI.
Note: Unweighted averages for peer groups.

Figure 15. ...due to its high dependence on natural resources.

Year-on-year growth in real value added, percent

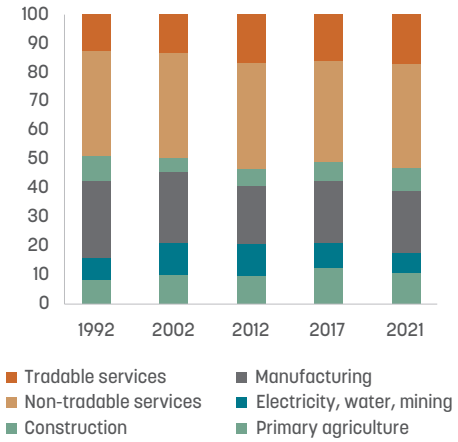


Source: Staff calculations using BCP data.

[20] As measured by the standard deviation of per capita income growth over time and in PPP. However, the results do not change even when volatility is measured as the cyclical component of GDP.
[21] Sum of primary agriculture (including livestock, forestry, fishing, mining), agroprocessing, electricity, and water.
[22] Paraguay ranks 80th out of 131 countries on the OEC's ranking of economic complexity.
[23] As measured by the Herfindahl-Hirschmann index. Paraguay's product concentration was 0.339 in 2021, higher than the Latin American average (0.265) and the average aspirational/structural peer (0.199).
[24] From a vector autoregressive model using quarterly data from 2000 to 2020. The other half of the variation in real GDP is explained by domestic factors such as investment, government expenditure and the domestic interest rate. This analysis is based on World Bank (2018).

Figure 16. The structure of the Paraguayan economy has evolved more slowly...

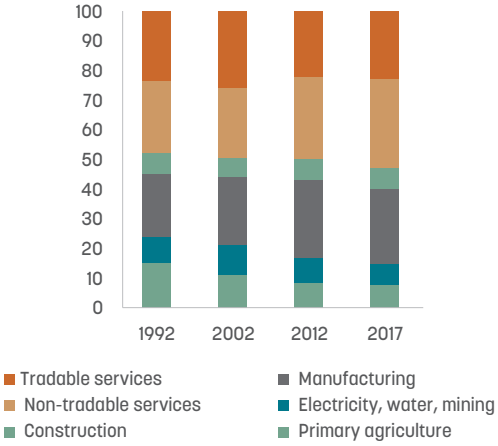
Share of total value added in constant 2014 Guarani values, percent



Source: Staff calculations using BCP data.
Note: Half of manufacturing value added consists of agroprocessing. Mining value added is zero.

Figure 17. ...compared to the average upper middle-income economy.

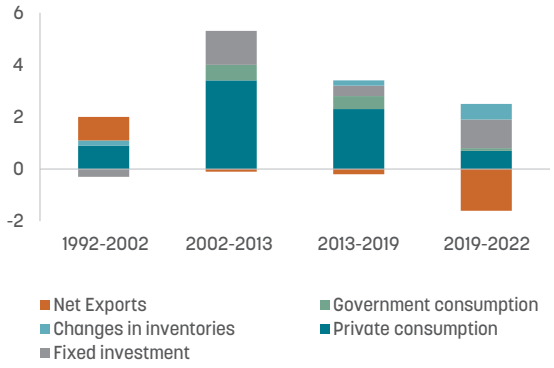
Share of total value added in constant 2017 PPP, percent (weighted average for all UMICs)



Source: Staff calculations using PWT version 10.0.

Figure 18. The commodity boom led to a strong expansion in private consumption...

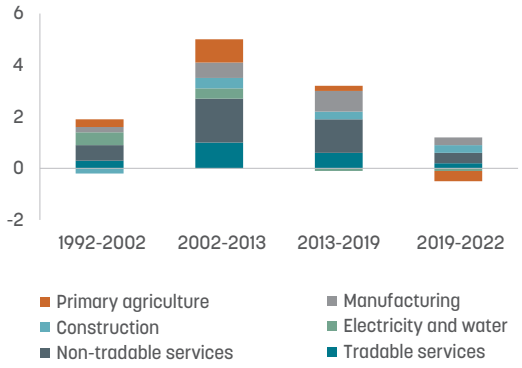
Average contribution to real GDP growth, percentage points



Source: Staff calculations using BCP

Figure 19. ...which supported growth in the non-tradable services sector.

Average contribution to real value added growth, percentage points



Source: Staff calculations using BCP.

The slowdown in growth since 2013 could thus be explained by external shocks that have adversely affected the export of commodities. Paraguay's overall output growth is highly correlated with the growth of exports, and hence with commodity 'boom and bust' cycles. From 2002-2013, a steady increase in commodity prices, including of soybeans, boosted the demand for tradables and non-tradables, leading to the growth of exports and private consumption as disposable incomes increased (Figure 18 and Figure 19). The real exchange rate appreciated from 2005 to 2014, but there is no conclusive evidence that Paraguay experienced 'Dutch Disease' (Box 3). As commodity prices normalized in 2013, the pace of

private consumption and exports decelerated, resulting in slower overall growth. Even though commodity prices picked up again recently, severe droughts in 2019 and again in late 2021 suppressed the volume of agriculture and hydropower exports, depressing growth.

Box 3. Has Paraguay suffered from Dutch Disease?

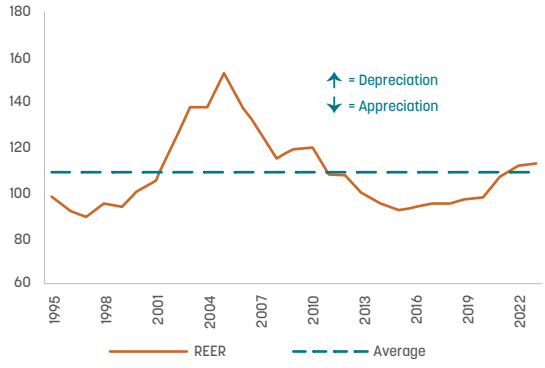
Natural resource abundance can be a blessing or a curse for growth. Commodity price booms can lead to windfalls, but these could be a 'mirage' if not accompanied by increases in output or productivity (De La Torre et al. 2016). Many resource-rich countries suffer from "Dutch Disease", i.e., a long-term appreciation of the real exchange rate that makes the manufacturing sector less competitive as resources (labor and capital) are drawn towards the commodity sector (Corden and Neary 1982).

A preliminary analysis shows that Paraguay does not seem to have suffered from Dutch Disease. First, the real effective exchange rate (REER) does not show a long-run tendency to appreciate. The REER indeed appreciated by 4 percent per annum on average from 2005 to 2015, coinciding with a 5.4 percent real increase in international soybean prices from 2002 to 2013; it subsequently began to converge towards the long-run average (Figure 20).

Second, the appreciation in the real exchange rate does not seem to have adversely affected (non-agriculture) manufacturing exports. Non-agriculture exports, driven by plastics, grew rapidly during the commodity boom period (Figure 21). This is supported by a multivariate regression using quarterly data, which indicates that there is no statistically significant relationship between variations in the REER and all sectors of non-agriculture manufacturing exports.

Figure 20. The REER appreciated during the commodity boom...

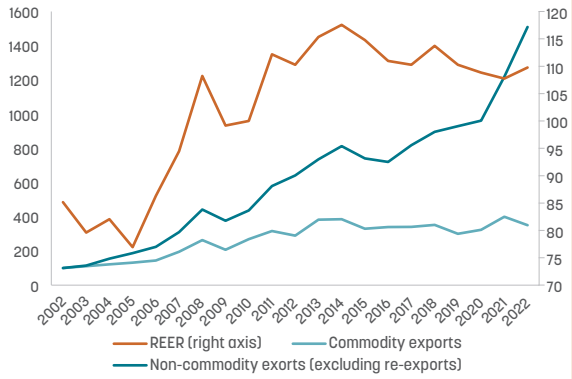
Real exchange rate index, 2010 = 100



Source: World Bank.

Figure 21. ...but did not depress non-commodity export growth.

Export growth index (2002 = 100);
REER index (2010 = 100; right axis)



Source: BCP and World Bank.

Why does Paraguay need to boost productivity growth?

Slower growth over the last decade can be explained by a historic deficit in investment and thus a more significant lack of total factor productivity (TFP) growth.[25] In the early 2000s,

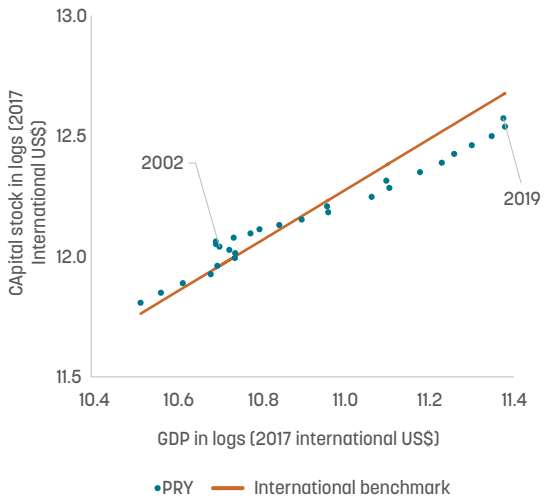
[25] A measure that embodies technological progress in the production process and the efficiency with which inputs (i.e., labor and capital) are utilized.

Paraguay was emerging from a period of political instability and recession that had left a large part of its existing capital stock underutilized. This was evident from the high capital-to-output ratio at the time (Figure 22), which was 12 percent higher than expected for its income level. As the political and economic environment stabilized, the utilization of existing capital stock improved and led to faster growth over 2002-2013.

Over this period, two-thirds of the gains in GDP were driven by TFP growth (Figure 23), but this likely reflected cyclical factors such as higher commodity prices rather than technological progress (see Box 4). Improvements in educational attainment[26] had also made workers more productive. By contrast, capital deepening (the capital per labor ratio) did not contribute to growth, as investment levels remained low. Public capital stock per capita[27] in fact fell 0.3 percent annually on average over 2002-2013, contrary to peers. Private capital stock per capita increased by 2.2 percent annually on average over the period, but at a slower pace than peers.[28]

Figure 22. The high capital-output ratio in 2002 indicated excess capacity in the economy, but in 2013 it had turned into scarcity

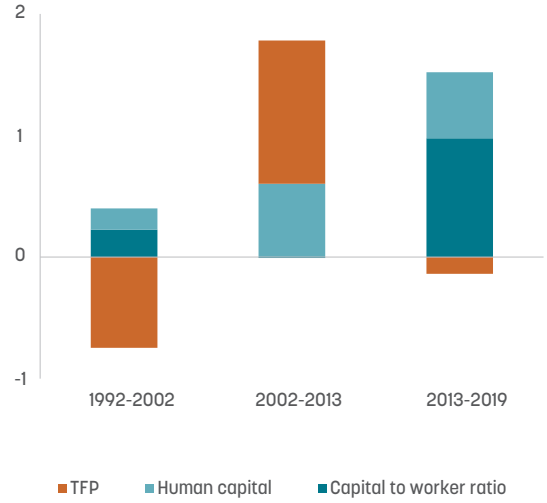
Y-axis: log of capital stock (in 2017 international USD)
X-axis: log of GDP (in 2017 international USD)



Source: PWT 10.0, staff calculations.

Figure 23. Better utilization of existing capital initially drove large TFP gains over 2002-2013

Contribution to growth in GDP, percentage points



Source: PWT 10.0, staff calculations.
Note: All factors measured on a per worker basis.

By 2013, the surplus of capital per worker that Paraguay had earlier enjoyed had turned into a shortage (Figure 22), as growth in employment had outpaced growth in investment. As a result, Paraguayan workers began to lose ground in terms of the amount of capital used in production

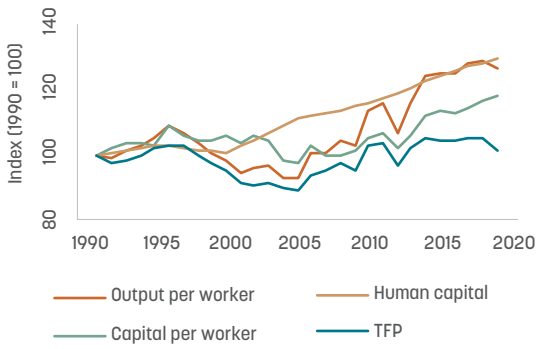
[26] Average years of schooling rose from 7.1 to 8.5 years over 2002-2013. Source: Barro-Lee 2018.
[27] The denominator (total population) uses INE data and projections based on the 2012 Census. The data from the 2022 Census was not available during the preparation of this report. This applies to all the per capita calculations in the report.
[28] Calculations from IMF 2022b.

relative to the average worker in high-income economies.[29] Over 2013-2019, both public and private capital stock accelerated at a rate on par with the rest of the region,[30] leading to an increase in the physical capital to worker ratio and an expansion of its contribution to growth.

However, TFP growth decelerated between 2013 and 2019 (Figure 23 and Figure 24) and its contribution turned negative over this period. This likely reflects both business cycle effects, i.e., lower global commodity prices (see Box 4), as well as the fact that the increase in investment did not contribute to greater technological adoption and hence to higher TFP growth.[31] In fact, according to the analysis of data from *Penn World Tables*, or PWT (Feenstra et al. 2015), 90 percent of the increase in fixed investment in Paraguay between 2013 and 2019 has been directed towards structures,[32] rather than machinery and transport equipment that workers can employ in production (Figure 25). Investment in ICT assets were also minimal, making no contribution to growth.[33]

Figure 24. Between 2013 and 2019, capital per worker has increased but TFP has decelerated...

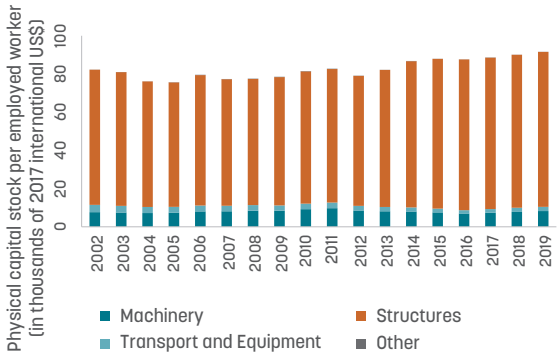
Index (1990 = 100)



Source: PWT 10.0 and INE, staff calculations

Figure 25. ...as fixed investment has mostly gone into structures rather than productive assets.

Physical capital stock per employed worker (in thousands of 2017 international USD)



Source: PWT 10.0, staff calculations

Box 4. Adjusting for the effect of commodity prices on factor utilization, total factor productivity growth has been low in Paraguay

Estimating TFP is especially tricky in countries such as Paraguay where detailed firm-level data is not available, as it is not possible to distinguish competition issues from the misallocation of resources (Cusolito and Maloney, 2018). To isolate TFP from cyclical effects, Aquino (2015) and Aviomoh (2023) make two adjustments: (i) labor and capital stock are adjusted by their levels of utilization, proxied respectively by the average years of schooling

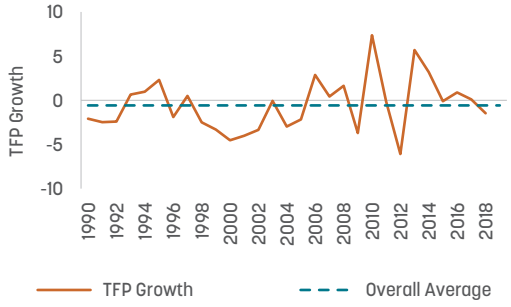
[29] From 2002-2019 the average capital per worker ratio for lower middle-income countries compared to high-income economies rose from 16 to 30 percent; for UMICs it rose from 9 to 12 percent. In Paraguay, it fell from 18 to 17 percent.
[30] Public and private capital stock per person grew 1.8 percent and 3.1 percent per annum over the period. Source: IMF 2022b.
[31] This feedback loop from the accumulation of capital to TFP is generally referred to as capital-embodied technological progress or investment technology growth and has been found to be a key driver of growth and structural change (Caunedo and Keller 2023; Pakko 2002; Greenwood et al. 1997).
[32] This spans residential and non-residential buildings. More disaggregated information is not publicly available, but consultations with the Central Bank validated this finding.
[33] Staff calculations using the Total Economy Database by the Conference Board.

and electricity consumption (Method 1); and (ii) capital stock is directly substituted with observable variables such as fixed capital formation, the depreciation rate, and the rental rate of capital (Method 2).

All results show the same pattern: Paraguay's productivity growth was very low in the 1990s, accelerated during the commodity boom over 2002-2013, and then decelerated over 2013-2019 (Figure 26). However, TFP's contribution to growth is much lower in the adjusted methods, with the direct substitution method even showing a negative TFP contribution to growth over 2013-2019 (Figure 27). This suggests that the acceleration in TFP growth captured in a conventional growth decomposition is not driven by technological progress, but by a combination of higher commodity prices and improvements in the utilization of existing capacity.

Figure 26. Conventional estimates of TFP growth for Paraguay indicate an acceleration over 2002-2013, followed by a deceleration

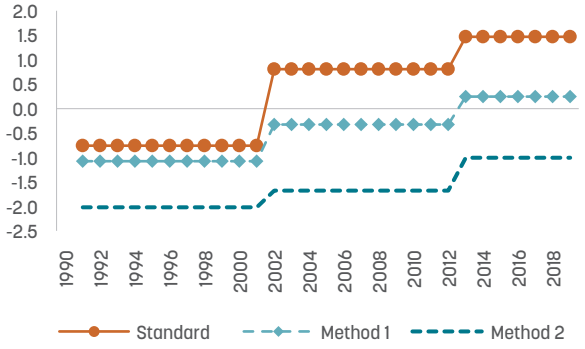
Year-on-year growth of TFP, percent



Source: Aviomoh (2023) using data from WDI and PWT 10.0 and the Global Productivity database.

Figure 27. Adjusting for factor utilization, TFP's contribution to overall growth in Paraguay is even lower

Year-on-year growth, percent, period average



Source: Aviomoh (2023) using data from WDI and PWT 10.0 and the Global Productivity database.

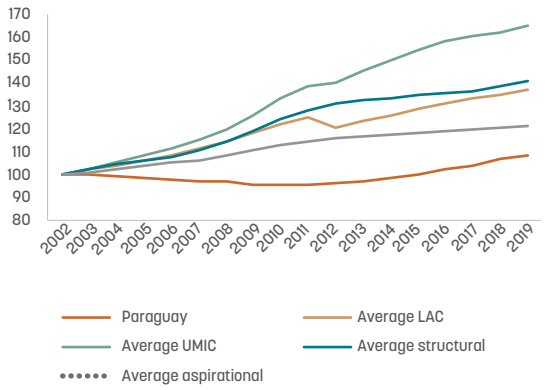
Institutional challenges could be a factor that explains the low levels of private and foreign direct investment in Paraguay. As previously mentioned, Paraguay's FDI has hovered at a third of its peers (Figure 4), despite an open investment regime and generous investment incentives (World Bank 2022b). One possible explanation is the perception that Paraguay faces institutional challenges such as organized crime, legal security, protection of intellectual property rights, and money laundering (Bertelsmann Shiftung 2022). According to the World Justice Project (2023), Paraguay is considered less effective than most countries in the region in aspects such as civil and criminal justice and the application of law, despite being more effective in other aspects of the rule of law (such as open government, order, and security). Indeed, Sierra et al. (2018) estimated that Paraguay is 25 percent less likely to be chosen as a host country for FDI compared to similar countries that are perceived to have better institutions, despite a more stable macroeconomic environment. Although Paraguay's anti-money laundering and combatting the financing of terrorism (AML/CFT) regime has significantly improved, other areas including oversight, preventative measures, and financial

intelligence still require improvements (GAFILAT 2022). The government, through SEPRELAD, has taken various actions to align with AML/CFT standards, including the implementation of security policies, data protection, and improvements in the capacity of its personnel, as well as an action plan to address weaknesses identified by GAFILAT.

The level of public investment has a direct impact on private investment. Public investment can 'crowd-in' stimulate private investment in emerging economies by affecting demand, increasing investor confidence, and providing basic infrastructure (Kose et al. 2017). Indeed, in Paraguay, the fiscal multiplier is much higher for public capital spending rather than current spending (David 2017). Nonetheless, Paraguay's public investment only averaged 3.5 percent of GDP over 2002-2019, 34-46 percent lower than the average UMIC, LAC, and structural peer (Figure 28). While public investment had increased over 2019-2022, it is projected to fall again as a share of GDP over the medium term as the government strives to reach the legally mandated fiscal deficit target of 1.5 percent of GDP. Public investment tends to fall during such consolidation episodes due to the high rigidity of the budget,[34] which limits options for cutting current spending, and aversion to raising tax policy rates.

Figure 28. Public investment has increased, but at a slower pace than peers

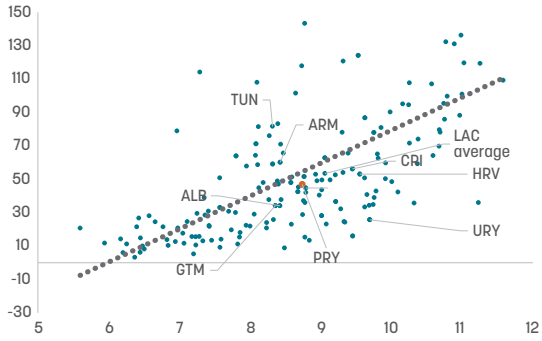
Index of public capital stock per capita (2002 = 100)



Source: IMF (2022b), staff calculations.

Figure 29. Credit to the private sector is lower than all peers

Y-axis: Domestic credit to private sector, percent of GDP;
X-axis: Log of GDP per capita in constant 2017 USD



Source: WDI, staff calculations.

Developing financial markets could increase the amount of credit available for investment. While credit to the private sector has grown to 51.3 percent of GDP in Paraguay in 2022,[35] it remains lower than the median for regional peers and UMICs (Figure 29) and is concentrated in the banking sector. Capital markets are also small, with a trading volume around USD 3.4 billion in 2021, and insurance penetration is limited. As a result, firms cite access to finance as one of the top constraints in expanding their businesses in Paraguay (see Chapter 2). The fragmented pension system also does not sufficiently channel national savings towards

[34] About 60 percent of Paraguay's budget is spent on public wages, social transfers and interest payments.
[35] Source: WDI using IMF data. According to the IMF (2024), this includes the largest 20 cooperatives.

investments (Apella y Mont 2024, IMF 2017), although at 23 percent of GDP, Paraguay's gross national savings rate is in fact higher than peers. To this end, it is promising that the government enacted the Superintendency of Retirement and Pensions at the end of 2023.

How have growth dynamics constrained the creation of good quality jobs?

As a result of slower growth since 2013, the creation of 'good' jobs (as defined by formality and average labor income levels) has slowed and real labor incomes have stagnated. Between 2002 and 2013, the Paraguayan economy created approximately 73,000 jobs annually on average in net terms[36] — enough to absorb the large increase in the working-age population[37] without higher inactivity or unemployment rates.[38] During this period, average labor income rose by 1.5 percent per annum in real terms, driving poverty reduction. Between 2013 and 2019, however, the average yearly (net) job creation rate halved compared to the previous period, and average labor income fell by 1 percent per annum. It fell further by 2 percent per annum over 2019-2022. Controlling for cohort and age effects, real income has stagnated for Paraguayans born after 1993 (Rojas and Yoong 2022).

Three factors explain why the creation of good jobs may have slowed:

i. **The public sector has created fewer formal jobs, and the private sector has not generated enough formal jobs to absorb the growth of the working age population.** As previously noted, the pace of formal job creation slowed between the 'catch-up' and 'slowdown' periods of growth. This reflects two facts. First, the public sector created 82 percent fewer (net) jobs over 2013-2021 compared to 2003-2013, the result of efforts to contain the rise in public payrolls and consistent with fiscal consolidation. An econometric analysis using data from the household surveys indicates that the rate of formalization of workers in Paraguay is positively correlated with the public sector and education (Rojas and Yoong 2022). Second, the private sector created more (net) jobs between 2013-2021 compared to 2003-2013, but this was not sufficient to drive a greater increase in formality.

ii. **The pace of transition towards good jobs in the manufacturing and services sectors has slowed.** From 2003-2013, the movement of workers away from primary agriculture into sectors that were initially more productive drove increases in average labor income (Figure 30).[39] Most net job creation took place in non-tradable services and construction, rather than manufacturing.[40] Overall, these sectors created more formal waged jobs and more job opportunities requiring mid- and high-level skills compared to primary agriculture, leading to a wage premium.[41] Although this structural transformation has

[36] Source: Staff calculations using the Household Survey data.
[37] The working-age population increased faster in Paraguay than in the average LAC and UMIC country.
[38] The inactivity rate remained relatively stable at 28-32 percent, while the unemployment rate fluctuated only slightly between 5.5 and 7 percent.
[39] In 2003, labor productivity was about 2.5 times as productive in the non-tradable services and 4.2 times in construction sectors than in primary agriculture, and 6 times more productive in tradable services sectors.
[40] Although manufacturing was 7 times more productive than primary agriculture in 2003, it created fewer jobs.
[41] This result holds both when only wage workers are considered, as well as all workers.

continued, it has slowed, as indicated by the flattening slope of the trend line in Figure 31. Only two sectors — construction and hotels & restaurants — created more jobs in the last decade relative to the previous one. Tradable services such as financial and business services — which pay higher wages, tend to generate more formal employment, and have high value added per worker compared to other sectors — created 50 percent fewer jobs in the most recent period.

iii. **Returns to education and formalization are falling.** Returns from an additional year of schooling fell from 9.2 percent in the period 2002-2013 to 4.6 percent in the period 2013-2019 (Rojas and Yoong 2022).[42] Similarly, the returns to formality more than halved between these two periods.[43] This is consistent with both the expansion in the supply of more skilled workers, as well as weaker labor demand.

Figure 30. Workers have been moving out of primary agriculture into more productive sectors...
Y-axis: Initial labor productivity in 2003; X-axis: Change in employment share over 2003-2013

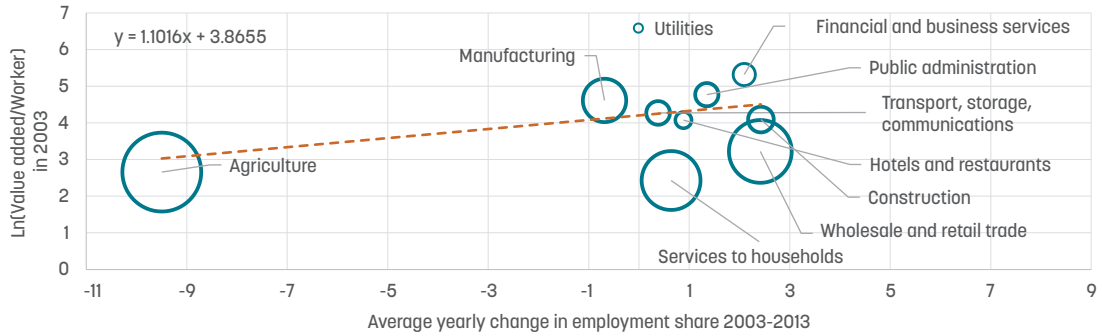
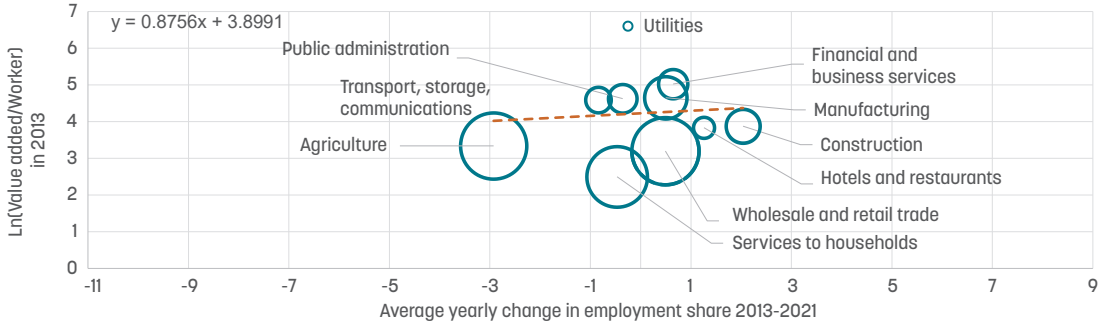


Figure 31. ...but this process has slowed in the last decade.
Y-axis: Initial labor productivity in 2013; X-axis: Change in employment share over 2013-2021



Source: Staff calculations based on data from EPH.
Note: Size of the bubbles represent the share of the sector in initial total employment.

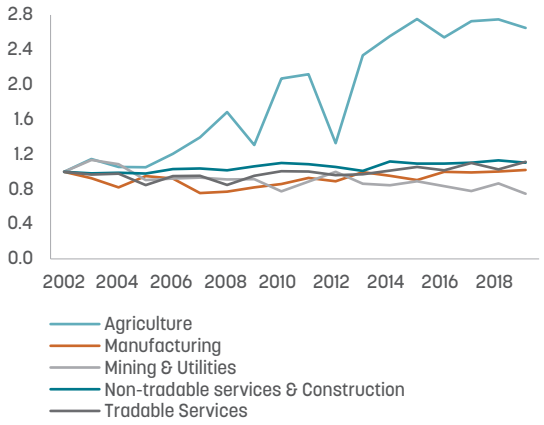
[42] After controlling for year and age dummies, formality, sector, gender, occupation, and region. The pseudo panel regression is run in first difference using one lag of the main variables as instruments to control for measurement error in cohort averages. See Rojas and Yoong (2022) for more details.
[43] After controlling for year and age dummies, sector, years of schooling, gender, occupation, and region. The sample only includes wage workers in non-agricultural sectors.

The slowdown in the creation of good jobs has brought to the fore a key weakness in Paraguay's current growth model: a lack of labor productivity growth in sectors outside primary agriculture. Labor productivity (as proxied by real value added per employed worker) in Paraguay's primary agriculture sector has almost tripled since 2002, reflecting technological improvements especially in soybean production. In the manufacturing and services sectors, however, labor productivity has barely risen in comparison to the primary sector (Figure 32).

This pattern contrasts with that of other UMICs, which mostly experienced higher productivity growth in sectors outside primary agriculture (Figure 33) — a key driver of the structural transformation process. In Paraguay's case, labor demand outside of agriculture during the catch-up years (2002-2013) did not come from investments into new productive capacities in non-agricultural sectors, but instead from a better utilization of existing capacity. With such catch-up gains now exhausted, the decades-long lack of investment and productivity growth in sectors outside agriculture is constraining the creation of good jobs.

Figure 32. In Paraguay, agriculture labor productivity growth has outpaced manufacturing and tradable services...

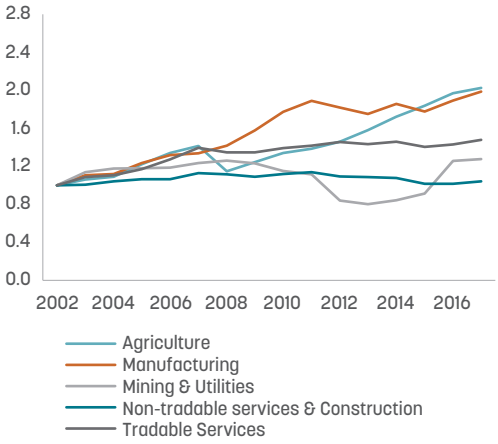
Index of real sector value added per worker in Paraguay, 2002-2019 (2017 constant prices; 2002 = 1)



Source: WDI, staff calculations.

Figure 33. ...contrary to the pattern seen in the average upper middle-income country.

Index of average real sector value added per worker in UMICs, 2002-2017 weighted average (2017 constant prices; 2002 = 1)



Source: WDI, staff calculations.

How can Paraguay boost the productivity, resilience, and sustainability of growth?

If Paraguay wants to become a high-income country, it is necessary to accelerate structural reforms to boost productivity. In a baseline scenario where labor, capital, and TFP continue to grow at their 2015-2019 averages, World Bank simulations using a Solow long-term growth model[44]

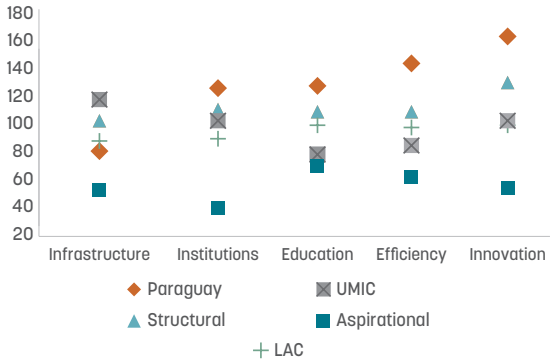
[44] See Loayza and Pennings (2022) for more information about the model (TFP extension). The Solow model has several limitations. For example, rates of participation are intrinsically tied to labor market dynamics and cannot be completely captured by the model. Moreover, the effects of investment assume declining returns inherent to the Solow framework and neoclassical growth theory. It is important to recognize that other growth models can arrive at different results.

indicate that Paraguay would continue to grow by 1.8 percent per year on average. This pace would not be fast enough to catch up with more advanced economies such as the United States within the century.[45] In 60 years, it is estimated that Paraguay's income per capita would still only be a quarter of the United States'. Paraguay could accelerate the growth and convergence of incomes with the US by increasing female labor force participation rates from 61 to 75 percent,[46] sustaining a higher level of fixed investment at 25 percent of GDP,[47] and especially increasing annual TFP growth to 0.5 percent per annum.[48] It is estimated that the latter would boost per capita income growth from 1.8 to 2.4 percent per annum on average over the next 20 years, enabling Paraguay to reach almost 40 percent of the US' per capita income in 60 years' time.

Paraguay has an opportunity to boost TFP growth if it improves its performance on key determinants of productivity. Paraguay currently ranks much lower — 121 out of 192 countries — on a composite TFP index developed by Kim y Loayza (2019) compared to the median UMIC and LAC country, which rank 89th and 92nd respectively. This is due to its dismal performance on five key determinants of productivity growth: innovation, market efficiency,[49] education, the quality of institutions, and infrastructure (Figure 34). Improving its performance on these indicators could help Paraguay to boost TFP growth.

Figure 34. Paraguay ranks poorly on all determinants of productivity growth, especially on innovation

Ranking on the productivity index (0 = best, 192 = worst)



Source: Staff calculations following methodology in Kim and Loayza (2019).

The biggest boost to productivity would come from improving the quality of public institutions (Box 5), followed by improvements in efficiency and innovation. Paraguay ranked only 97th out of 141 countries on the 2019 World Economic Forum (WEF) Global Competitiveness Index, behind all peers except Guatemala. As discussed in Chapter 2 and 3, barriers to competition and to doing business may be dragging down efficiency. Similarly, Paraguay ranks 91 out of 132 countries on the Global Innovation Index (WIPO 2022) — again, only ahead of Guatemala among peers. This is partly a function of low spending on research and development (0.1 percent of GDP in 2018) and of fewer researchers and technicians per capita than most of its peers. Finally, closing the gaps with other UMICs on educational attainment and in connectivity would yield productivity gains. The quality of road infrastructure, airport connectivity, and the efficiency of air transport services are particularly low, as evidenced by Paraguay's dismal ranking on these indicators in the 2019 WEF index. The government recognizes the need to

[45] The USA simulation also assumes that the main variables remain at their 2015-2019 averages.
[46] Equivalent to the 75th percentile of the average female labor force participation distribution for high-income countries between 2015-2019, and also the 95th percentile across upper middle-income countries.
[47] This would be on par with the high-income and UMIC averages, and with selected peers.
[48] Following Aviomoh (2023), this is the average TFP growth over 2003-2014, when Paraguay's per capita income was catching up with the United States, adjusted for capital utilization.
[49] Defined as the efficient allocation of resources (e.g. labor, capital and materials) across firms and sectors.

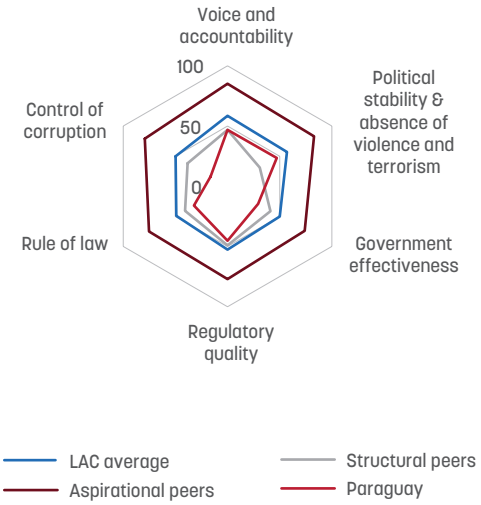
improve the efficiency of public spending and has taken recent steps to achieve this goal through the unification of various entities,[50] the implementation of a new public contracts law, and proposals for new laws to regulate the state's administrative organization and strengthen the capacity of the civil service to fulfill institutional objectives.

Box 5. A capable state is fundamental to spur Paraguay's transformation and growth

The quality of Paraguay's institutions has shown many significant improvements in the last decades. Nonetheless, Paraguay still ranks in the lowest twentieth percentile on all dimensions measured by the Worldwide Governance Indicators (Kaufmann and Kraay, 2023): control of corruption, government effectiveness, voice and accountability, the rule of law, and political stability/absence of violence and terrorism. Paraguay sits above its structural peers in this last indicator, and close to its peers in government effectiveness, but remains behind on the other indicators, especially regarding control of corruption (Figure 35). On Transparency International's 2023 Corruption Perceptions Index (GI-TOC 2023), Paraguay ranks 136 out of 180 countries (0 = least corrupt, 180 = most corrupt), behind only Venezuela in the region. The public perception of high levels of corruption can compromise the legitimacy of public institutions and undermine the social contract between the state and citizens. Indeed, in March and April 2023, 82.7 percent of Paraguayans surveyed by Latinobarómetro had little or no trust in the government (Figure 36).

Figure 35. Paraguay remains behind on indicators of government effectiveness, control of corruption, and rule of law

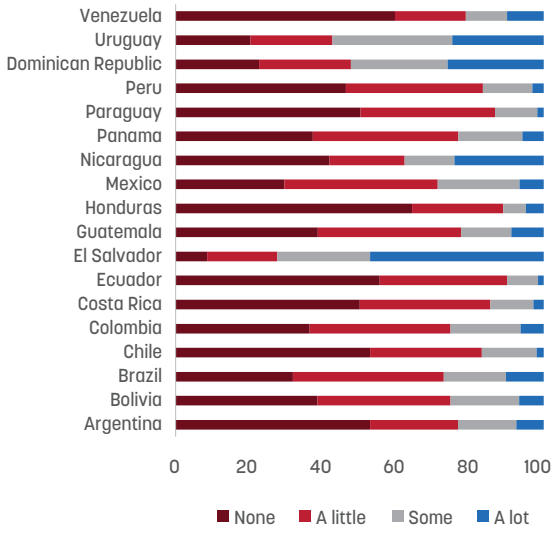
Score on Worldwide Governance Indicators index (0 = worst, 100 = best)



Source: Kaufmann and Kraay 2023.

Figure 36. Trust in government is low throughout the region, including in Paraguay

Share of respondents according to their trust in government, percent of total



Source: Latinobarometro 2023.

[50] For example, in August 2023 various government organisms were integrated under the new Ministry of Economy and Finance, in addition to the unification of tax collection and customs institutions.

Addressing these challenges requires action on many fronts, including: (i) improve institutional mechanisms for citizens and civil society organizations to actively engage in the policy-making process; (ii) reform the judiciary to increase trust in the rule of law and ensure equal treatment to all citizens and all private organizations; (iii) enhance business environment regulations to increase the efficiency and contestability of markets (see Chapter 2 of this report); and (iv) strengthen anti-corruption policies. In November 2023, the government launched its National Strategy to Counter Corruption. Among other aspects, the strategy involves updating the legal framework of the Law of Integrity, Transparency and Prevention of Corruption, the implementation of new measures to improve integrity and public and private transparency, and improvements to the penitentiary and police system.

Though challenging to achieve, diversifying its export basket will help Paraguay build resilience to external shocks. While natural resources are and will likely remain Paraguay's comparative advantage for the foreseeable future, its ability to buffer against external shocks would be greatly strengthened if exports diversify more quickly away from soy, beef, and hydropower. There are several ways for this to happen: (i) Paraguay can develop new varieties of existing products (e.g. increasing varieties in meat and dairy products or exporting other food items), (ii) upgrade the quality and technological content of its exports, or (iii) export new products and services altogether. Various analyses show that Paraguay has the potential to export more complex products such as chemicals, medicaments, medical instruments, furniture, vaccines, agriculture machinery, and bioplastics/biopharmaceutical products (Hartmann et al 2019, Che 2020, Ruppert-Bulmer and Cuomo 2018). Similarly, Paraguay also has the potential to increase the contributions of transport and tourism services to export growth (see Chapter 3). Nonetheless, achieving these transformations will require significant investments in human capital and infrastructure.

Global experience indicates that **horizontal or cross-cutting policies that benefit *all* sectors** would help Paraguay to achieve its export diversification goals (Lederman and Maloney 2012). These include:

- *Strengthening the appropriate incentive framework for trade, competition, and investment.* Key steps to include: (i) reviewing trade policies to remove any anti-export biases, (ii) streamlining the requirements for import licenses and/or eliminating trade surcharges, fees and other non-tariff measures (see Chapter 2), (iii) ensuring effective competition in product markets and in key services such as transportation, energy, and communications (see Chapter 2 and Chapter 3), and (iv) strengthening the framework for investment promotion and policy. As part of the latter, Paraguay could review the effectiveness of its tax incentives and exemptions in creating jobs and contributing to growth. A previous assessment had found that Paraguay's tax incentive schemes may be producing distortions as they had placed a considerably lower burden on investments in agriculture, automobiles, and free economic zones than on other sectors (World Bank 2018b). Paraguay could reassess whether this is still the case, and more

importantly, whether these incentives are achieving their strategic objectives of creating good jobs and contributing to development, as stated by law 5542/15. The government has committed to review fiscal spending in 2024 (IMF 2024).

- *Spending more and better on human capital and connective infrastructure.* Addressing the gaps in education and basic public services such as health and education are critical to enhancing Paraguay's capabilities in new markets and in encouraging entrepreneurs to explore new business opportunities. Given that Paraguay is landlocked, improvements in digital connectivity are also critical to support the development of tradable services (see Box 6 and Chapter 3).
- *Using information to better target specific market, policy, and institutional failures.* In Paraguay, the lack of knowledge and high costs of quality validation, especially in the agriculture sector, tends to be a barrier to scaling up production of more niche, organic products (World Bank 2022b; see Chapter 4). Similarly, information asymmetries such as lack of knowledge of overseas market standards are a key factor behind the comparatively low survival rate of new export flows (see Chapter 2).

Box 6. To what extent has being landlocked affected Paraguay's development?

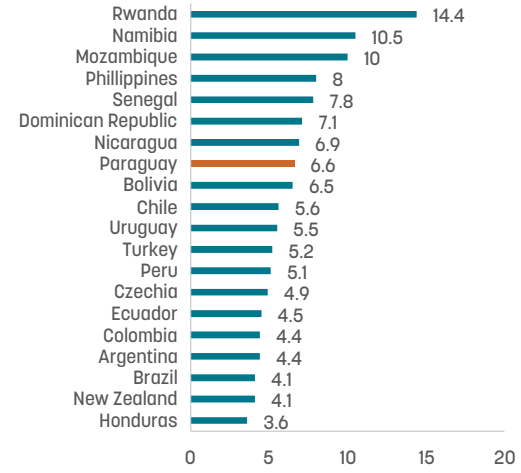
Landlocked developing countries (LDCs) tend to face more difficulties in accessing markets than coastal countries, leading them to trade less and grow slower (Arvis et al. 2010). This not only reflects higher transportation costs from having to depend on neighboring countries to export and import, but also the low reliability and predictability of their logistics systems (Arvis et al. 2010).

OECD estimates (Wegner and Miao 2022) indicate that Paraguay indeed faces higher transport and insurance costs than most LAC countries, but not as high as several coastal countries such as the Dominican Republic and the Philippines (Figure 37). This could reflect the fact that Paraguay is a very special type of LDC: it has two major waterways which carry 92 percent of its export volumes and 79 percent of import volumes, or about 22 million tons of freight annually. In addition, most of Paraguay's soybean and hydropower exports go directly to neighboring Argentina and Brazil. Nonetheless, Paraguay's dependence on the waterways makes it vulnerable to its neighbors' exogenous policy decisions. In January 2023, Argentina began to levy a tax on the passage of international cargo through its section of the waterway.

Improvements in connectivity, logistics, and trade facilitation could help Paraguay mitigate the impact of being landlocked. While Paraguay's performance on the World Bank Logistics Performance Index has improved to a level on par with most peers (Figure 38) and better than most LDCs, it still lags aspirational peers on the efficiency of customs clearance and the competence and quality of logistics services. Strengthening the customs code and streamlining the associated fees and charges, especially related to licensing, could help Paraguay reduce trade costs. In addition, Paraguay could better leverage digital technologies, promote more effective competition policy, and remove restrictions in the services sector to overcome the barriers of physical distance from markets.

Figure 37. Paraguay faces higher trade costs than some coastal countries

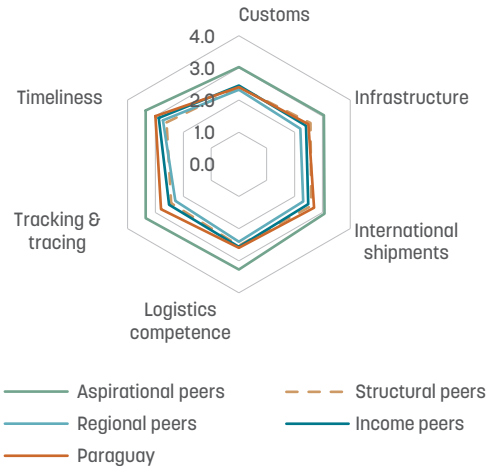
CIF-FOB weighted average margins, percent



Source: Wegner and Miao 2022.

Figure 38. Paraguay performs on par with the region on logistics capacity, but there is room to improve

Logistics Performance Index score in 2023



Source: World Bank 2023a.

Given that economic diversification will not happen overnight, in the meantime Paraguay needs to build resilience by strengthening existing buffers. Continuing to secure Paraguay's hard-won macroeconomic and fiscal stability is a necessary, even if insufficient condition to achieve faster, inclusive, and more sustainable growth. Current macroeconomic and fiscal policies can thus be strengthened to build Paraguay's ability to withstand external shocks. The current fiscal rule could be reviewed to ensure that it provides adequate space to sustain higher levels of public investment,[51] and strengthen its governance through the establishment of an independent fiscal council that assesses when the escape clause could be legitimately triggered. Paraguay could also strengthen accountability, transparency, monitoring, and audit mechanisms related to fiscal policies, and consider establishing a stabilization fund.

Deepening the financial market would also help mitigate the impact of volatility arising from Paraguay's high dependence on natural resources. Developing the domestic debt market would support greater resilience by increasing liquidity in the system for households and firms during times of need, and by reducing exposure to exchange rate shocks. Pension funds could be invested to reduce exposure to international interest rate shocks and unlock more climate financing. Moreover, a more robust disaster or agriculture risk financing strategy would improve farmers' abilities to transfer risk (see Chapter 4). This could include the use of sovereign bonds with pay-off structures associated with the occurrence of certain shocks, e.g., catastrophic bonds or other contingent credit lines. To that end, Paraguay's ongoing efforts to identify, quantify and analyze fiscal risks are critical to mitigation efforts through appropriate policies.

[51] At the end of 2020, a revision of legislation on fiscal responsibility was presented to Congress, but it did not advance due to the pandemic.

Paraguay published its first statement of fiscal risks in 2023, that includes an analysis of climate shocks, and is taking measures to integrate climate change in the financial system and in the management of public investment.[52]

Finally, Paraguay could take decisive steps to improve the sustainability of the current growth model by getting closer to the efficiency frontier of production. Like many countries, Paraguay could achieve the 'win-win' outcome of increasing agriculture output while reducing carbon emissions in three ways: reallocating resources towards more productive activities, changing the composition of what is produced, and improving the efficiency of resource use (Damania et al. 2023). This could involve, for example, reallocating land used for cattle ranching, which carries a high environmental footprint, to arable agriculture or producing environmental services. Similarly, in the energy sector, Paraguay stands to gain more from using its surplus of hydropower domestically to gradually decarbonize industry and transport, rather than exporting it to Brazil at below-market prices. These options are discussed in more detail in the Country Climate and Development Report for Paraguay (World Bank 2024a).

To incentivize these shifts to occur, Paraguay would need to address simultaneous policy and institutional gaps. To accelerate the development of sustainable forestry, for example, Paraguay would need to strengthen enforcement of current forest laws and consider tightening their provisions, ensure a level playing field in access to finance for forestry, and institute a comprehensive national forest certification standard and timber traceability system. Paraguay could also reallocate resources from lower to higher value uses within a sector (e.g., producing environmental services such as watershed production and biodiversity) and assess whether farmers, especially smallholders, have the knowledge, financing, and technologies to shift toward more sustainable intensification of land use. Targeted investments in infrastructure such as irrigation and transportation, could also yield significant benefits for agricultural intensification, especially in the Western region (see Chapter 4).

Productivity
Improve the quality of public institutions, market efficiency, innovation, infrastructure, and education
Encourage the creation and expansion of formal firms to create more and better jobs (see Chapter 2)
Resilience
Strengthen fiscal buffers and deepen the financial market
Gradually diversify exports (see Chapter 3)
Strengthen the incentive framework for trade, competition, and investment
Invest more and better in human capital and infrastructure
Use information to better target specific market, policy, and institutional failures
Sustainability
Get closer to the efficient frontier of production by reallocating resources towards more productive activities and improving the efficiency of resource use (see Chapter 4)
Address policy and institutional gaps that prevent a shift towards more sustainable agriculture and forestry

[52] For example, the government has committed to incorporate climate factors in public investment projects, publish a green taxonomy aligned with Paraguay's NDCs to mobilize financial resources toward strategic sectors, and incorporate risks related to climate in its guidelines for the management of financial risks (IMF 2024).

Annex 1 — Selection of comparator countries

To understand a country's progression and to identify opportunities and obstacles for growth, placing its growth and development outcomes in context is crucial. Typically, Paraguay's performance is compared to the average for the Latin America and the Caribbean region. However, considering the vast heterogeneity of the region, the CEM also compares Paraguay's performance to upper middle-income countries, a set of 'structural' peers and a set of 'aspirational' peers.

Structural peers

Similar to World Bank (2018a), structural peers were determined according to the following criteria:[53]

i. Total population being between one third and two and a half times that of Paraguay in 2020;

ii. GNI per capita in constant 2017 international dollars being +/- 30% of Paraguay's value;

iii. General government expenditure as percent of GDP being +/- one standard deviation of the expected value given each country's GNI per capita (in constant 2015 USD);

iv. Share of rural population in total population: +/- 12 percentage points of Paraguay's share;

v. Share of the working-age population: +/- 12 percentage points of Paraguay's share;

vi. Population density below half the mean of all country-level population densities; and

vii. Total natural resources rents (as a percentage of GDP): +/- one percentage point away from Paraguay's share.

For the purposes of this report, Paraguay's structural peers are defined as: Albania, Armenia, Guatemala, and Tunisia.

Aspirational peers

Aspirational comparators are countries with structural conditions similar to Paraguay, but have evolved and managed to reach higher per capita income levels. The same filters on total population and government expenditures as above were applied. The list of countries was then restricted to those that had a per capita income of at least 1.5 times higher than that of Paraguay's in 2015-2019, but no greater than 3.5 times higher in the period 1995-1999. These countries also have similar population density and natural resource rents.

Paraguay's aspirational peers are therefore defined as: Costa Rica, Uruguay, Croatia, and New Zealand.

[53] Excluding total population, these indicators were calculated as averages for the period 2015-2019.

Annex 2 — Determinants of total factor productivity growth

Productivity is key to sustained growth in the long term. Given its importance, it is paramount to analyze how different policy levers can help to boost productivity. For this purpose, the "Total Factor Productivity Extension" to the World Bank Long-Term Growth model (see Loayza and Pennings 2022) was developed in Kim and Loayza (2019). The extension provides a quantitative link from drivers of productivity to its growth, and thus enables simulations for increasing productivity.

Kim and Loayza (2019) perform an extensive review of the literature on determinants of TFP and overall economic growth and classify these into five categories: innovation, education, efficiency, infrastructure, and institutions. An index is created for each category and the subindices are subsequently combined into a composite overall index using factor analysis. The authors then link TFP growth to the (5-year lagged) overall index through a regression exercise that also controls for (a 5-year lagged) TFP, country, and year fixed effects.

Determinant	Indicators
Innovation	R&D expenditure as share of GDP, the number of patents per 100 people, and the number of scientific and technological journal articles per 100 people.
Education	Government expenditure on education as share of GDP; secondary and tertiary attainment rates (as percent of population aged 25 or older), and PISA scores.
Efficiency	Scores relating to output markets, financial markets (i.e. IMF financial development index), and labor market indicators (minimum wage as percent of value added per worker, severance pay as weeks of salary, and the share of women in nonagricultural sectors).
Infrastructure	Number of fixed telephone and mobile subscriptions (per 100 people), electricity supply (kW/100 people), paved road (km/100 people), access to improved water source (as percent of population), and access to improved sanitation facilities (as percent of population).
Institutions	Normalized scores for indices measuring voice and accountability, control of corruption, government effectiveness, political stability, regulatory quality, and the rule of law.

Source: Kim and Loayza (2019)

Chapter 2 —
Productivity and informality: two sides of the same coin

Key messages

- Productivity and informality of firms are two intertwined challenges that curb the pace and inclusiveness of Paraguay's economic growth.
- Formal (registered) firms[54] in Paraguay are less productive than those in the rest of the LAC region, which limits their ability to generate more well-paying jobs with adequate worker protection. Nonetheless, on average they are more productive, create more value, and pay higher wages than informal (unregistered) firms.
- Access to finance at the start-up stage is a critical determinant of formality.
- Public policies to improve the entry and exit of firms, strengthen firm capabilities, expand access to markets and access to finance can boost the productivity of the private sector — and hence the creation of more 'good' jobs, but they need to be anchored in a solid institutional framework and better-informed by more regular collection of data on firms.

Introduction

Paraguay faces the challenge of stimulating productivity growth and promoting the formalization of both firms and workers. The preceding chapter showed that, despite important gains over the past three decades, growth has slowed since 2013. This chapter takes a closer look at factors that influence the productivity of the private sector, which is the key driver of economic growth. Moreover, it argues that productivity and informality are two intertwined challenges that prevent the Paraguayan economy from growing faster and from creating more and better jobs.

Firm-level data is currently very limited in Paraguay in comparison to other countries in the region,[55] constraining productivity analysis. This chapter analyzes the results of two World Bank surveys of firms operating in the manufacturing and services sectors: (i) the World Bank Enterprise Survey (WBES) of small, medium and large firms, conducted in 2017, and (ii) a new INE-World Bank survey of micro and small firms conducted in March 2023 (Box 7). However, these surveys do not have the samples necessary to measure TFP, a more accurate measure of firm efficiency. As a result, this chapter analysis uses *labor productivity*, defined as value added per worker.[56]

[54] Registered with the National Directorate of Tax Revenues (DNIT).

[55] For example, ECLAC aggregates historical firm-level data for Brazil, Chile, Colombia, Ecuador, Mexico, Peru, Uruguay, and the Dominican Republic. Costa Rica, Panama, and Argentina also regularly conduct firm-level surveys.

[56] Labor productivity gaps across firms may reflect differences in the use of capital and other inputs in the production process, and not intrinsic gaps in business efficiency. Ideally, one would like to take into account the use of all inputs that go into the production process, not only labor inputs, and use more encompassing measures of firm efficiency such as *total factor productivity* or *multifactor productivity*, but such data is not available for Paraguay. In addition, the lack of data on the price of firms' final output limits the analysis here to the use of sales to measure value added, which does not take into consideration other aspects that affect a firm's revenue, such as the lack of market competition or differences in product quality.

The chapter is structured as follows. Part 1 compares formal (registered) and informal (unregistered) firms in Paraguay, benchmarking its performance to peers where the data permits. Part 2 discusses the factors correlated with formal and more productive firms, and the most binding constraints to (formal) firm expansion and productivity growth along three channels: (i) the allocation of resources, (ii) the expansion of individual firm capabilities, and (iii) the creation of new and more productive firms that replace less productive ones. The chapter concludes with recommendations on how Paraguay can improve firm-level productivity in all channels, and in the process create better jobs for Paraguayans — defined by higher wages, pensions, and health benefits.

Box 7. There is a dearth of structured information on firms in Paraguay

Unlike many LAC and upper middle-income countries, Paraguay has not conducted regular censuses and surveys of firms. The last economic census for Paraguay took place in 2011. A follow-up survey on firms drawn from the census, covering the manufacturing, commerce, and non-financial services sectors, was conducted in 2014. Both the census and the follow-up survey suffered from quality issues such as missing information on capital assets and age, and relatively low response rates for micro and small firms (World Bank 2017b). The follow-up survey only covered formal (registered) firms.

To address some of these gaps, the World Bank collaborated with Paraguay's national statistics agency or *Instituto Nacional de Estadística (INE)* to pilot a survey of formal and informal firms, focusing on micro and small firms. The INE-WB Micro and Small Enterprises survey ("INE-WB survey") was conducted in March 2023 in two regions, Asunción and Central, where nearly half of all micro and small firms in the country are located (MIC 2023). While not representative at the national level, the survey captured a representative sample of micro (1-10 workers) and small firms (11-30 workers)[57] in the following sectors: manufacturing of clothes or shoes; manufacturing of metallic products; sales of clothes or household items; transport services; construction; vehicle repair; and professional services (including legal, accounting, ICT, creative services). Together, these sectors make up 64 percent of all formal micro and small firms in the two regions.

A thousand firms (400 informal and 600 formal) were interviewed between March 1 to 30, 2023.[58] Formal firms are defined as those that are registered with the tax authorities, i.e. they possess a *Registro Unico de Contribuyente* (RUC) or tax ID number. For formal firms, the sample frame used the 2011 economic census and the updated business registry maintained by INE, and interviews were conducted via telephone. For informal firms, pooled household surveys (*Encuesta Permanente Continua de Hogares*), which capture household and other informal establishments, were used as a sample frame. Face-to-face interviews were conducted with all informal firms. The survey covered topics such as the reasons for starting a business, managerial practices, growth perspectives, and obstacles to expansion.

[57] For the purpose of the analysis presented in this chapter, three strata of firm size are considered: those with two or fewer employees (630 in total); firms with between 3 and 4 employees (197 in total); and those with at least 5 employees (115 in total). Given the characteristics of the INE-WB survey (2023), the stratification utilized permits us to realize a more detailed analysis. However, it is important to mention that it differs from the definitions used by INE (microenterprises: 1 to 10 workers; small firms: 11 to 30 workers).

[58] The analysis in this chapter only uses 942 observations in total (550 formal and 392 informal), as it focuses exclusively on respondents who are both the owners and founders of their firms.

This chapter also uses data from the World Bank Enterprise Survey (WBES; World Bank 2017c), which was conducted in Paraguay in 2017.[59] The survey covered 364 formal firms with five or more workers, i.e., small, medium, and large firms. Most of the respondents operate in the services sector (25 percent in retail and 43 percent in other services), while the remainder were in manufacturing.

These two datasets have several shortcomings. First, they do not have detailed data on assets and prices, and hence one cannot measure total factor productivity. Second, both datasets are cross-sectional, i.e., one cannot track firms over time.[60] Third, they are either dated (WBES 2017) or not nationally representative (INE-WB 2023). Nonetheless, they are a first attempt to conduct 'second-generation' productivity analysis that can inform better-targeted policies to enhance competitiveness, promote entrepreneurship, and address market failures (see Cusolito and Maloney 2018). Collecting better data on Paraguayan firms on a more regular basis will be essential to formulating more effective public policies. In this context, the next Economic Census could thus yield invaluable information for policymakers on how to support firm growth, although panel data (i.e., tracking the same firms over time) would be even more useful.

Why does productivity matter?

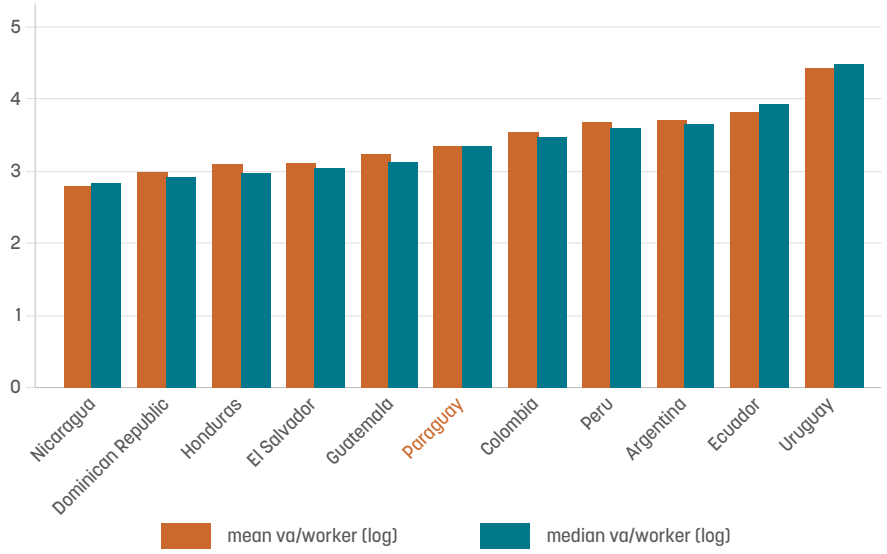
Paraguayan firms tend to be, on average, less productive than firms in some of their neighboring countries. According to World Bank Enterprise Survey data, conducted in 2016 and 2017, the average labor productivity of formal (registered) firms in Paraguay lags that of Uruguay, Ecuador, Argentina, Peru, and Colombia, although it is above all Central American countries for which comparable data is available (Figure 39). Average firm labor productivity in Paraguay is three-quarters of Uruguay's and 10 percentage points below Argentina's. This is a cause for concern given that productivity is the main determinant of economic growth (Solow 1956, Romer 1990, Hall and Jones 1999, Jorgenson and Fraumeni 1987, Gordon 2012). Higher productivity can lead to lower prices for consumers by enabling firms to lower their costs of production and to produce higher-quality goods and services, making them more competitive both domestically and internationally.

More productive firms tend to pay higher wages. In Paraguay, like elsewhere in the region, there is a positive correlation between labor productivity and wages for formal firms. According to WBES data, the most productive formal firms in Paraguay[61] pay 2.7 times higher wages than the least productive formal firms, controlling for firm characteristics such as sector and size (Figure 40). This gap is smaller than in Colombia (3.3 times) and in Ecuador (5 times). Data from the more recent INE-WB survey (2023) further confirms the positive association between productivity and wages: the most productive formal firms pay 3.5 times more than the least productive informal firms (Figure 41).

[59] The World Bank conducted a new Enterprise Survey of formal firms between June 2023 and February 2024, but the data was not available at the time of writing this report.
[60] The team received panel administrative data from the tax authorities, but it did not contain sufficient information to make any inferences on productivity (i.e., firm characteristics and the number of employees).
[61] The most productive firms are those in the top 20 percent of the labor productivity distribution; the least productive are those in the bottom 20 percent of the distribution.

Figure 39. Paraguay's formal firms are less productive than firms in several other Latin American countries

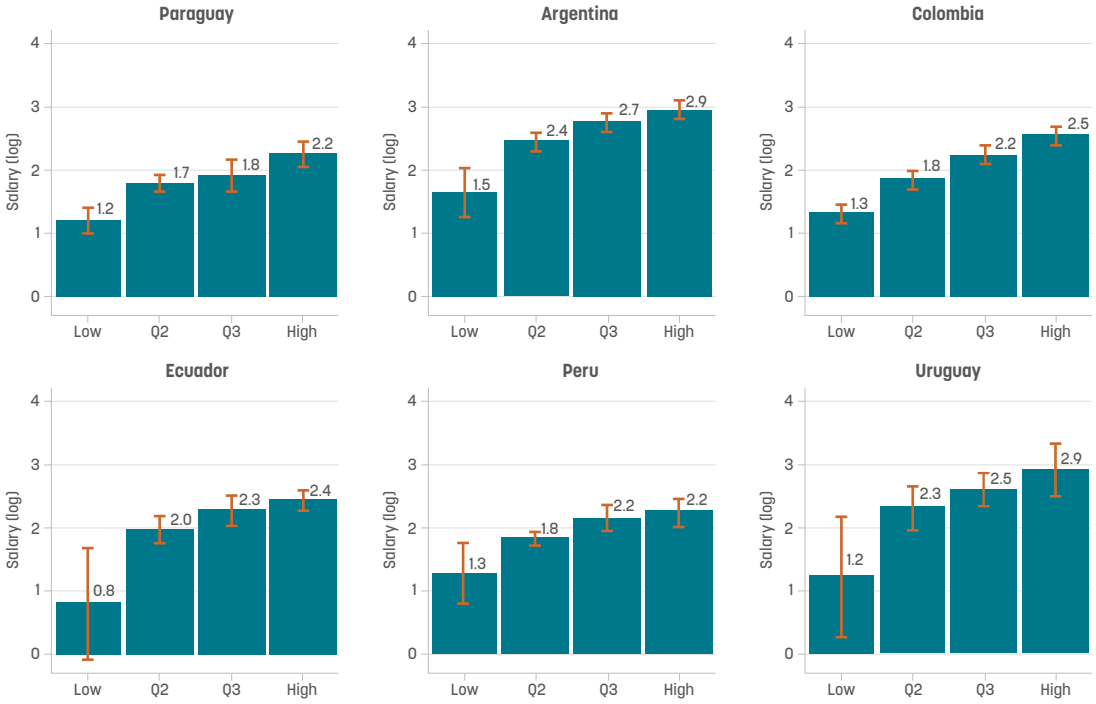
Median and mean log value added per worker, thousands of USD



Source: WBES data from 2016 and 2017. Data refer to formal firms only.
Note: Other countries not shown because data was not available for the same years. Value added is winsorized with 1 percent cuts; outliers defined as four standard deviations with respect to the sectoral mean are excluded.

Figure 40. Controlling for differences in sector and size, more productive firms pay higher wages

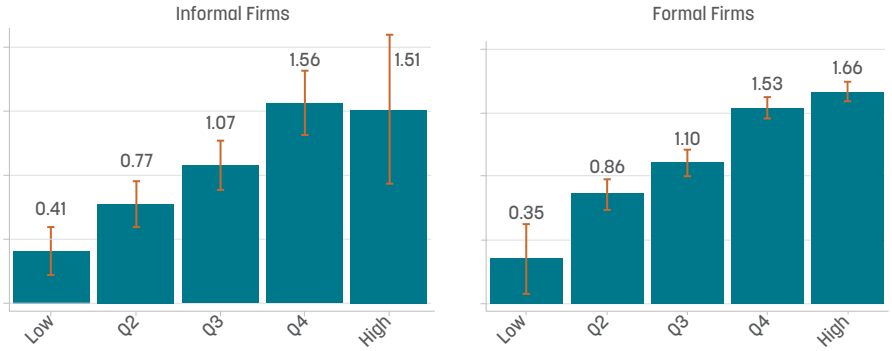
Y-axis: Log of wages (in thousands of USD); X-axis: Quartile of productivity (from low to high), log value added per worker



Source: WBES (2017). Data refer to formal firms only.

Figure 41. Controlling for differences in sector and size, more productive micro and small firms also pay higher wages — regardless of whether they are formal or informal

Y-axis: Log of wages (in thousands of USD); X-axis: Quintile of productivity (low to high), log value added per worker

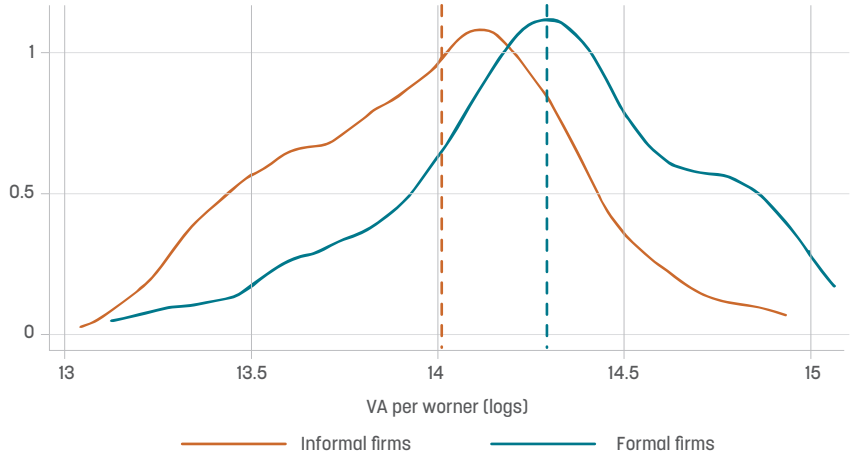


Source: INE-WB survey (2023). Survey is representative of micro and small firms in selected manufacturing and services sectors in the Asunción and Central regions.

Formal firms are more productive than informal firms. At the same time, data from the INE-WB (2023) survey on micro and small firms indicate that informal firms are much less productive than formal ones, even after controlling for some firm characteristics. Figure 42 depicts the distribution of labor productivity (value added per worker) for formal and informal firms. Comparing firms at the median of each distribution, value added per worker in a typical formal firm is 33 percent higher than that of a similar informal firm. This large productivity differential suggests that, in a hypothetical situation where the resources currently employed by informal firms can instead be employed by formal firms, overall labor productivity and hence income per capita would increase. In reality however, informal business owners will rationally decide to remain informal as long as the marginal return they receive in informality is at least as high as the marginal return from being a formal business or the wage they would receive as formal employees — what Maloney (2004) terms "voluntary informal entrepreneurs". Put simply, the net benefits of formalization need to outweigh those of remaining informal for a business owner to choose to be formal.

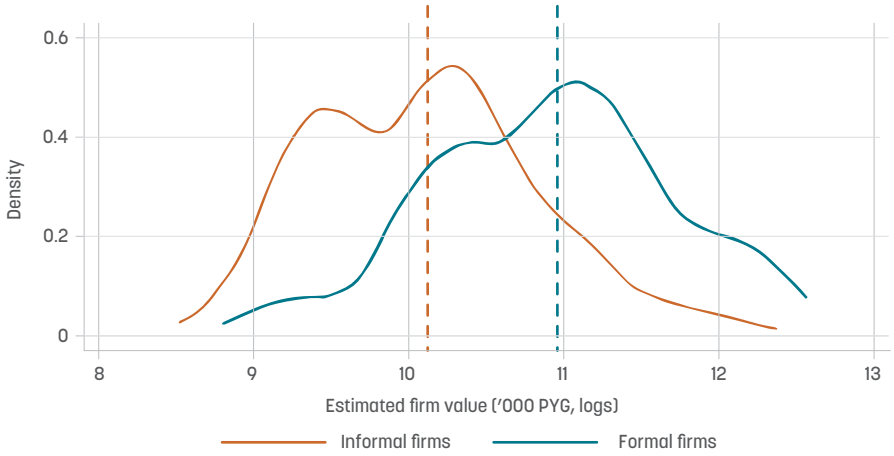
Some informal firms have productivity levels that are more akin to formal firms. Using the INE-WB (2023) survey, Figure 43 presents the distribution of responses to the question "For how much money would you agree to sell your company or business, including premises, equipment and facilities?". Comparing the two distributions, the mean estimated value of formal firms is 121 percent higher than similar informal firms. Since the valuation of a firm should reflect the net present value of the stream of profits that the firm owner expects to receive in the future (which, other things equal, would increase with a firm's prxoductivity level), this confirms that formal firms are more productive on average than informal firms. However, the estimated valuation for some informal firms (in the right tail of the distribution) is higher than the valuation of a good fraction of formal firms. Such facts suggest again that many business owners will remain informal as long as the marginal return on informality is higher than other alternatives.

Figure 42. Among micro and small businesses, formal firms are more productive than similar informal firms
Y-axis: Kernel density distribution; X-axis: value added per worker (logged)



Source: INE-WB survey (2023) of micro and small firms in Asunción and Central
Note: Conditional on gender, age of the owner and the firm, location, and sector. Dashed lines at the mean of each distribution imply a (conditional) difference of 33.1 percent in formal versus informal owners' estimated firm value.

Figure 43. Formal firms are valued more highly by their owners than informal firms
Y-axis: density of firms; X-axis: estimated firm value in '000s of Guaranies, log



Source: INE-WB survey (2023) of micro and small firms in Asunción and Central
Note: Conditional on gender, age of the owner and the firm, location and sector. Dashed lines at the mean of each distribution imply a (conditional) difference of 130.5 percent in formal versus informal owners' estimated firm value.

What are the correlates of formality and productivity in Paraguay?

Although the propensity of firms to formalize tends to increase as a country develops, the degree of informality remains considerably high in Paraguay. An estimated 63.4 percent of people employed in nonagricultural sectors in Paraguay are considered 'informal,'[62] i.e., they do not receive pension

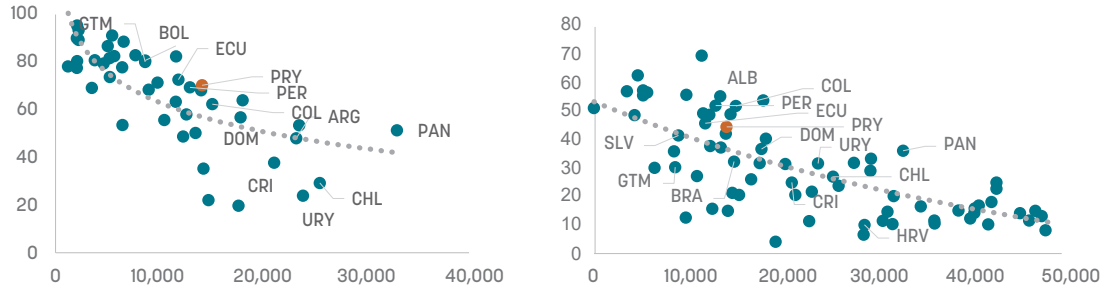
[62] INE (2021) defines informal employees as those who are not part of the pension or retirement system, employers whose establishments are not registered with MEF (*Registro Unico de Contribuyentes*, RUC), self-employed workers who are not registered with the RUC, unpaid family workers, and domestic workers who are not enrolled in the retirement system. According to INE data, the percentage of informal workers in nonagricultural sectors was 62.9% in December 2022.

benefits and are employed by entities that do not have a tax registration number. The level of informal employment in Paraguay is higher than expected given its level of income, although lower than in Guatemala (a structural peer) and comparable to Peru and Ecuador (Figure 44). The level of informality is inversely associated with income across countries, i.e., the higher the level of per capita income, the less likely informality is to be a problem. However, the persistence of high informality in Paraguay despite per capita income growth above the regional average (see Chapter 1) poses various challenges including reduced domestic revenues and, as argued below, reduced productivity.

Figure 44. Informality and self-employment tend to fall as income per capita rises

Panel a: Y-axis: Informal employment as share of total employment, percent; X-axis: GDP per capita (2017 current PPP)

Panel b: Y-axis: Self-employment as share of total employment, percent; X-axis: GDP per capita (2017 current PPP)

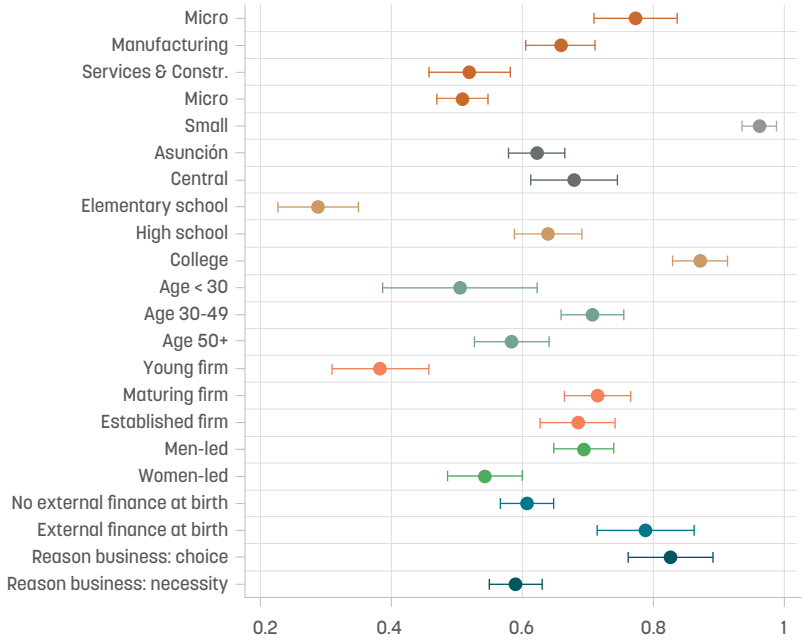


Source: Elgin et al. (2021) using data from ILO and WDI for 2019-2022.

Firms are more likely to be registered if they have been operating for longer, are owned by more educated workers or males, and had access to credit when they were established. Using data from the INE-WB survey (2023), Figure 45 indicates some of the factors associated with the probability of being formal. The estimates show that the probability of being formal increases with the size of the firm, the number of years the business has been operational, and as the education level of the owner rises. The probability of a firm being formal also increases if the firm had access to external financing from a bank or other financial institution when it was created. By contrast, the probability of formalization declines with female ownership and with entrepreneurship of 'necessity', i.e., if the reason for establishing the business is related to poor labor market conditions. The probability of a firm being formal is also higher in the retail sector and lowest in services (transport, ICT, auto-repair, and other services) and construction.

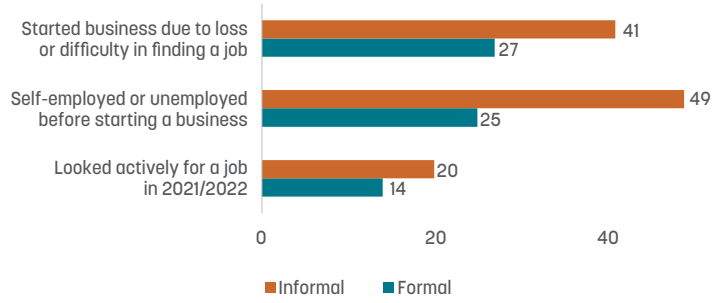
According to the results of the INE-WB 2023 survey, inadequate access to opportunities in the formal labor market appears to be a major determinant of informality in Paraguay. When opportunities for formal salaried (wage) employment are scarce or inaccessible, starting a small, informal business is the easiest, most logical option for individuals seeking to earn a living as there are minimal requirements in terms of skills or qualifications (see Portes et al. 1989 and Perry et al. 2007). Indeed, in Paraguay, a larger share of informal business owners state that they started their current business due to job losses or difficulty in finding a job (Figure 46, Panel a). Similarly, a larger share of informal business owners report being either self-employed or unemployed in the three months prior to launching their business, and were slightly more likely to have actively sought salaried employment in 2021 and 2022.

Figure 45. Education, gender, and access to finance are predictors of firm formalization status
Predicted probability of being formal, percent



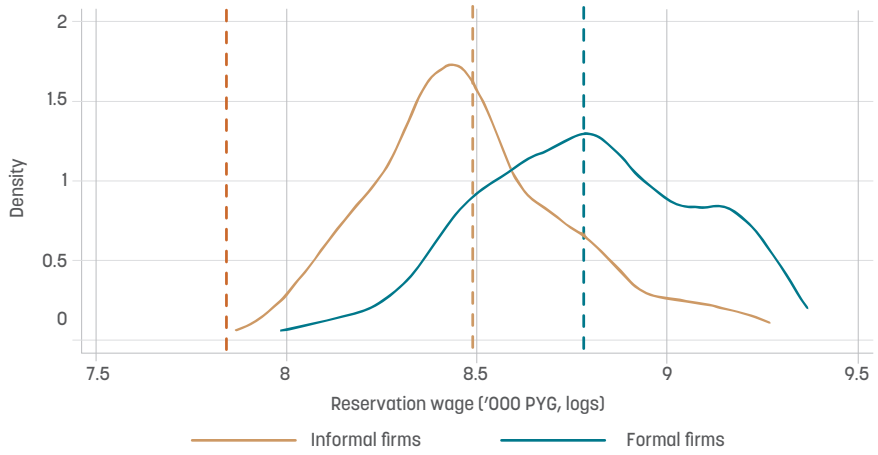
Source: INE-WB survey (2023) of micro and small firms in Asunción and Central.
Note: Chart shows the results of probit regressions, reflecting the marginal impact of each variable on the probability of being formal. The education level categories used in the figure — "elementary school", "high school", and "college" — correspond to what the survey captures as "primaria", "secundaria", and "superior".

Figure 46. Pervasive informality in Paraguay may reflect the lack of access to good jobs in formal firms
Panel a: Share of respondents, percent of total



Source: INE-WB survey (2023) of micro and small firms in Asunción and Central.
Note: Unconditional means.

Panel b: Y-axis: density of firms, X-axis: reservation wage ('000s of Guaranies, logs)



Source: INE-WB survey (2023) of micro and small firms in Asunción and Central.
Note: Conditional on gender, age of the owner and the firm, location and sector. Dashed lines at the mean of each distribution imply a (conditional) difference of 33.8 percent in formal versus informal firm owners' reservation wages.

Most informal business owners are willing to shift from self-employment to a salaried job. 53 percent of informal business owners surveyed said that they would accept salaried employment if they could earn a similar amount as they currently do, in addition to health insurance coverage. This share goes up to 60 percent if retirement benefits are included. In addition, Figure 46, Panel (b) shows that owners of informal businesses would be more willing to sell their businesses to accept jobs that pay lower wages compared to owners of formal firms.[63] However, for both types of firms, these "reservation wages" are much higher than the official minimum wage: estimated at the median value, the reservation wage among informal firms is 1.8 times higher than the minimum wage, whereas it is 2.5 times higher among formal firms.[64, 65]

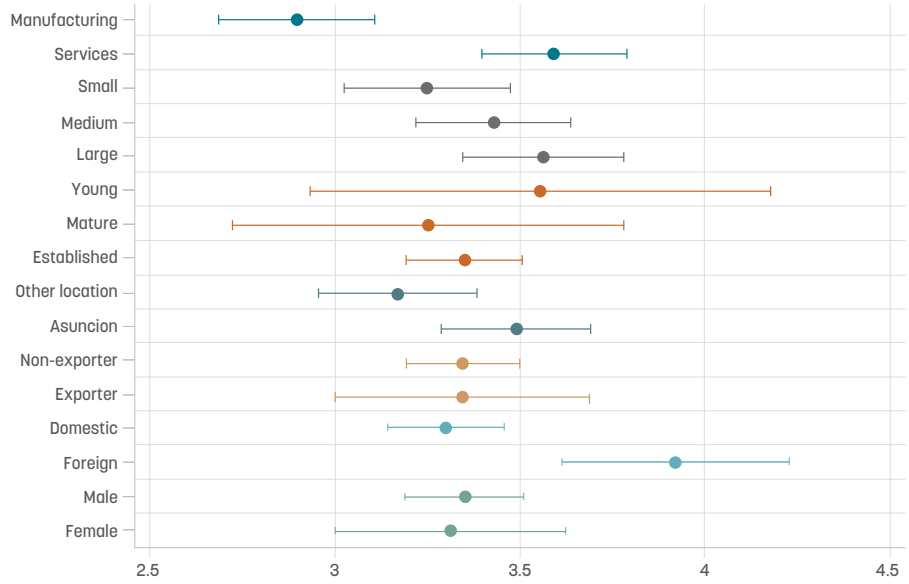
Looking only at formal firms, size and firm capabilities appear to matter for productivity.[66] The two surveys present varied evidence on firm characteristics that drive higher productivity. In the WBES (2017) sample of formal firms in Paraguay, larger formal firms tend to be more productive than smaller ones, perhaps reflecting more advanced firm capabilities (Figure 47). Moreover, foreign-owned firms and exporters tend to be more productive than other firms. Foreign ownership is associated with exporting firms and higher productivity, indicating the importance that knowledge transfers may have on firm performance and on expanding to foreign markets (Patiño Peña 2022). Finally, unlike what has been observed in many other countries, formal firms in the services sector are more productive than their manufacturing counterparts. This may, however, be the result of weaknesses among manufacturing firms rather than strengths among services firms, especially given that informality is pervasive in the services sector (see Chapter 3).

[63] In some countries self-employed workers (business owners) on average earn more than formal salaried workers. See, for example, Maloney (2004).
[64] The "reservation wage" is assumed to be given by the answer to question B13 in the INE-WB survey, which asks "What is the monthly salary that you would be willing to accept in order to leave your firm or business?" (*¿Cuál es el salario mensual por el que usted aceptaría dejar su empresa o negocio?*).
[65] The official monthly minimum wage in Paraguay was PYG 2,550,307 or USD 370 from 1 July 2022 to 30 June 2023. As of 1 July 2023, it rose 5.1 percent year-on-year. It is high by international standards (OECD 2018).
[66] Firm size and productivity are not necessarily positively correlated in all Latin American countries (World Bank 2024).

Size and education also matter for small and micro firms, regardless of formality status. In the INE-WB survey (2023), the sector does not seem to matter for productivity, while size still does (Figure 47, Panel b). Small firms indeed tend to be more productive than micro firms. In addition, education (a proxy of firm capabilities) and gender seem to matter. Firms led by owners with more education tend to be more productive, and male-led firms are also more productive than female-led ones.

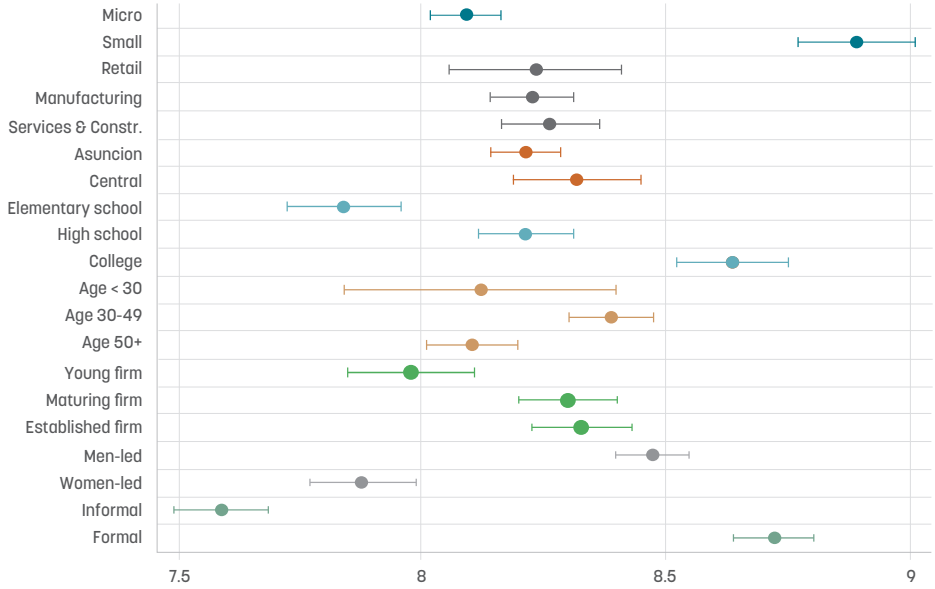
Figure 47. Size and firm capabilities matter for firm productivity

Panel a: Small, medium, and large formal firms



Source: WBES (2017). Data refer to formal firms only.

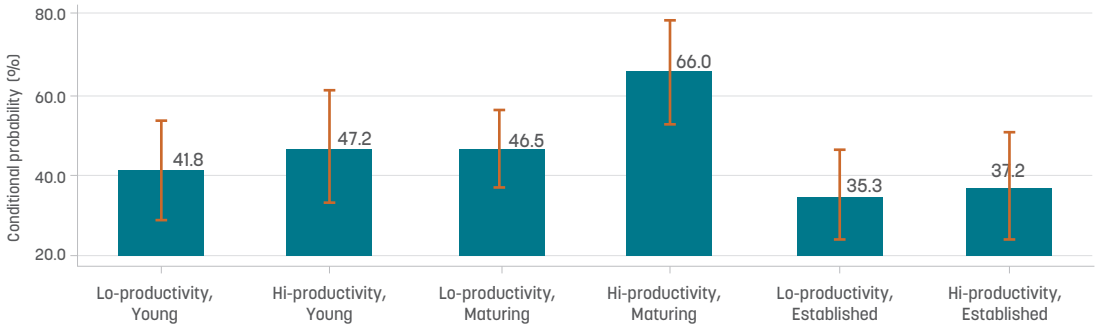
Panel b: Micro and small firms



Source: INE-WB survey (2023) of micro and small firms in Asunción and Central.

Most informal businesses, particularly those that are well established, see limited benefit in becoming formal. When asked whether they think that obtaining a tax ID (RUC) would have an impact on the number of customers they have, only 45 percent of informal firms responding to the INE-WB (2023) survey said they would receive more customers. In fact, 53 percent of micro and small businesses believe that the number of customers would remain unchanged, while 2 percent of firms think the number of customers would drop. To investigate whether the level of productivity and age of the firm drive these responses, firms are grouped into six categories (Figure 48). While the differences between the groups are not statistically significant, two interesting observations emerge:

Figure 48. Many informal firms believe that obtaining a tax ID would not expand their customer base
Y-axis: conditional probability that an informal business believes that becoming formal will increase their customers, percent; X-axis: Classification by firm age and productivity level



Source: INE-WB (2023) survey of micro and small firms in Asunción and Central.
Note: Conditional on sector, region, size, gender and education level. Low (high) refers to the bottom (top) quartile of the distribution of labor productivity among informal businesses. Young firms are defined as being in operation for 0-4 years; maturing for 5-14 years and established for 15 or more years.

i. **Established firms, defined as those having been in operation 15 years or more, see the lowest benefit in becoming formal, irrespective of their productivity level.** Only around 36 percent of such firms expect to see an increases in their customer base. At the other extreme, young firms are more optimistic than the oldest businesses about the benefits of formalization, although the differences are not statistically significant.

ii. **The perceived benefits of formalization are higher among the most productive firms, all else equal.** Two-thirds of the most productive firms that are still maturing (5-14 years old) expect an increase in the number of customers if they were to become formal.

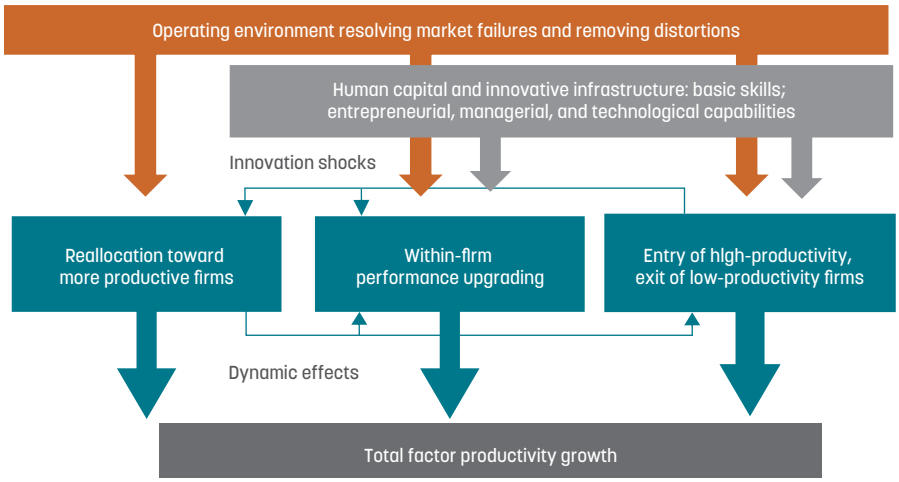
The more productive the firm, the more appealing formalization may be as a pathway to obtain better access to financing and to expand. The data suggest that there is a process of self-selection into formality and informality as firms get older, which is influenced by how productive they are. Businesses that have been informal for 15 years or more are very unlikely to ever become formal on pure business grounds. Presumably, businesses in their age cohort that were productive as they were maturing would have been more likely to register as they aged — as the fourth column in Figure 48 suggests. Those that remain informal have an established business model that has persisted over the years despite not registering. Moreover, the odds that young informal firms become formal are less than one half. This may be because they are still "testing the market" or only existing temporarily until a more profitable waged job becomes available. By contrast, more

productive informal firms that have survived during their first four years may now be in a position to further expand their businesses. Programs to encourage firm registration may therefore require careful targeting to be effective.

How does Paraguay fare on the three margins of firm-level productivity?

There are three 'margins' or channels through which productivity growth occurs. First, the most efficient firms can draw more capital and hire more workers to grow — the "between channel". Second, firms invest in strengthening their productive capabilities — the "within channel". Third, new and more productive firms enter a market and replace less-efficient businesses, which go on to exit the market — the "selection channel". Cutting across these channels is the complementary relationship between the business environment and firm capabilities (Cusolito and Maloney 2018). Factors such as macro stability and competition policy impact productivity by facilitating resource transfer to more productive firms, encouraging incumbents to invest in innovation, and facilitating the entry/exit of firms. However, entrepreneurs also need to have the necessary managerial, organizational, and technological skills to take advantage of the undistorted, stable business environment. Progress is needed on both fronts for productivity growth (Figure 49).

Figure 49. Boosting productivity can occur in three ways, supported by a healthy operating environment for businesses



Source: Cusolito and Maloney (2018).

Between channel: Reallocation of resources toward more productive firms

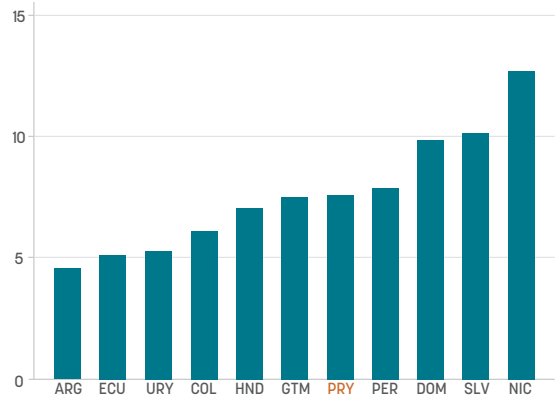
The large dispersion of productivity among formal firms points to a sizable misallocation of factors of production. Paraguay, like most developing economies, faces the challenge of allocating its factors of production — capital, land, and labor — efficiently. As previously indicated, these resources are currently disproportionately allocated towards low-productivity activities in the informal sector, which leads more productive formal firms to face constraints in accessing them. However, misallocation is also evident in the dispersion of productivity levels observed among formal firms:

the top quintile of firms is almost eight times more productive than firms at the other extreme (Figure 50). This disparity is higher in Paraguay than in Argentina, Uruguay, Ecuador, Colombia, Honduras, and Guatemala, although lower than in the remaining LAC countries surveyed. The disparity is even larger in the services sector: the top 20 percent most productive firms are almost 15 times more productive than the bottom 20 percent. This is the largest dispersion compared to other LAC countries in all sectors. Specifically, the dispersion of productivity in wholesale and retail services is larger in Paraguay than most countries (4th largest out of 11 LAC countries analyzed).

Figure 50. The dispersion of productivity suggests that resources are not allocated efficiently

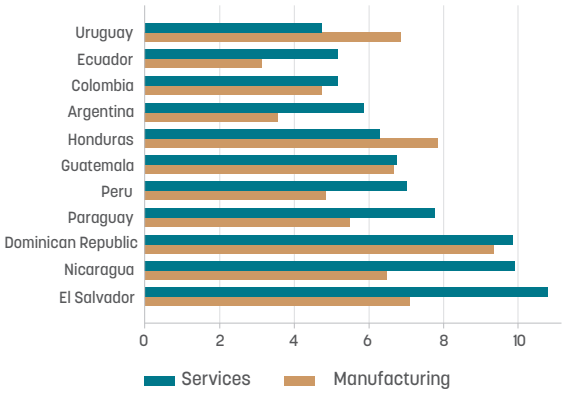
Ratio of value added per worker among the top 20 percent of all firms versus the bottom 20 percent

Panel a: All firms



Source: WBES (2017). Data refer to formal firms only.

Panel b: Services and manufacturing firms



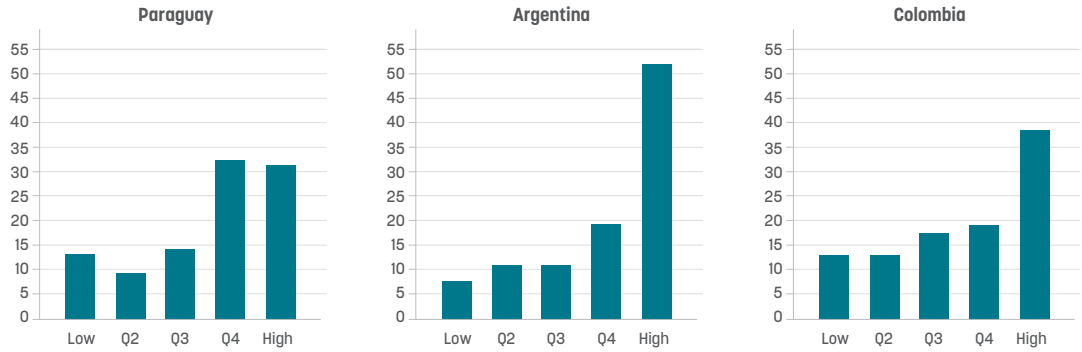
Source: WBES (2017). Data refer to formal firms only.

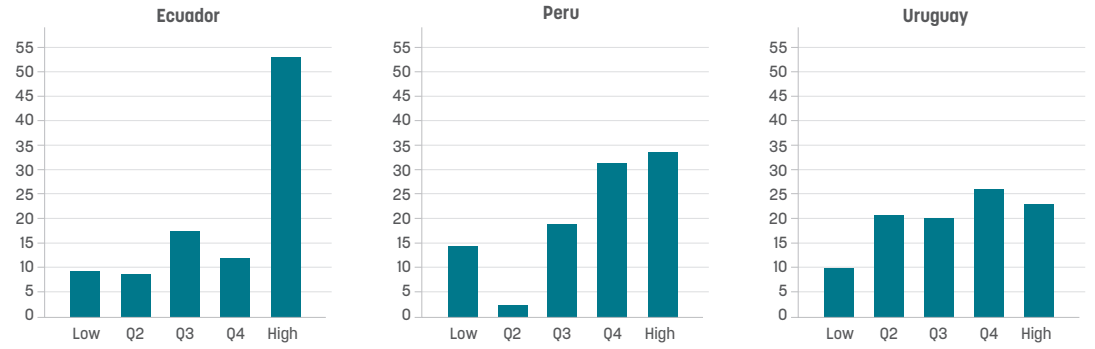
Among formal firms, employment is not concentrated in the most productive ones. Ideally, the most productive firms should hire as many workers as possible. However, this is not exactly the case in Paraguay: firms in the top two quintiles of the productivity distribution (i.e., firms that are in top 40 percent in terms of labor productivity) employ only approximately 47 percent of all formal sector workers (Figure 51, Panel a). In contrast, the same figure exceeds 50 percent in Argentina, Colombia, and Uruguay. The situation is worse in the manufacturing sector (Figure 51, Panel b), but better in the services sector (Figure 51, Panel c).

Figure 51. Employment is not concentrated in the most productive formal firms

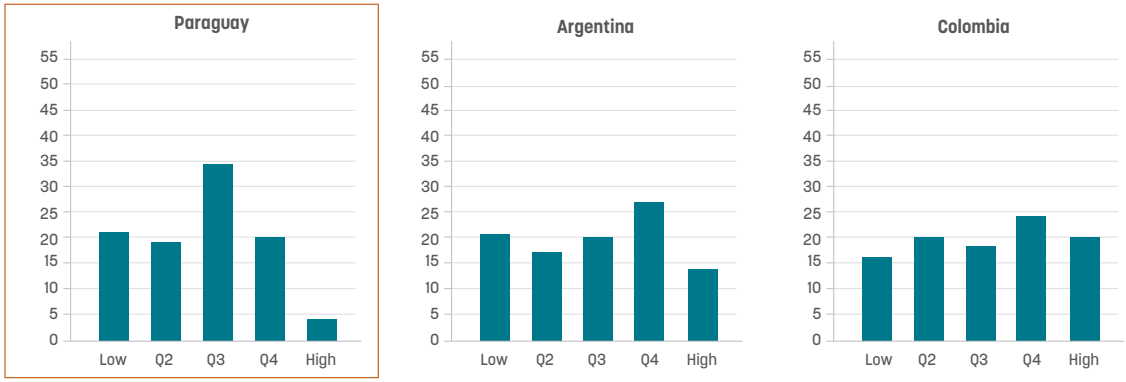
Y-axis: Share of workers employed in each quintile; X-axis: productivity quintile (low to high)

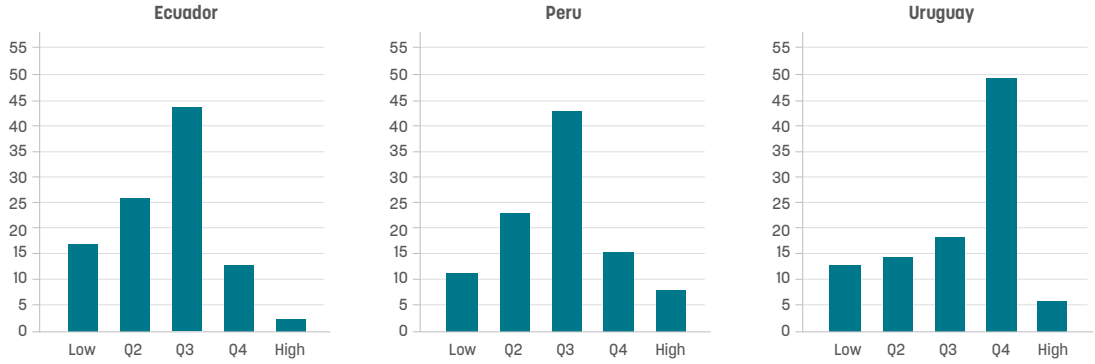
Panel a: All firms



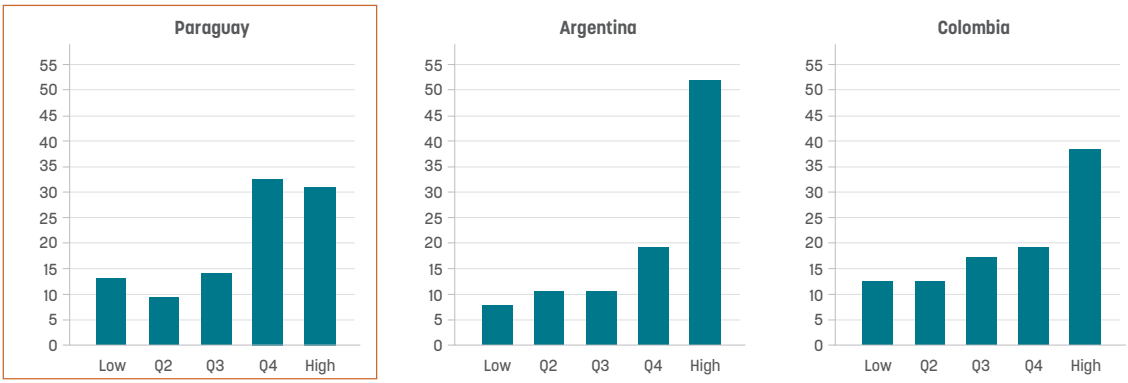


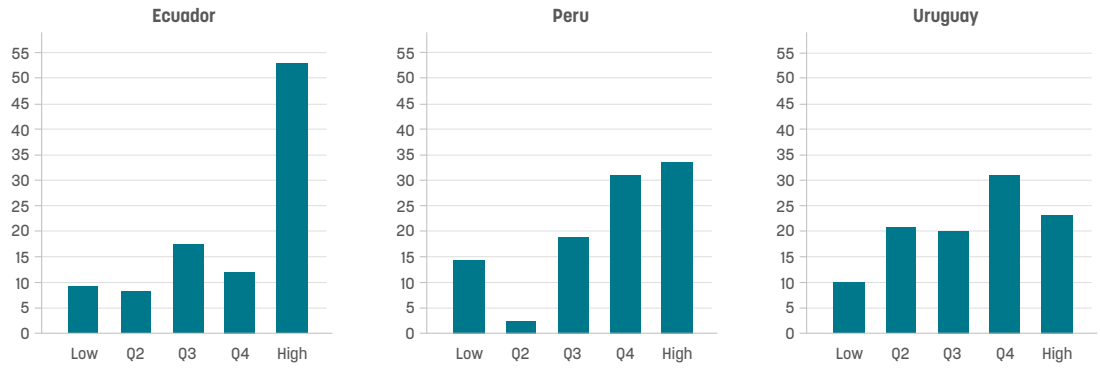
Panel b: Manufacturing firms only





Panel c: Services firms only





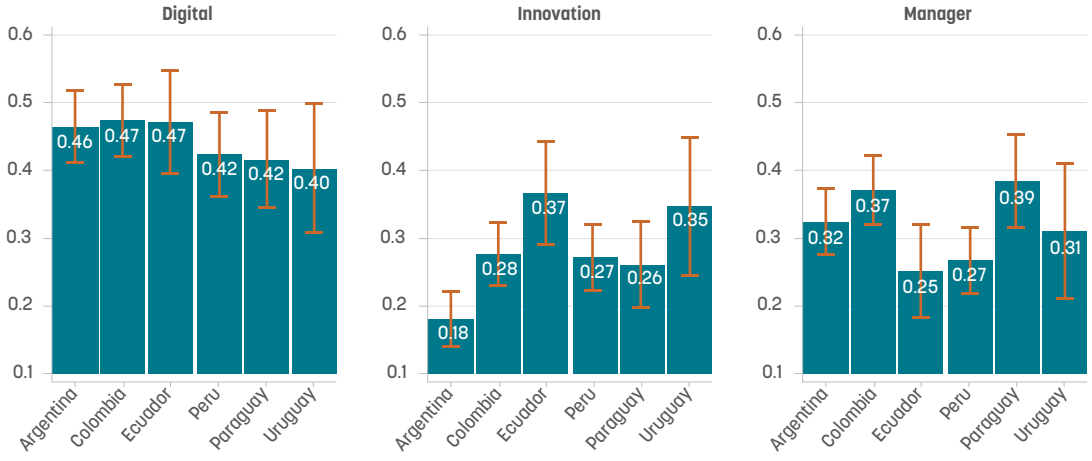
Source: WBES (2017). Data refer to formal firms only.

Within channel: Performance upgrading inside the firm

Limited productive capabilities[67] among businesses, particularly within the informal sector, are a significant factor that hampers productivity in Paraguay. Both formal and informal firms in Paraguay have room to strengthen their capabilities in several areas. Looking at formal firms interviewed in the WBES (2017), Paraguay's digital preparedness and innovation are lower than in other LAC countries, but it has relative strengths in managerial capacity (Figure 52).

Figure 52. Paraguayan firms rank better in terms of managerial capabilities, although they show lower levels of digital preparedness and innovation

Predicted probability of firm capabilities, percent



Source: WBES (2017). Data refer to formal firms only.
Notes: Regressions control for differences in sector and size. "Digital" takes the value of one if firm has at least two of the following: (i) communicates through email, (ii) has website, or has expenses in software or database, and zero otherwise. "Innovation" takes the value of one if firm has at least three of the following: (i) new or significantly improved products, or (ii) processes in the last three years, (iii) has intellectual property, or (iv) has developed a creative design. It takes the value of zero otherwise. "Manager" takes one if firm has all three of the following: (i) organizational development expenses, (ii) monitors at least three performance indicators, and (iii) has production or service provision targets. It takes the value of zero otherwise.

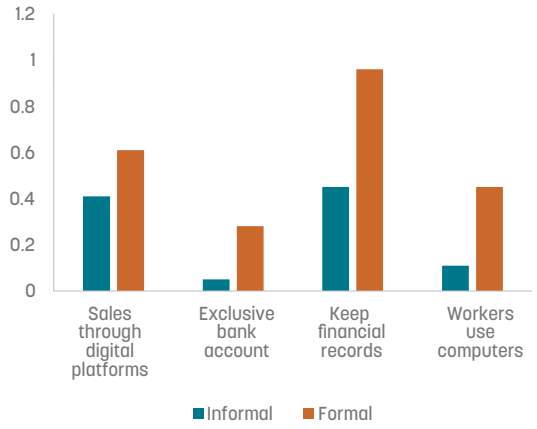
[67] Includes managerial skills, workers' skills, innovation capacity, technology adoption, and digital capabilities.

However, among Paraguayan firms alone (Figure 53), formal firms appear to be better than informal firms in their use of digital technology and financial management practices. Formal firms are more likely to conduct sales through digital means and have a higher share of employees who know how to use computers. They also are more likely to state that they have an exclusive bank account for their businesses and that they keep some type of financial records.

Firms that use digital technology, that have better managerial practices, and more qualified staff are more productive. Firms that sell online or through platforms, that use a bank account exclusively for business transactions, that keep financial records, and those with more skilled workers are relatively more productive than those that do not (Figure 54).

Figure 53. Formal firms have better digital and financial practices than informal firms

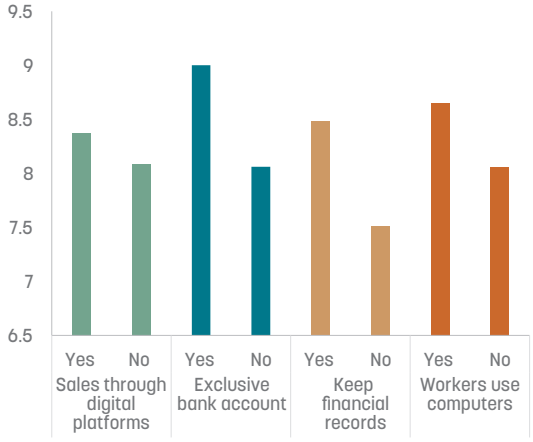
Conditional share of micro and small firms that have the following practices, percent



Source: INE-WB survey (2023) of micro and small firms in Asunción and Central.
Note: Controls for differences in sector. Based on regressions that estimate the predicted probability of micro and small firms in the sample that sell online, use a bank account exclusively for business, keep financial records, or have a higher share of workers using computers.

Figure 54. Firm capabilities are correlated with productivity

Correlation of labor productivity (dependent variable) with firm capabilities, percent



Source: WBES (2017). Data refer to formal firms only.
Notes: Controls for sector, size, location, age and formality, and for education, age, and gender of the owner. Firms' capability is proxied by whether firm sells online, uses a bank account exclusively for business, keeps financial records, and by the share of workers using computers.

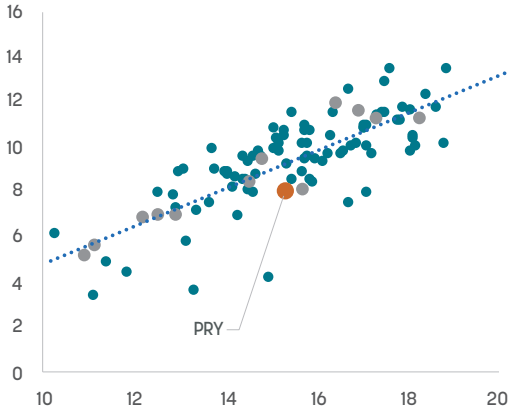
Selection channel: Entry of more productive and exit of less productive firms

A third constraining factor to higher productivity growth is the modest creation of productive formal firms and the persistence of less productive businesses. The rate of creation of new formal businesses in Paraguay lags the levels observed in other countries. The density of new businesses in the country — that is, the number of newly registered firms with limited liability per 1,000 people of working age (ages 15-64) — is a mere 0.05, much lower than in Chile (10.7), Costa Rica (4.7), or Peru (4.1). Indeed, the annual creation of new businesses is substantially lower than what Paraguay's working-age population would suggest (Figure 55). Paraguay should be creating almost 10 times more formal limited-liability businesses than it created in 2019.

Young firms in Paraguay represent only a small fraction of all formal firms in the country. The sluggish creation of new firms is consistent with the low share of young firms that is observed in Paraguay relative to other countries in the region (Figure 55, Panel b). Established businesses with more than 15 years of operation represent the bulk (78 percent) of all formal firms in Paraguay, only behind Guatemala and Peru. Established firms typically are less dynamic in terms of job creation, as the rate at which they hire new workers falls as they get older. Moreover, as mentioned earlier, established firms are, on average, statistically not more productive than younger formal firms.

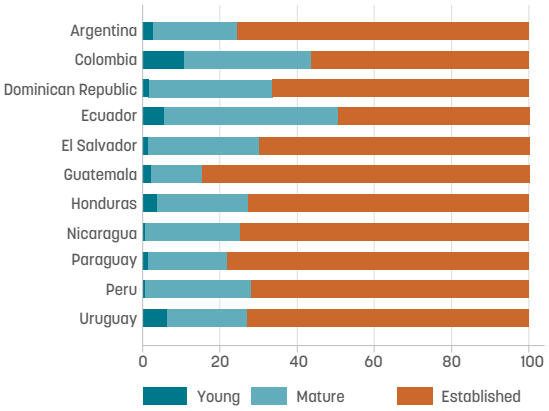
Figure 55. The creation of new registered firms in Paraguay lags other countries in the region

Panel a, Y-axis: log of new business creation;
X-axis: log of working-age population (millions)



Source: World Bank 2023d.
Note: New businesses are newly-created limited liability companies. Gray dots are LAC countries.

Panel b: Share of firms according to age, percent of total



Source: WBES (2017). Data refer to formal firms only.
Note: Young firms are defined as being in operation for 0-4 years; maturing for 5-14 years and established for 15 or more years.

Formal firms create more employment than informal firms over their lifetime. Using INE-WB (2023) survey data, firms are categorized into young, maturing, and established to compare their mean annual employment growth rate (Figure 56, Panel a).[68] For formal businesses, employment grows at a decreasing rate as they get older. Young formal firms expand at an impressive 15.7 percent per year, which declines to 3.9 percent as they are maturing (5-14 years) and to 1.2 percent as they are established firms (15 or more years). The growth profile of informal firms is drastically different. Young informal firms grow faster than older firms, but at an annual rate of 4.6 percent, they are clearly less dynamic than formal firms. Moreover, maturing and established informal businesses appear to be contracting on average, with negative growth rates. The latter may reflect a process of self-selection in which more productive firms that are informal at first transition to formality over time, so that older informal firms are those that have had limited growth prospects from the start.

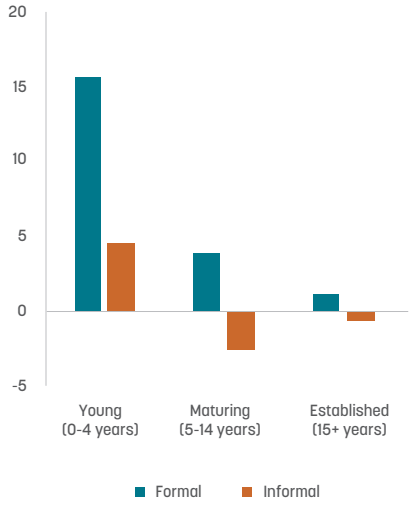
A process of creative destruction, whereby low productivity firms exit the market and are replaced by higher productivity entrants, does not seem to occur effectively in Paraguay. INE-WB (2023) survey data signals that low productivity firms, particularly those in the

[68] The INE-WB survey asks respondents about the number of workers they employed in the year in which the firm began operations. This information is used to calculate the average *annual* employment growth rates for each firm.

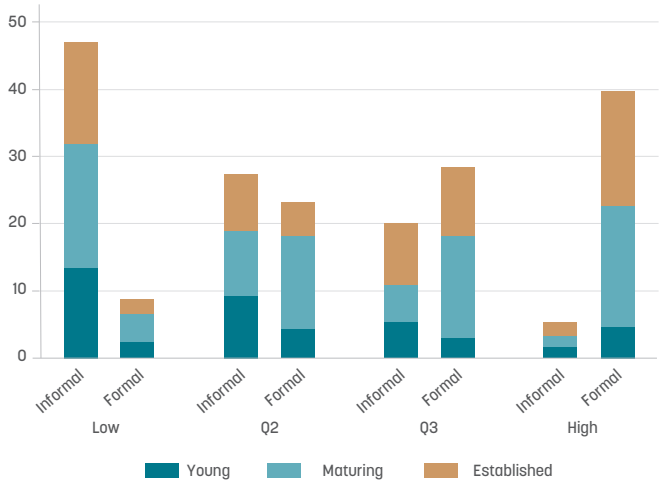
informal sector, linger around for years (Figure 56, Panel b). The share of young firms is higher in the lowest productivity quartile, while smallest share is in the most productive quartile. Furthermore, young firms are more concentrated in informal firms, which indicates that informal and low-productivity firms are created at a faster rate than formal firms. At the same time, 44 percent (60 percent of which are informal) of all established firms (15 years or older) are in the lower quartiles of productivity. In particular, among the least productive firms that are informal, we find a large fraction of firms that are 15 years or older. The persistence of these firms draws resources away from more productive activities.

Figure 56. Employment grows faster in formal firms especially when they are young

Panel a: Average annual employment growth rate according to firm age, percent



Panel b: Share of firms according to age, productivity level and formality status, percent of total



Source: INE-WB (2023) survey of micro and small firms in Asunción and Central.
Note: Conditional on region and sector. Right panel shows percentage of firms by age, formal status, and productivity level. The total adds up to 100.

The malfunctioning of the 'selection channel' has implications for the dynamics of the other two channels driving productivity. The limited creation of productive formal firms implies that resources are not effectively allocated to their most efficient uses. At the same time, the persistence of low productivity firms, with limited innovation and technological capabilities, constrains the ability to increase efficiency or capabilities within the firm. The problem is exacerbated by the large informal sector, which mostly comprises lagging, lingering firms with limited growth prospects.

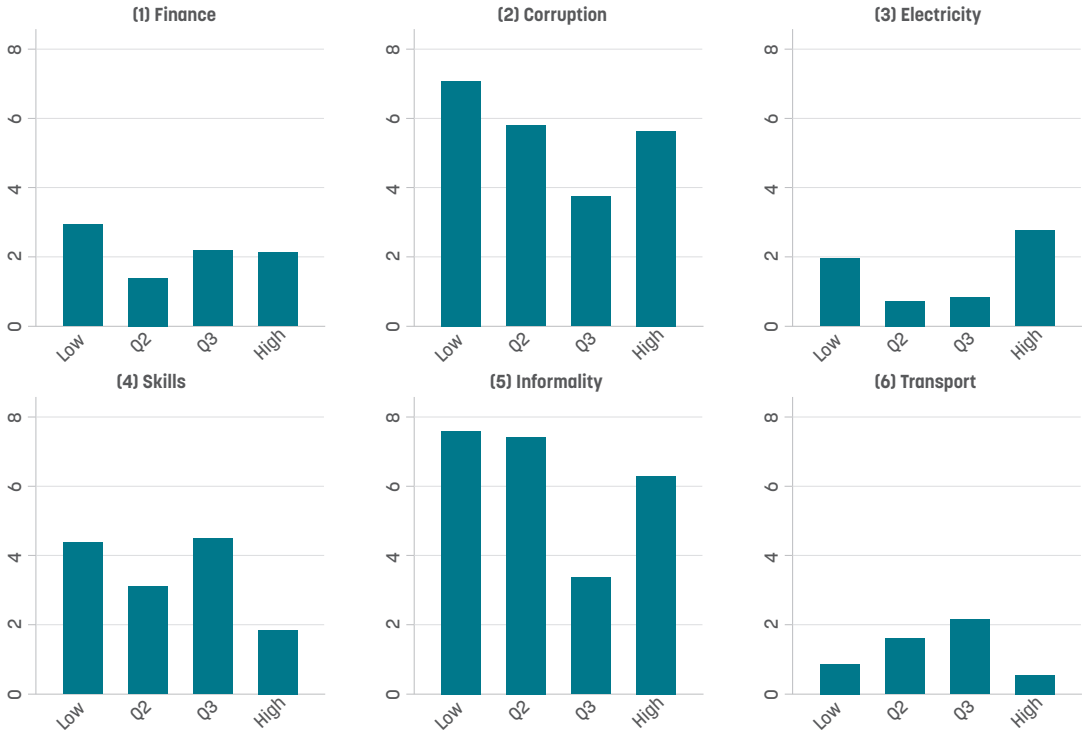
Which challenges are the most binding constraints for growth, according to firms?

Institutions and the rule of law, including corruption and informality, are the most pressing constraints faced by formal firms according to the firms interviewed by the World Bank in 2017. Figure 57 presents the six major obstacles to business expansion as perceived by formal firms, grouped by quartile of labor productivity. Formal firms perceive corruption and

informality (panels 2 and 5) as the main obstacles affecting their operations. Both barriers, which reflect weaknesses in the rule of law, are also the most prominent among firms with higher productivity. The lack of appropriate skills and access to finance are the third and fourth most common complaints, respectively. Poor workforce skills (panel 4) seem to be an important barrier for all firms, except the most productive ones. In contrast, complaints about the lack of access to finance are slightly higher among the least productive firms (panel 1). Finally, both the least and the most productive firms complain more about electricity disruptions.[69]

Figure 57. Formal firms perceive corruption and competition from informal firms as the most prominent constraints affecting their operations

Y-axis: Share of respondents stating that the given constraint is the major obstacle faced by the firm;
X-axis: level of labor productivity



Source: WBES (2017). Data refer only to formal firms.

"Unfair" competition is another widely perceived constraint by formal firms. According to 2017 WBES data, Paraguay's formal firms are more likely to identify competition from informal firms as a challenge to their expansion (71 percent) compared to firms in other LAC countries (Figure 58, Panel b). They are also more likely to complain about competition from firms that underreport sales or payroll. Similarly, both informal and formal firms responding to the INE-WB (2023) survey stated that "practices of competitors" were the second biggest obstacle to firm growth.[70] Competition from informal firms appears to affect all formal Paraguayan

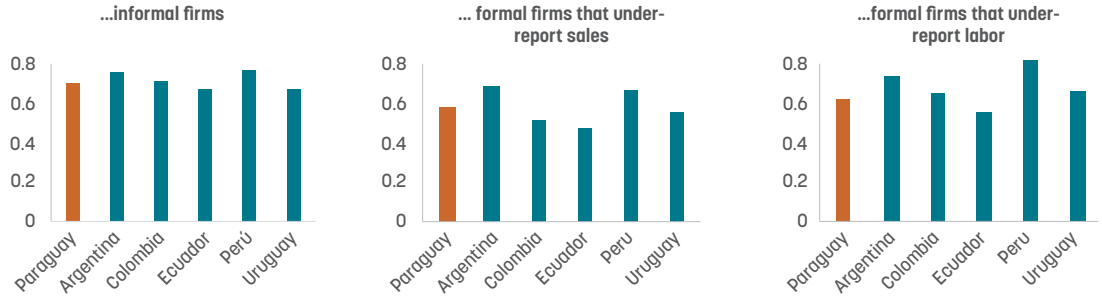
[69] In addition to these six, the WBES reports the opinions of firms on another nine potential obstacles. Some firms state that labor regulations, crime, and taxes are also major constraints.

[70] This was reported by 16.7 of informal firms and 18.8 percent of formal firms. See Figure 61, panel 10.

firms regardless of their productivity levels, although less productive firms complained more (Figure 58, Panel b). On the other hand, the most productive firms complained more frequently about competition with other formal firms that underreport labor contracts. Such "unfair" competition may undercut sales, thereby affecting firms' growth prospects and the efficient allocation of resources. These results could reflect shortcomings in firm capabilities to compete, the weak institutional environment, especially when it comes to the enforcement of property rights,[71] market concentration in some industries (see Chapter 3), and weak enforcement of competition policy (see Box 4).

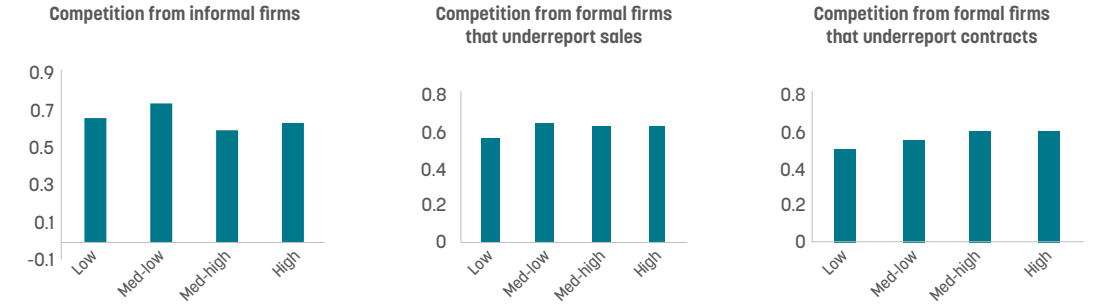
Figure 58. Competition from informal enterprises is a challenge for formal enterprises, regardless of their productivity levels

Panel a: Estimated probability of competition from formal firms relative to... (percent)



Source: WBES (2017). Data only refer to formal firms.
Note: Controls for sector

Panel b: Estimated probability of competition from Paraguayan companies, by level of productivity, in relation to...(percentages)



Source: WBES (2017). Data only refer to formal firms.
Note: Controls for sector, region, and size.

[71] Paraguay scored 117 out of 141 countries (0 = best, 141 = worst) on the strength of property rights protection in the 2019 WEF Global Competitiveness Index. Its performance has improved in recent years, as indicated by the Heritage Institute's Index of Economic Freedom, but remains lower than most peers.

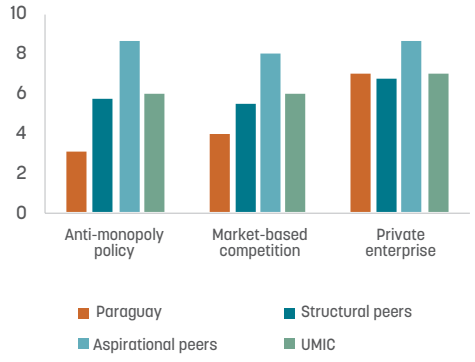
Box 8. Stringent enforcement of competition policy could boost the productivity of Paraguayan firms

Competition policy can help to reduce barriers to firm entry and expansion by leveling the playing field among different types of firms. Paraguay passed a law on competition in June 2013 and established a National Competition Commission (*Comisión Nacional de la Competencia* or CONACOM) in July 2015. However, its anti-monopoly policy and market-based competition is perceived to lag peers (Figure 59), partly because CONACOM is not an independent authority and has persecuted few relevant cases so far,[72] as well as being a relatively new institution.

Moreover, some aspects of the public procurement regulatory framework allow for differential treatment of firms. For example, domestic bidders enjoy certain privileges over foreign bidders (e.g., a preference gap in the price of up to 40 percent and reserving a percentage of contracts of goods and services). In addition, respondents to the 2019 WEF Global Competitiveness Index survey perceive corporate activity to be dominated by a few firms, and the services sector to lack in competitiveness compared to peers (Figure 60). This is likely due to the high presence of the state in networked industries (see Chapter 3).

Figure 59. Paraguay is perceived to have a less level playing field for firms compared to peers...

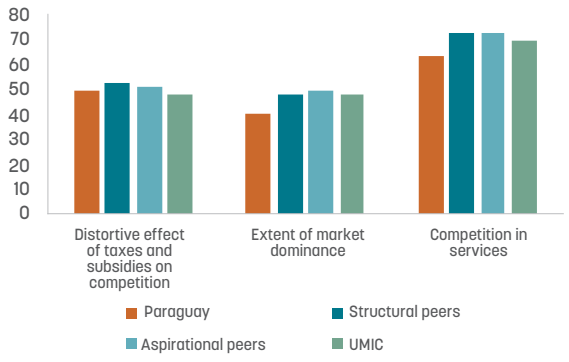
Score (1 = worst, 10 = best)



Source: Bertelsmann Stiftung 2022.

Figure 60. ...especially when it comes to the services sector.

Perception of performance (0 = worst, 100 = best)



Source: WEF 2019.

Strengthening the role of CONACOM is key to promote a fair and competitive playing field for all firms in Paraguay. CONACOM currently faces challenges in collecting direct evidence of infringements due to limited powers and insufficient technical and financial resources. Moreover, gaps in the competition regulatory framework include a lack of clarity in the merger control framework and relatively weak advocacy powers of CONACOM. Like most of the region, CONACOM needs more resources and authority to enforce antitrust laws. In addition, given that only high-capability firms innovate in response to competitive pressure, competition policy needs to be well coordinated with measures to improve the ability of entrepreneurs and business practices.

Source: World Bank 2022b; World Bank 2024b.

[72] While the first cases of anti-competitive practices were resolved by CONACOM in 2021, the first sanctions were not enacted until 2022. Before that, CONACOM enacted several sanctions in cases involving merger condition violations. Source: OECD (2022).

Access to finance was named as the top constraint to expansion by micro and small firms, regardless of formality status. A quarter of respondents to the INE-WB survey (2023) cited access to finance is the biggest constraint to business growth, with a slightly higher prevalence among informal firms (Figure 61). Indeed, the finance gap for medium, small, and micro enterprises (MSMEs) in Paraguay in 2017 was USD 3.97 billion, nearly three times larger than the regional average (Khanna et al. 2017). According to results of the 2017 World Bank survey (WBES), only about a third of MSMEs are estimated to have access to finance. Some reasons for the large finance gap include the lack of awareness about the benefits of access to formal financing; complexity of loan application processes; the belief that businesses are unable to comply with the necessary requirements; high interest rates; and the lack of financial records and of viable business proposals. In addition, the ecosystem for early-stage financing (business angels, venture capital, and crowdfunding) is in its initial stages in Paraguay.

Figure 61. Access to finance and practices of competitors are the two major complaints of micro and small firms, regardless of formality status

Positive responses in each category, percent of firms

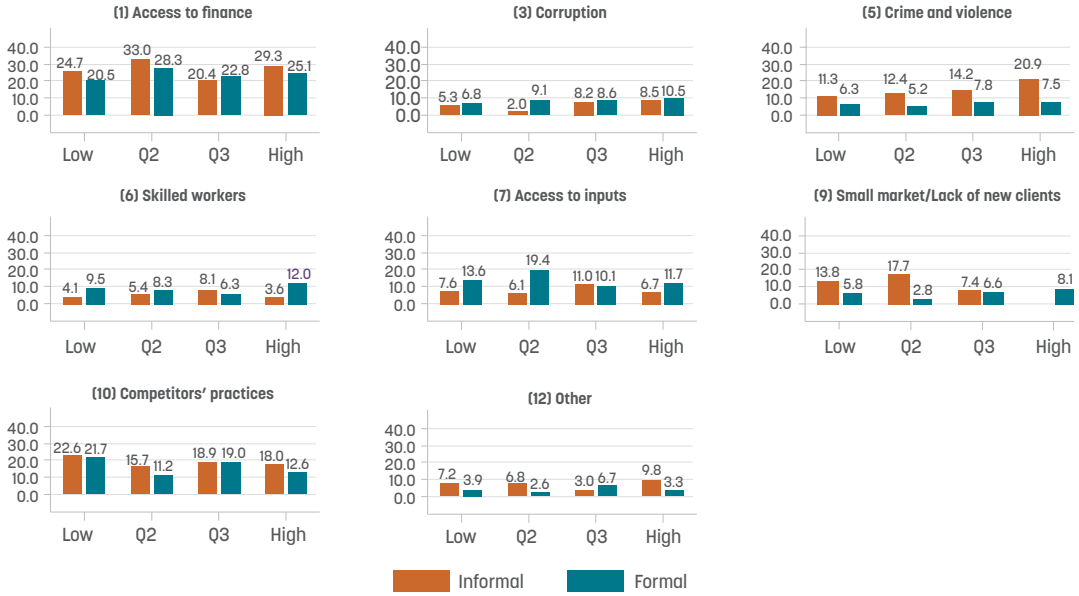
Source: INE-WB (2023) survey of micro and small firms in Asunción and Central.
Note: Conditional on sector and region. Apart from access to finance and competition, formal firms chose difficulties in the supply of intermediate inputs, the lack of skilled workers, and corruption as the other top obstacles. Informal firms more frequently cited crime, a limited market size, and access to inputs.

The lack of a highly skilled workforce is a more binding constraint for the most productive firms, according to analysis of the INE-WB survey (2023). There are some notable differences in the barriers perceived by businesses with different productivity levels. Access to finance affects all firms by similar magnitudes, regardless of their productivity level (Figure 62, Panel 1). Complaints about the competitive practices of their competitors are more frequent among the

least productive firms (panel 10), whereas the lack of sufficient clients is a more common concern among the least productive informal firms (panel 9). The difficulties posed by the limited availability of skilled workers and by corruption seem to be more prevalent among the most productive formal firms in our sample of micro and small businesses (panels 6 and 3, respectively).

Figure 62. Limited skills in the workforce and corruption may be more binding constraints for the most productive firms

Principal obstacles according to micro and small firms, according to quartile of productivity
Positive responses in each category, percent of firms

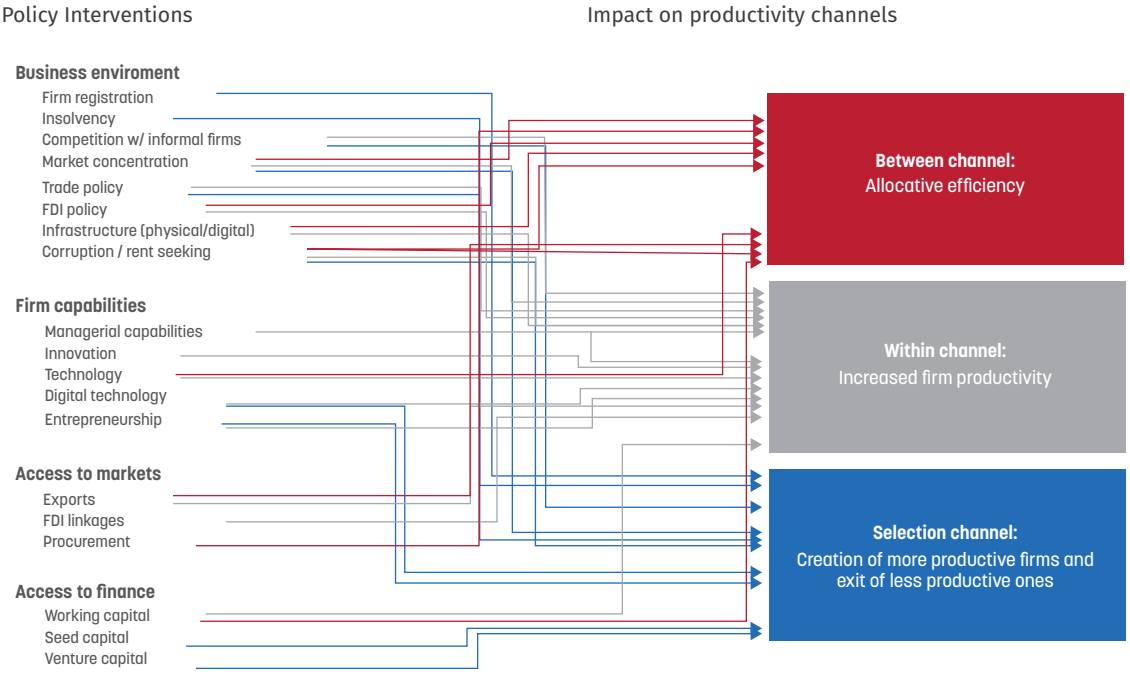


Source: INE-WB (2023) survey of micro and small firms in Asunción and Central.
Note: Conditional on sector and region. The figure does not report obstacles with less than 40 responses, since the breakdown by productivity quartiles yields several empty cells.

How can public policies support a more productive private sector in Paraguay?

Government policies can help Paraguay reach greater formalization and higher productivity. To boost private sector productivity and hence create more 'good' jobs, Paraguay can take action to (i) improve the business environment; (ii) build the human capital of entrepreneurs and improve firm capabilities; (iii) expand access to global and domestic markets; (iv) make finance more easily accessible to both existing firms and fledgling entrepreneurs. Improvements in these areas can increase productivity growth through one or more channels (Figure 63).

Figure 63. Policy interventions to support firms may affect productivity through more than one channel



Source: World Bank staff.

Improve the business environment for formal firm entry, expansion, and exit

Paraguay has made remarkable progress in simplifying procedures to start and register a formal business. By creating a new type of corporate entity called *Empresas por Acciones Simplificadas (EAS)*, or simplified joint stock company in 2020, Paraguay managed to reduce the average time taken to start a (formal) business from 35 days in 2018 to 5 days in early 2023. EAS enables entrepreneurs to register their business mostly online, reducing the number of physical visits required to multiple agencies to a single visit to a 'one stop shop' for registration. Additionally, it has reduced the costs of registering by making notarization optional. As of early 2024, there were more than 7,000 EAS firms.

While EAS is a step in the right direction, the government could increase outreach around the benefits of the scheme and target informal firms with greater probability of formalization. Among the informal businesses interviewed in the INE-WB survey in March 2023, only 5 percent of interviewees were familiar with EAS. While this is understandable given that EAS was launched during the COVID-19 pandemic, the Ministry of Industry and Commerce (MIC) could redouble its efforts to communicate the benefits of the plan, or make it more attractive. For example, it could improve coordination between EAS and the banking system and the simplified tax regime (Feal-Zubimendi and Ventura 2023), or package EAS together with information on access to finance, setting up a corporate bank account or other types of business training. Such combined interventions have been found to be effective in Malawi (Campos et al. 2023) and Benin (Benhassine et al. 2018), although care needs to be taken to ensure that the costs of implementation do not exceed the benefits to firms, as they did in the

latter case (Benhassine et al. 2018). A strategy for Paraguay could be to target more productive, mature informal firms which are more likely to see the benefits of registering, although this would require better data on firms. This type of information could guide the design of incentives to accelerate the formalization of workers, such as the government's proposal to formalize those dependent on MSMEs and self-employed workers.

Efforts have also been made to make it easier for bankrupt firms to exit, but these have not borne fruit. The current legal framework puts financially distressed Paraguayan companies at risk of liquidation, as the antiquated proceedings of the Bankruptcy Law No. 154/69 do not allow for the restructuring and rescue of viable companies in severe financial difficulties, nor for satisfactory results to be obtained to pay off the creditors' claims. While the government had submitted a bill based on international best practice to replace the obsolete Bankruptcy Law in 2020, it was rejected by Congress.[73] The proposed bill would have made it possible to prioritize restructuring over liquidation of financially distressed firms. This move would better protect the interest of creditors and debtors, in addition to protecting jobs, increasing confidence in credit providers, and preserving sources of tax revenue. Other planned institutional reforms in the judiciary and pertaining to bankruptcy trustees, which are essential to implement modern insolvency legislation effectively, have also been delayed. The government intends to resubmit a new insolvency bill draft to Congress by June 2024 (IMF 2024).

Strengthen firm capabilities

To boost productivity within firms, Paraguay could provide more proactive support to strengthen the capabilities of firms. Worldwide, business training programs have been found to increase profits and sales by 5 to 10 percent (Mckenzie 2021). In Paraguay, about 80 percent of the micro and small firms in Asunción and Central regions surveyed by INE and WB indicated interest in receiving more support from the government on how to expand their businesses. There was no statistically significant difference between formal and informal businesses. This suggests a large, unmet demand for such training, even though MIC and MTESS already offer online and in-person courses through the *Servicio Nacional de Promoción Profesional* (National Professional Development Service or SNPP) and the *Sistema Nacional de Formación y Capacitación Laboral* (National System for Vocational Education and Training or SINAFOCAL). The government may therefore want to evaluate whether the content and modality of these existing offerings are adequately meeting the needs of different types of firms. For example, female-owned businesses, which tend to lag in productivity and in registration, may need more tailored assistance.

Similarly, government spending in innovation needs to be evaluated.[74] While Paraguay lacked programs supporting science, technology, and innovation (STI) before 2007, public investment in STI has increased to about USD 16 million or 0.04 percent of GDP annually, enabling increases in the number of patents, researchers per capita, and Scopus publications (Torrico and Ventura 2022). However, it is unlikely that these improvements have led to

[73] The bill was rejected due to the misperception that the law would have forced debtors to liquidate their assets quickly and on a large scale.
[74] Although we refer to innovation as a unique activity, the Oslo Manual defines four subtypes of firm-level innovation: product, process, marketing, and organizational innovation; see Cirera and Maloney (2017) for details.

increases in innovation or technology adoption by firms, in part because there is a gap between research and development and getting the product to market. In particular, the effectiveness of innovation policy is affected by strong complementarities between a firm's managerial and technological capabilities, which suggests a rebalancing of R&D spending vis-à-vis management and technological extension programs.[75] The government could consider conducting a public expenditure review of STI spending to assess their effectiveness and consider other instruments such as R&D subsidies. An evaluation of STI policies in the region suggest that many such programs lack a theory of change and are poorly managed/monitored (Cirera and Maloney 2017). More broadly, to encourage innovation, the government could also strengthen intellectual property rights protection, and encourage more collaboration and networking among firms, industry associations, research institutions, and academia.

Expand access to markets[76]

Implementing trade facilitation measures would significantly reduce the burdens faced by all firms, especially exporters. First, to reduce trade costs, Paraguay could streamline and enhance the administration of Non-Tariff Measures (NTMs) by conducting regulatory impact assessments before implementing new or existing NTMs, such as prior import licenses, and by automating the process of issuing licenses. Second, Paraguay could examine and consolidate the various fees charged on trade, including consular fees, and develop a medium-term plan to streamline them. It could, for example, replace ad-valorem fees with fixed charges that better reflect the actual cost of the provided services. Third, customs can strengthen post-clearance audit processes to decrease excessive allocation of goods to red channels and coordinate physical inspections with other border agencies. Ongoing reforms to the Customs Code to improve compliance are a positive step. Finally, Paraguay can continue to make improvements in the accuracy and scope of information it provides to traders on rates, taxes, requirements, and procedures, digitalizing forms where possible (World Bank 2022b).

Trade policy and trade facilitation reforms will have a stronger impact if complemented with initiatives to strengthen export capabilities of firms, especially of new exporters. Reaching new markets also requires financing and insurance schemes, investments in certifications and compliance with international regulations, and export assistance programs that offer export training, market intelligence, and export promotion services. Given the low survival of exporting firms in Paraguay,[77] REDIEX, the export and investment promotion agency, can establish learning exchanges with other export agencies that have successfully implemented such training programs (World Bank 2022b). Such programs need to include digital skills and support on aspects of digital commerce to facilitate digital trade, which could be a gamechanger for landlocked countries such as Paraguay (see Chapter 3).

[75] See the discussion by Cirera and Maloney (2017).
[76] Section based on World Bank 2022b.
[77] World Bank analysis shows that less than half of exporting firms in Paraguay continue exporting after their first years of exports, and less than 30 percent survive after five years. Source: World Bank (2022b), see page 34.

Broaden access to finance

A well-functioning financial sector plays a critical role in allocating capital efficiently and promoting the expansion of existing businesses and supporting the creation of new firms.[78] Greater access to finance is often needed to invest in new innovative processes and support technology upgrading.[79] There is also evidence that microenterprises' access to capital offers returns that are substantially higher than interest rates and can have long lasting consequences in terms of firm survival and higher profits (De Mel et al. 2008, 2012). To expand access to finance in Paraguay, particularly among MSMEs, the government could:

i. *Address information failures* that increase the cost of capital and exclude creditworthy firms from financial resources — e.g., by developing MSMEs' financial accounting capabilities, introducing cloud-based accounting, or incentivizing the uptake of e-invoicing.

ii. *Strengthen credit infrastructure.* Credit information bureaus, the use of alternative collateral, and mechanisms for credit scoring of firms without credit history are vital to deepen access to finance, especially at start-up stage.[80] Specific actions could include incorporating information from financial cooperatives in the credit registry and creating a movable collateral registry. Enacting the draft law on collateral of movable assets (submitted to Congress in December 2022) would promote greater flexibility and scope for MSMEs seeking lower-cost credit.[81]

iii. *Expand the range of financial services* through non-banking financial institutions, microfinance institutions, and fintech companies. For example, authorities could consider adopting mechanisms to facilitate wholesale funding to fintech companies, as well as adopting good practices in the regulation of microcredit and loans.

iv. *Explore the possibility of scaling up partial credit guarantees.*[82] In particular, the government could assess how to build on the experience of FOGAPY, a partial credit guarantee program which expanded during COVID-19 but was only recognized by a quarter of respondents to the INE-WB (2023) survey.

Build a solid institutional framework

The effectiveness of government interventions to support firm and productivity growth hinge on a solid institutional framework. Given the limited fiscal resources in Paraguay, it is essential that public policies supporting firms are anchored in a solid institutional framework and informed by evidence on their effectiveness. Such a framework would also mitigate the risk of capture of the policy process by special interest groups, as well as improving coordination among public

[78] The discussion that follows comes from a background note authored by Smith (2021) for the 2022 World Bank Payment Aspects of Financial Inclusion (PAFI) diagnostic for Paraguay.

[79] Increased investment in innovation and technological development exhibits positive impact on firm growth and labor productivity. See Benavente et al. 2007; Crespi et al. 2011; and Tinajero and Lopez-Acevedo 2010.

[80] Credit infrastructure such as credit bureaus and collateral registries can improve SMEs' access to finance and have a positive effect on firms' growth and productivity (Ayyagari et al. 2016; Campello et al. 2016; Ghassibe et al. 2019).

[81] Information alone may not be sufficient to improves access to capital and should be complemented by improvements in credit bureaus and innovative loan products (De Mel et al. 2011).

[82] Partial credit guarantees facilitate firms' access to credit and growth in output and employment and has a positive impact on productivity over time (Arráiz et al. 2014; Bertoni et al. 2018).

agencies and with the private sector. To develop evidence-based policies Paraguay will also need to collect more regular and comprehensive firm-level statistics and put in place a system of continuous monitoring and evaluation that can be used to correct the path when necessary. In this context, the collaboration between MIC, DNIT, INE, and IPS to combine administrative databases and to publish the *Boletín de Formalización de MIPYMEs* (Bulletin on the Formalization of MSMEs) (Rivas et al. 2022), as well as to strengthen the *Observatorio de MIPYMEs* (MSMEs Observatory), are important steps. Utilizing this data to analyze firm productivity dynamics, and eventually building a single registry of administrative data on firms — with the appropriate safeguards for confidentiality and transparency — could help improve the formulation of public policies to support firms.

Table 1. Policy recommendations to incentivize productivity growth and the formalization of firms

Challenge	Recommendation
Make the business environment more conducive for firm entry, growth, and exit	Increase awareness of the EAS initiative and consider offering a combined package of interventions to high-potential informal firms
	Enact legal reforms to modernize the insolvency framework
	Strengthen the enforcement of competition policy and intellectual property rights protection
Strengthen managerial capabilities of firms and their ability to innovate/adopt new technologies	Review the effectiveness of current training programs and consider better targeting in their design
	Review the efficiency and effectiveness of existing government spending on science, technology, and innovation
Expand access to markets	Facilitate trade including by streamlining non-tariff measures, strengthening the customs code, and improving information available to traders
	Strengthen export assistance programs
Broaden access to finance for firms	Address information/capacity gaps, e.g. in accounting and e-invoicing
	Expand the range of financial services through non-banking financial institutions, microfinance, and fintech
	Strengthen credit infrastructure including by accelerating the enactment of the law on collateral of movable assets
Strengthen the institutional framework for decision-making on public policies to support firms	More regularly collect data on firms and use it to inform the design of policies and programs that support their growth
	Create a single registry of firm administrative data
	Systematically monitor and evaluate firm support policies

Chapter 3 — Can services drive growth and development in Paraguay?

Key messages

- The services sector generates half of Paraguay's value added and employment, but most of the jobs created are informal. There is room to expand the contribution of services to the growth of exports and productivity, especially given that Paraguay is a landlocked country.
- Improvements in digital skills, greater fixed broadband penetration, and data protection policy would increase the contribution of ICT to productivity growth.
- (Eco)tourism could contribute to local economic growth and jobs, but the sector would need improvements in infrastructure, skills, and a clearly defined value proposition.
- To harness the potential of services for growth and development, a more strategic view of the sector and reforms to improve the regulatory/institutional environment are needed.

Why services?

Services, not manufacturing, has driven growth and job creation in Paraguay. While manufacturing has traditionally been the escalator to growth and greater prosperity, this has not been the case in Paraguay, nor in most LAC countries. In 2022, manufacturing made up 20.9 percent of GDP, 10.3 percent of total employment, and 17 percent of merchandise exports,[83] shares that are largely unchanged over the past two decades. Non-agricultural exports from *maquila* firms have grown by double digits during recent years, but even so only represented 10.4 percent of total exports in 2022. By contrast, the services sector has driven growth and job creation over the past two decades.

This chapter explores Paraguay's potential to leverage the services sector for faster, more inclusive, and resilient growth. Part 1 establishes trends and patterns in the services sector; Part 2 explores what is holding services exports and productivity back by examining the constraints in the telecommunications and tourism sectors as examples. Part 3 concludes with recommendations on how Paraguay can leverage services to diversify its sources of growth. The question is not whether Paraguay should focus on developing manufacturing *or* services, but rather how to leverage services to support growth in other sectors, as well as to diversify the export base (Box 9).

[83] The data on GDP and employment are from the BCP and INE, respectively. The export figure comes from the World Bank WDI.

Box 9. Can the services sector drive growth and development in Paraguay?

Accelerating services' productivity and growth could benefit Paraguay in two ways. First, providing access to good-quality and reliable services is key for the growth of all economic sectors. For example, services can be embodied as inputs (e.g. design, logistics, e-commerce) or as postproduction complements (e.g. warranties, after-sales support, marketing services), thus increasing the value added of manufactured goods (Arnold et al. 2008, 2011, 2013; Vandermerwe and Rada 1988). In Paraguay, logistics and storage services also play a key role in agriculture value chains. Access to good quality services such as education, health, water, sanitation, electricity, and the Internet is also crucial to the productivity of all firms and workers.

Second, increasing exports of services could make growth more resilient. An open, competitive, and modern services sector can help to mitigate the effects of climate change on exports. Services have lower elasticity of demand in export markets and could hence be less vulnerable to export shocks (Ariu 2016). Some emerging economies such as India and the Philippines have become world-class exporters of ICT and business services, while others, including Paraguay's 'aspirational peers',[84] have successfully developed tourism. Tourism can be an important source of employment and income in and around protected areas (Buckley and Coghlan 2012, World Bank 2021c), as they generate spillovers by improving access to infrastructure and reducing trade costs for local manufacturing industries (Faber and Gaubert 2019).

However, countries that have increased services exports have not necessarily seen a meaningful reduction in poverty. This is because tradable services such as finance, ICT, and business services disproportionately employ high-skilled workers (Amoranto et al. 2011; De and Raychaudhuri 2008; Mehta and Hasan 2012). In India, for example, productivity growth in non-tradable consumer services contributed a third of overall welfare improvements between 1987 and 2011, but disproportionately benefited wealthy individuals in urban areas (Fan et al. 2023). Overall, ensuring universal access to good quality services is crucial to making services work for faster, more inclusive, and resilient growth.

Source: Based on Nayyar et al. (2021).

Services generate half of value added and jobs, but contribute little to productivity and exports

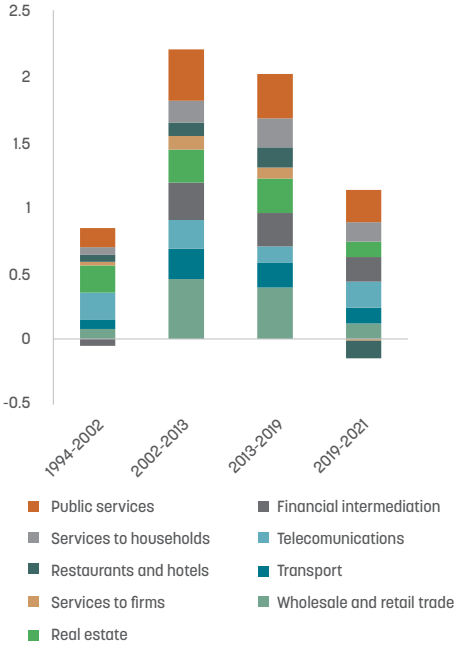
The services sector creates more than half of value added in Paraguay. Between 2002 and 2022, services value added grew at 4.0 percent per annum on average, outpacing the primary sector (3.5 percent) and the secondary sector (3.0 percent).[85] The share of services in total value added thus increased from 49 to 54 percent. More than half of the growth in services was driven by non-tradable sectors, especially wholesale and retail trade and services to households[86] (Figure 64).

[84] Croatia, Costa Rica, Uruguay, and New Zealand. See Chapter 1 on how these were selected.
[85] Measured by the compound annual growth rate, using BCP data.
[86] *Tradable services* encompass transport, storage, communications, financial and professional services. *Non-tradable services* are wholesale & retail trade, hotels and restaurants, public and domestic services, and real estate.

The services sector has created the most jobs, especially for women. As of late 2022, 64.6 percent of total workers are employed in the services sector, principally in the wholesale and retail trade and household services. In the last two decades, the sector accounted for three-quarters of all new jobs created (Figure 65). Services are a particularly important job creator for women: during that period, six of every 10 new workers in the services sector were women.[87]

Figure 64. Non-tradable service activities have driven growth in the services sector...

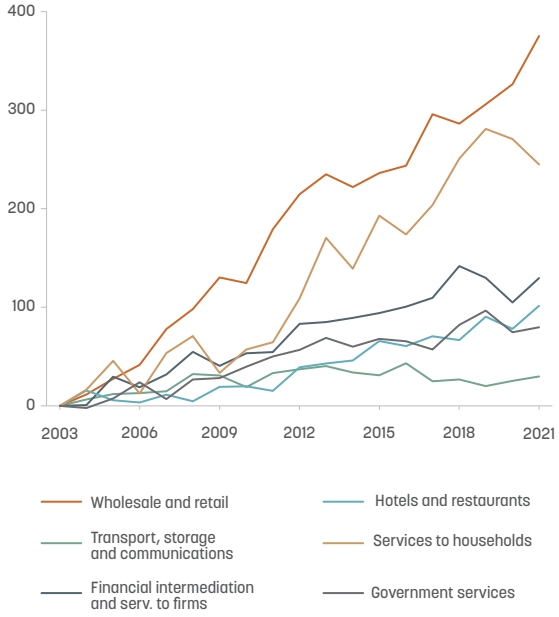
Average contribution to services value added real growth, percentage points



Source: BCP

Figure 65. ...and created the most jobs, absorbing mostly low-skilled workers.

Change in number of workers from 2003 (in '000s)



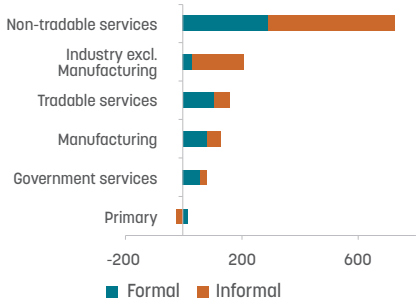
Source: EPH 1997/98 — 2016, EPHC 2017 — 2021.

Most of the jobs in the services sector are not formal and pay little. Out of the 1 million jobs created by the services sector over 2003-2021, half were informal in nature, especially in non-tradable services sectors (Figure 66). Many of these jobs pay median hourly wages lower than the manufacturing sector, with some exceptions (Figure 67). The magnitude of this wage dispersion within the services sector, however, is in line with other middle-income countries (Nayyar et al., 2021).

[87] Own calculations using EPHC data.

Figure 66. Most of the jobs created in services are informal...

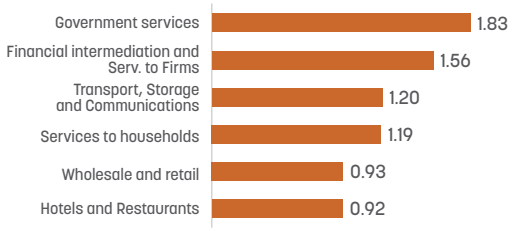
Change in the number of formal and informal workers by sector, 2003-2021



Source: EPH 1997/98-2016, EPHC 2017-2021.
Note: Formal workers are defined as someone who has a retirement plan, or insurance, or both.

Figure 67. ...and pay less than the manufacturing sector, with some exceptions.

Real median hourly income as a share of real median hourly income in the manufacturing sector

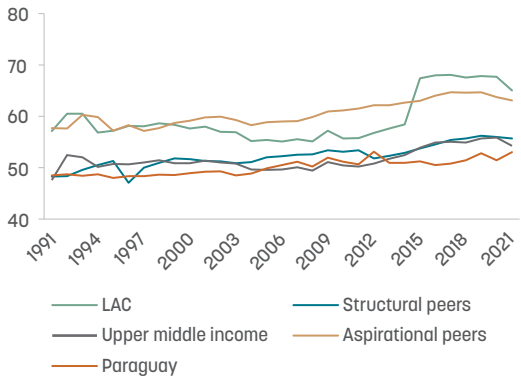


Source: Staff calculations using EPH/EPHC 2017-2021 and BCP data.

Compared to peers, the services sector in Paraguay is less productive, but there are significant variations within the sector. Despite the rise of services, its share of total value added in Paraguay is lower than in all peer groups (Figure 68), in part because services value added expanded at a slower pace.[88] However, the importance of services in total employment is higher in Paraguay than for the average UMIC and for some peers (Figure 69). This points to the generally low-productivity nature of the sector, measured by the value added per worker (Figure 70). Nonetheless, labor productivity varies across subsectors: the value added per worker of transport, storage, and communications is 30 percent higher than manufacturing, while wholesale and retail trade and services to households are between some 77 and 87 percent less productive (Figure 71). The labor productivity of these sectors is even lower than agriculture.

Figure 68. The share of services in total value added is lower in Paraguay than in peers...

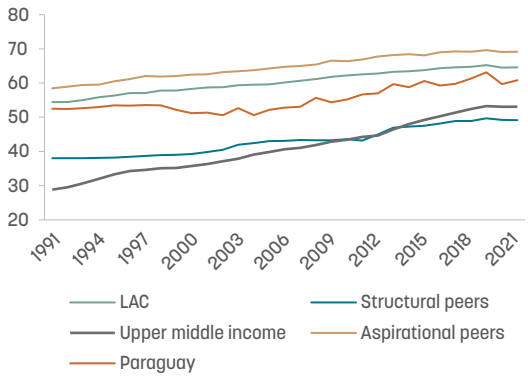
Services value added (% of GDP)



Source: BCP and WDI.

Figure 69. ...but the share of services in total employment is higher.

Employment in services (% of total employment)

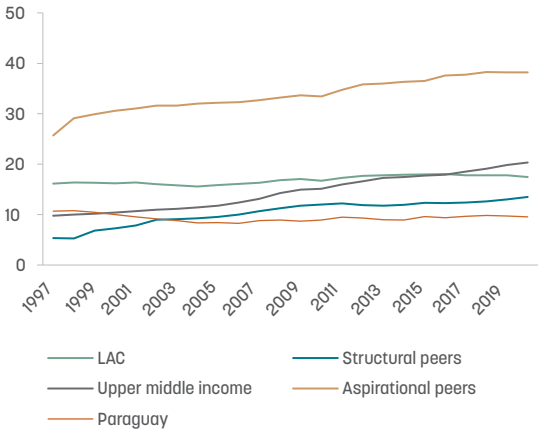


Source: WDI

[88] 3.3 percent versus the 4.8-4.9 percent average for structural and aspirational peers.

Figure 70. Services labor productivity has remained low compared to peers...

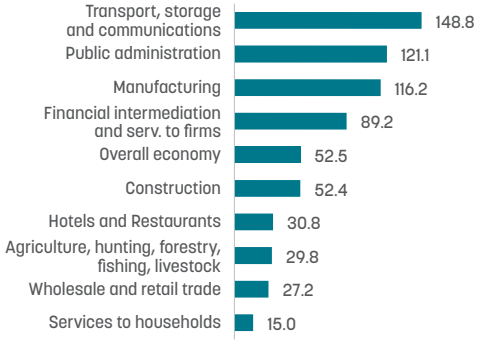
Services value added per worker (constant 2015 USD)



Source: Staff calculations using WDI.

Figure 71. ...but some tradable services are more productive than manufacturing.

Value added per worker (millions of 2014 Guaraníes)

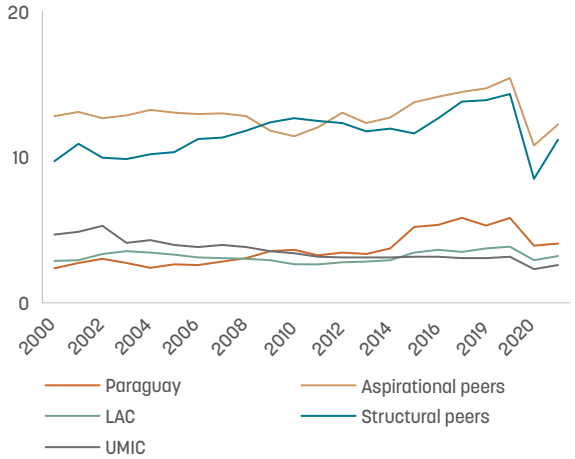


Source: BCP and EPHC.
Note: Data refer to 2021. Utilities are excluded

Services exports are a small fraction of total exports, but some tradable segments show promise. Paraguay's services exports reached USD 2.155 billion in 2022, equivalent to 5.1 percent of GDP or 14.4 percent of total exports. These shares are below structural and aspirational peers, where services made up between 10 and 18 percent of GDP (Figure 72), or between 28 and 46 percent of total exports. In Paraguay, goods-related services, driven mainly by the assembly activities of maquila firms, drove much of this increase (Figure 73). However, transport and travel services have also grown rapidly between 2005 and 2021, principally before the pandemic.

Figure 72. Paraguay's services exports lag peers

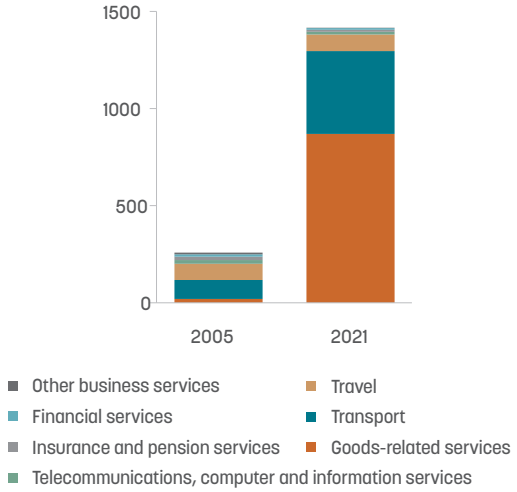
Services exports as a share of nominal GDP, percent



Source: Staff calculations using UNCTAD via WDI.

Figure 73. Exports of ICT, finance, insurance and business services are minimal

Services exports in constant USD million



Source: Staff calculations using UNCTAD via WDI.
Note: Goods-related services are manufacturing services on physical inputs owned by others (e.g. processing, assembly, labelling, packing) and of maintenance and repair services.

More 'modern' or innovative service exports have room to grow. According to IMF data, Paraguay's exports of ICT services made up just 0.9 percent of total services exports in 2022, below the averages for the LAC region (8.5 percent), structural peers (14 percent), and aspirational peers (17 percent). Similarly, insurance and financial services made up just 3 percent of total services exports — less than half of the regional average and behind structural peers.

Services can also indirectly contribute to exports to a greater extent. In 2014 (most recent available data), services accounted for only 12 percent of the gross value of Paraguay's exports, below the averages for all other peer groups (20 to 32 percent, see Figure 74). However, when including the value added of services in exports from intermediate inputs and services bundled with goods, this number rises to 33 percent. This is on par with LAC and UMIC peers, although below aspirational and structural peers (Figure 75). Distribution services account for almost half of this indirect contribution.

Figure 74. Services exports are a small fraction of Paraguay's total exports...

Share of each sector in total exports based on the gross value of exports, percent

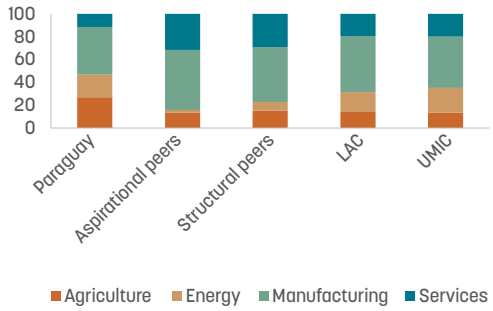
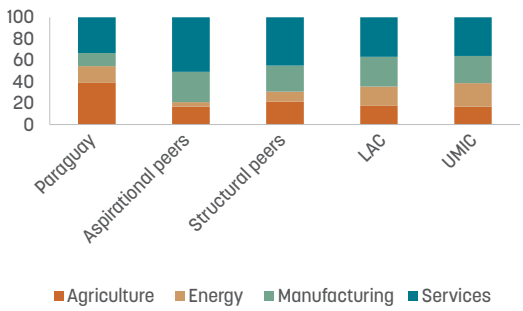


Figure 75. ...but contribute more indirectly.

Share of each sector in the value added of exports based on forward linkages, percent



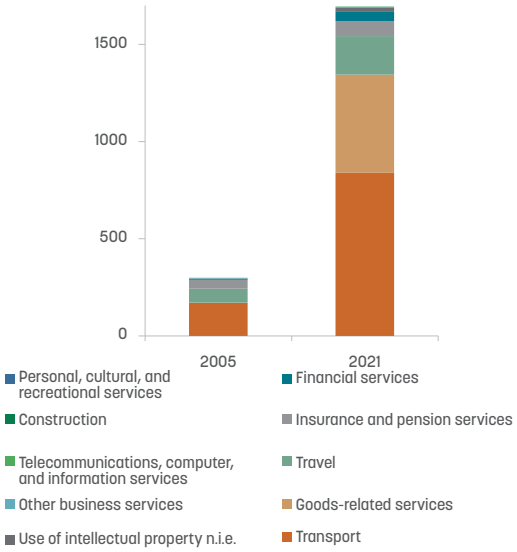
Source: World Bank Export of Value Added Database (World Bank 2014; latest data available).

Services imports have also expanded. Like services exports, services imports almost quadrupled in constant US dollars between 2005 and 2021, mostly explained by goods-related and transport services. There has been a shift from trade in services from Mode 1 (cross-border trade) to Mode 3 (commercial presence), consistent with an increase in services FDI.

Boosting the productivity of services firms, regardless of whether they export or not, could increase the sector's contribution to growth and job creation. Countries that experience faster growth in exporting services tend to create more jobs (Loungani et al. 2017). This is indeed the case in Paraguay: according to 2017 WBES data, exporting services firms experienced nearly 20 percent growth in sales and employment between 2010 and 2017, versus only 2-3 percent for non-exporting services firms (Patiño Peña 2022). However, improving the allocation of resources across services firms, regardless of export activity, would boost productivity. In fact, a better allocation of resources across non-exporter services firms drove growth in services productivity between 2010 and 2017 (Patiño Peña 2022).

Figure 76. Services imports have also expanded...

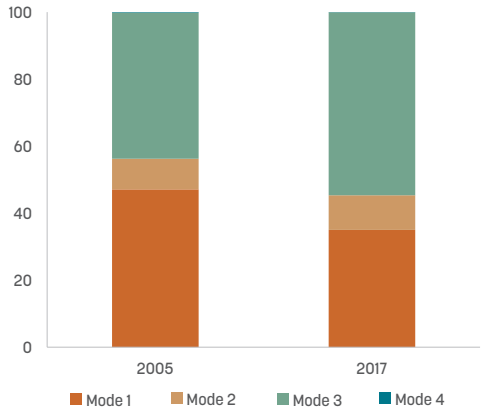
Services imports in constant USD million



Source: Staff calculations using UNCTAD via WDI.

Figure 77. ...mostly through the commercial presence of suppliers.

Share of each supply mode in total services imports, %



Source: WTO TISMOS database.
Note: Latest data available.

Constraints in expanding the contribution of services to growth and development

Paraguay faces several challenges when it comes to expanding the contribution of services to exports, productivity, and job quality. These are:

- *Improve the quality of human capital.* Many services sectors, especially tradable ones, are more skill-intensive than many goods industries (van der Marel 2012). Human capital endowments are therefore critical to services exports. However, according to the World Bank Human Capital Index (World Bank 2021b),[89] children born in Paraguay today will only be 53 percent as productive as they could be when they grow up if they had complete access to good quality education and health, a worse performance than the average LAC country (see Chapter 1). Education outcomes drive this performance: the World Bank estimated that 77.7 percent of 10-year olds in Paraguay cannot read and understand a simple text by the end of primary school, a bit below the regional average of 80 percent. Indeed, the limited availability of skilled workers is one of the top three constraints cited by more productive formal firms interviewed in the WBES as the main obstacle to growing their businesses in Paraguay (see Chapter 2).
- *Promote regulations that facilitate the movement of factors across borders.* While Paraguay has relatively few restrictions on services trade and an open investment regime, some remaining restrictions may limit market contestability and drive prices up

[89] The HCI has five different sub-indicators: survival rate through age 5, stunting rates by age 5, adult survival rate, expected years of schooling and harmonized learning outcomes.

(World Bank 2022b). For example, the entry of professionals is limited not only by the need to obtain authorization from public authorities (accountants, lawyers, notaries, and architects) or professional bodies (engineers), but also by the quasi-exclusivity of certain tasks, which are not all strictly necessary to protect the quality of services.[90] Price regulations are in place for several professional services such as activities conducted by lawyers and notaries.

- *Increase competition between firms.* Strong domestic institutions and rule of law are an important factor when it comes to the growth of more 'modern' services. Despite improvements, Paraguay has an opportunity to strengthen the capacity of the state to enforce competition rules that ensure a level playing field for all firms. There is some indication that there is more limited competition in the services sector, where average price-cost margins increased between 2010 and 2017 (World Bank 2022b). The lack of competition in key network industries such as electricity, water, and telecommunications could also be affecting the competitiveness of downstream industries.

These challenges are illustrated concretely below through the examples of the ICT and tourism sectors.

Gaps in connectivity and skills prevent greater adoption of ICT by workers and firms

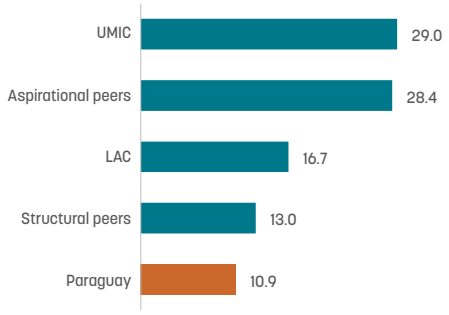
Technology can be a gamechanger for the Paraguayan economy. Digital platforms have reduced the importance of physical proximity, creating new opportunities for Paraguayan firms to access new markets. This is particularly important for Paraguay given its landlocked and remote location. Technology can also boost firm-level productivity by automating business processes and by diffusing computer-related software and data. In Brazil, Senegal, and Vietnam, firms that utilize general purpose technologies for inventory management, pricing, accounting practices, marketing, and payment are more productive than those that do not (Cirera et al. 2020). In addition, Paraguay could increase its exports of ICT services, following in the footsteps of Uruguay and Costa Rica. This is a more aspirational goal that would contribute to export diversification and hence to more resilience.

A first step to realizing these goals is to increase the penetration of fixed broadband Internet in Paraguay. While a rapid diffusion of mobile broadband has led the share of the population using Internet services to jump from 37 percent in 2013 to 76 percent in 2022, closing the gap with most peers,[91] access to fixed broadband Internet — a more reliable and rapid connection than mobile broadband — is still lagging. Despite significant advances, only 11 percent of the population had a fixed broadband subscription in 2022, a lower share than peers (Figure 78). Moreover, there are wide gaps in access between urban and rural areas[92], schooling levels, and age. Price is a key constraint: despite improvements, prices remain above the recommended ceiling of 2 percent of monthly income (Figure 79) and are even more unaffordable for low-income individuals.[93]

[90] For instance, certain tasks exclusively performed by notaries could be carried out by lawyers, which would enhance competition and service availability.
[91] International Telecommunication Union (ITU) World Telecommunication/ICT Indicators Database.
[92] Only 22 percent of households in rural areas have access to the Internet at home, versus 75 percent in urban areas (INE 2023).
[93] While the cost of fixed internet represents only 1.5 percent of average monthly income for the highest income quintile, it is 10 percent for the lowest income quintile. Source: ITU.

Figure 78. Only a tenth of the population has access to fixed broadband Internet services

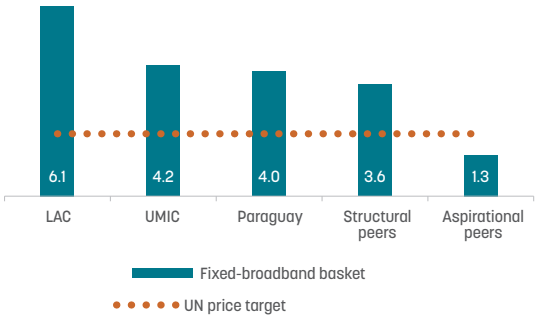
Percent of population



Source: ITU via WDI, staff calculations.

Figure 79. Fixed broadband Internet prices are high relative to most peers and to the UN target

Fixed broadband basket as percent of monthly GNI per capita (PPP)[94]



Source: ITU 2022.

Restrictions inhibiting a more competitive market may be keeping fixed broadband prices high. Landlocked countries face natural disadvantages in providing affordable Internet services as they lack direct access to undersea cables and thus need to incur additional costs.[95] However, in the case of Paraguay, stringent licensing requirements may also be making it more difficult for new firms to enter the fixed broadband market. For example, regulators can set limits on the number of permits that can be issued, and there is no mandatory access to key passive infrastructure such as poles and ducts, which could be shared across operators to bring down the cost (World Bank 2022b). As such, most investment in fixed broadband continues to be made by the loss-making state-owned *Corporacion Paraguaya de Comunicaciones* (COPACO), whose profits have declined significantly in recent years.

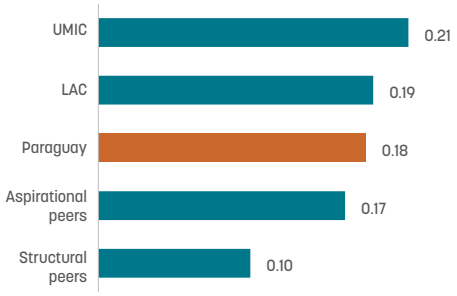
Short spectrum licensing terms may also be hobbling private investment. Paraguay has allocated spectrum for mobile services for a total of 350 MHz, lower than the regional average of 472 MHz. Allocating more spectrum for mobile broadband services would allow better service coverage and speeds through competitive forces. However, Paraguay only awards spectrum licenses for five years, well below the regional average of 16 years, increasing the risks for operators and potentially reducing the incentives to invest (GSMA 2018). In this context, the Paraguayan government's recent attempts to extend spectrum licenses to 20 years are welcome.

The regulatory regime for digital services trade is open but can be improved. Between 2014 and 2022, Paraguay's score on the OECD Digital Services Trade Restrictiveness Index[96] improved from 0.22 to 0.18 (Figure 80) due to three improvements: (i) it aligned national contract rules for cross-border transactions with international standardized rules,[97] (ii) made online tax registration and declarations available to non-resident foreign providers, and (iii) passed

[94] ITU defines fixed broadband basket as "the cheapest plan providing at least 5 GB of monthly high-speed data (≥ 256 Kbit/s) from the operator with the largest market share in each economy."
[95] See World Bank (2016) World Development Report, pages 212-213.
[96] The index is a measure of constraints that affect digitally-traded services: infrastructure and connectivity, electronic transactions, payment systems, and intellectual property rights.
[97] This occurred as Paraguay signed the UN Convention on Electronic Communications in International Contracts.

new legislation that facilitated electronic transactions. While on par with LAC and aspirational peers, Paraguay's score still lags structural peers (Figure 80). One of the factors could be that Paraguay still requires businesses to establish a local presence[98] to provide digitally-enabled services — an outlier in the LAC region (Loria Obando et al. 2022).

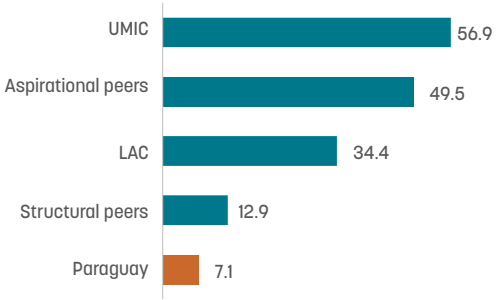
Figure 80. Digital services trade could be more open
Digital Services Trade Restrictiveness Index (0 to 1)



Source: OECD 2023.
Note: 0 refers to a fully open digital services regime and 1 is a fully closed one.

The implementation of personal data protection measures could strengthen trust in digital platforms. In a recent INE and World Bank survey of micro and small firms in Paraguay (see Chapter 2), the main reason cited by respondents who did not conduct any sales through any kind of digital platform[99] was not a lack of knowledge, but that it was not necessary. This suggests that there could be constraints on the consumer demand side for e-commerce, such as low trust or awareness. Indeed, Paraguay is one of the few countries in the region/world without a specific law on personal data protection[100] (Loria Obando et al. 2022). While the use of digital merchant payments has been growing rapidly, in 2021 only 7 percent of the working-age population has used a mobile phone or the Internet to make payments, buy things, or to send or receive money using a financial institution account[101] (Figure 81). The rapid approval of the Personal Data Protection law, which is in the Congress, would be an important step to boost consumer trust.

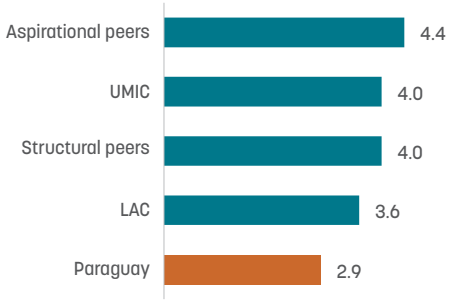
Figure 81. There is room to grow the use of digital payments...
Share of working-age population who has used a mobile phone or the Internet to make payments, buy things, or to send or receive money using a financial institution account, percent



Source: Demirgüç-Kunt et al. 2022.

Figure 82. ...and to improve digital skills of the workforce.

Digital skill adequacy assessed from 1 = not at all, 7 = to a great extent[102]



Source: WEF 2019.

[98] This means that foreign companies must establish a domicile in Paraguay or appoint a legal representative domiciled in the country to provide a telecommunications service.
[99] This includes websites and social media (including Whatsapp).
[100] A bill has been under discussion in Congress since 2021, but there has been little progress to date. In October 2020 regulations limited to credit information were approved, but these imply that cross-border data transfers are subject to approval on a case-by-case basis.
[101] According to data from the Global Findex (World Bank 2021d). Face-to-face surveys were conducted with 1,000 respondents from September 1 to November 11, 2021.
[102] Number refers to the average answer to the question: "In your country, to what extent does the active population possess sufficient digital skills (e.g. computer skills, basic coding, digital reading)?"

A strategy to improve digital skills would allow for a more productive use of the Internet. To fully leverage the job creating and productivity-enhancing potential of digital technologies in the services sector, individuals need to have the necessary knowledge and skills to take advantage of them. In that regard, executive opinion surveys by the World Economic Forum (WEF) suggest a deficiency of digital skills in Paraguay relative to peers (Figure 82). In addition, in 2022, only 20.8 percent of respondents to household surveys stated that they use the Internet at their workplace, and most used the Internet only for recreational purposes.[103] Future generations of workers are not being sufficiently equipped with digital skills: only 18 percent of public schools in Paraguay are estimated to be connected to the Internet via fiber-optic cable (World Bank 2023b).

The use of ICT for business innovation has room to evolve. According to the WBES, most services firms in Paraguay have their own website and use emails to interact with clients/suppliers (72 and 82 percent respectively, above the average for UMIC). This is corroborated by the recent 2023 INE-WB survey in Asunción and Central, where most services firms, even informal ones, indicated that they conducted sales over digital platforms (websites or social media). However, Paraguay continues to rank below the LAC average in metrics pertaining to digital innovation, including R&D expenditures and the share of ICT service imports. High-technology exports as a percentage of total manufacturing exports stagnated at around 9.7 percent between 2008 and 2018. Only 7 percent of formal firms use technology licensed from foreign companies.

A higher usage of ICT and data could stimulate growth of less-established sectors such as tourism. Digital platforms are particularly groundbreaking for 'unknown' destinations such as Paraguay, as they can help small tourism businesses access a global market, vastly expanding their prospects. By lowering the monetary and non-monetary costs of travelling, they can boost tourism — especially in niche segments such as nature or adventure-based tourism (López-Córdova 2020). Additionally, social media, and in particular user-generated content, offers Paraguay an opportunity to advertise itself as a tourist destination. However, Paraguay currently ranks 89 out of 117 countries (1 = best, 117 = worst) on the "ICT readiness" dimension of the 2021 Travel and Tourism Development Index (WEF 2022), indicating incipient use of digital platforms by local providers. The next section discusses constraints in boosting tourism-related services exports from Paraguay.

Institutional, infrastructure, and skills gaps constrain the potential of (eco)tourism[104]

So far, neither international tourism nor domestic tourism have experienced significant growth in Paraguay. Lacking well-defined tourism assets and with few direct air connections, Paraguay faces big challenges in developing international tourism. It ranks 99 out of 117 countries (1 = best, 117 = worst) on the 2021 WEF Travel and Tourism Development Index, below all peer

[103] The most common purposes were instant messaging (97.8 percent) and social media (84.2 percent). Only 24.2 percent used the Internet for educational or training purposes, a share that has decreased since 2015 (26.7 percent), the first year in which the survey included the question.
[104] This section is based on a background note by Villascusa Cerezo (2023).

groups.[105] International arrivals were at half of their 2019 levels in 2022, despite the absence of COVID-19 related mobility restrictions and the elimination of tourist visa fees for visitors from the United States since October 2021. Domestic tourism is also underdeveloped: Paraguay has the lowest ratio of domestic trips per capita at 0.32 trips, compared to 1.9 for aspirational and 0.39 for structural peers.[106]

Paraguay could develop a niche market for regional ecotourism and boost domestic tourism, which would create inclusive jobs and incentives to protect natural areas. Given Paraguay's rich endowment of natural capital, it could explore opportunities in eco- or sustainable tourism. When properly planned and managed, sustainable tourism can also contribute to the preservation of these natural resources by providing alternative sources of income to local populations residing in or around them. A study spanning land and marine protected areas in Brazil, Zambia, Fiji, and Nepal found that each additional dollar spent by a tourist generates substantial real-income gains (World Bank 2021c). Tourism also tends to create inclusive economic opportunities: smaller and women-owned firms are the major contributors to tourism and travel-related services activities (UNWTO 2019).

Tourism in Paraguay has the potential to boost the local economy and create jobs. In 2021, tourism only contributed an estimated 2.8 percent of GDP and 4.1 percent of employment, and 5 percent of total exports[107] — much smaller shares compared to peers (Figure 83). Tourism receipts as a share of GDP have been stagnant over the past decade (Figure 84). Although Paraguay finds itself behind with respect to overall tourism spending and average spending per arrival (Figure 85) in comparison with other peers, this presents an opportunity to develop strategies to attract a greater number of tourists and increase their spending during their time in the country (Figure 86). The low economic contribution is related to the fact that Paraguay's tourism model is anchored in 'excursionists', who make up 70 percent of total international arrivals (compared to less than 5 percent on average for peers).[108] These are primarily residents from Argentina and Brazil (making up 69 and 14 percent of total international arrivals, respectively) who are lured by favorable sales tax exemptions.[109] While this 'high volume, low value' model may have worked in the past, interviews conducted in Ciudad del Este indicate that its comparative advantage has been steadily eroded as duty-free shops have opened in Argentina and Brazil, also as the latter has increased duty-free allowances for its citizens. The excursionist model severely limits revenue generation.

[105] Among Paraguay's peers, the best performer was New Zealand (27 out of 117), followed by Croatia (46th), Costa Rica (50th), Uruguay (55th), Armenia (61st), Albania (72nd), Tunisia (80th), and Guatemala (97th).

[106] Staff analysis based on 2018 population data from World Bank WDI and domestic trips data from UNWTO.

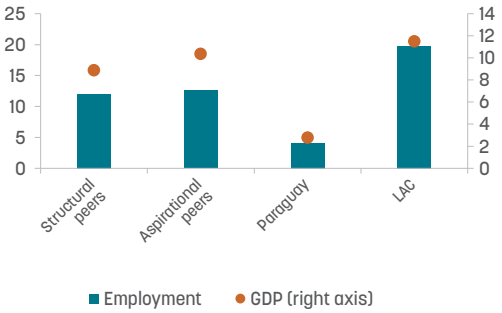
[107] According to official government statistics by SENATUR.

[108] As per the UNWTO official definition, a visitor is classified as a tourist (or overnight visitor) if their trip includes an overnight stay, or as a same-day visitor (or excursionist) if it does not.

[109] Ciudad del Este is located on Paraguay's borders with Brazil and Argentina, adjacent to the worldwide attraction of Iguassu Falls, shared by the latter two countries.

Figure 83. The contribution of tourism to Paraguay's economy is currently very low....

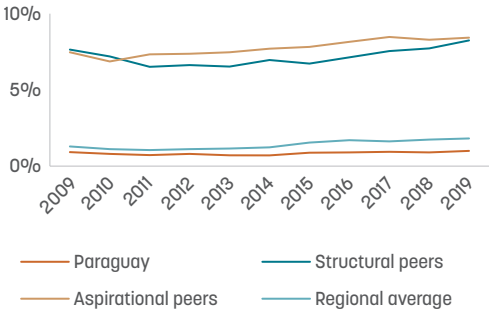
Share of GDP / employment, percent



Source: WTTC. Data refer to 2021.

Figure 84. ...and has not increased over the past two decades.

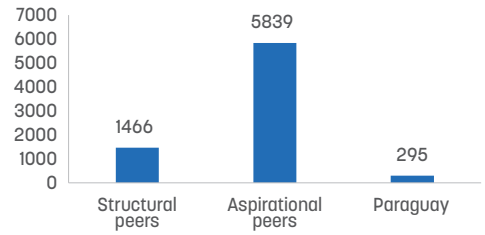
Tourism receipts as share of GDP, percent



Source: UNWTO

Figure 85. Overall spending on tourism is low in Paraguay...

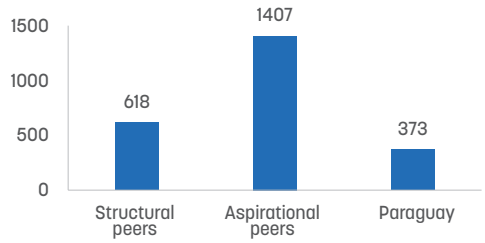
Overall tourism spending in USD million, 2009-2019 average



Source: WEF (2021).

Figure 86. ...as is expenditure per tourist arrival.

Spending per arrival in USD dollars, 2009-2019 average



Source: UNWTO

For effective planning, governance, and management, the tourism sector in Paraguay needs critical regulations. The 2005 Tourism Law established the *National Tourism System*, led by SENATUR (*Secretaria Nacional de Turismo*), along with the Tourism Promotion Fund and the National Tourism Council. However, these institutions have limited funding and an unclear legal and institutional framework.[110] Less than 40 percent of municipalities have a tourism department,[111] resulting in a lack of public services and investment. There is limited awareness of tourism's potential as a viable economic activity, and thus they do not prioritize it.

Investment in infrastructure is a key opportunity. Among all the subcomponents of the 2021 WEF Travel and Tourism Development index, Paraguay ranks among the last countries in quality of infrastructure (109 out of 117 countries on air transport and 114 out of 117 on ground and port infrastructure; see Table 2). Despite improvements, available airline seats (a measure of existing demand) are still considerably lower in Paraguay than in peers, curtailing its ability to expand to other markets. Outside LAC, Paraguay only has one direct air travel connection to Madrid. Within the country, the poor quality of existing roads and last-mile connectivity gaps with key natural assets such as the Rio Negro National Park and the Chaco Pantanal Reserve/Three Giants Biological Station make it difficult to attract more tourists.

[110] For example, the Tourism Promotion Fund is inadequately funded. The National Tourism Council, a coordinating entity with other ministries and agencies led by SENATUR, lacks a clear mandate, strong institutional framework, and regular participation of high-level government officials.
[111] Source: SENATUR Master Plan 2023-2030, p. 69.

Table 2. Paraguay scores particularly poorly on infrastructure and developing key tourism assets

WEF Travel and Tourism Development Index, 1 (worst) to 7 (best)						
	Costa Rica	Uruguay	Guatemala	Paraguay	Southern Cone average	Region average
Business environment	4	5	3.5	3.6	3.4	3.6
Safety and security	5.1	5.4	4.4	4.7	4.5	4.5
Health and hygiene	4.8	5.8	3.3	3.9	4.4	4.4
Human resources and labor market	4.6	4.4	3.3	3.6	3.9	4
ICT readiness	5.5	5.5	4.2	4.2	4.7	4.8
Prioritization of travel and tourism	4.7	4.9	4.2	4.6	4.2	4.2
International openness	4.3	3.5	3.8	2.6	3.3	3.7
Price competitiveness	4.5	4.9	5.3	5.6	5.6	5.2
Air transport infrastructure	3.2	2.6	2.4	2.1	2.8	3.1
Ground and port infrastructure	3.2	3.6	2.4	1.9	2.9	3
Tourist service infrastructure	5.1	5.1	3.1	3	3.7	3.8
Natural resources	3.8	1.7	2.7	2.1	4	3.8
Cultural resources	2.2	2.3	1.8	1.7	2.9	2.7
Non-leisure resources	2	1.8	1.7	1.5	2.7	2.7
Environmental sustainability	4.6	4.4	3.5	3.6	3.9	3.9
Socioeconomic resilience and conditions	4.4	5.1	3	3.6	3.9	3.9
Travel & tourism demand pressure and impact	4.6	3.5	4.2	3.9	4	4.1

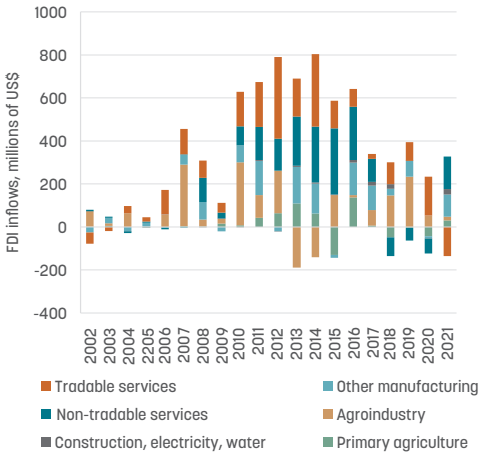
Source: WEF 2022.
Note: Shaded indicators are where Paraguay scores lower than the average of the LAC region.

Part of the challenge could be the lack of foreign direct investment in tourism-related services. Paraguay has an open investment regime overall and very few restrictions on tourism services. The provision of hotel and restaurant services is open to foreign participation in all modes of services trade, while the provision of travel agency and tour operator services is authorized for businesses that offer tourist services for foreign travelers in Paraguay (WTO 2017). Despite this relatively open regime, FDI in the hotels and restaurant sector has been negligible over the past several decades. According to BCP statistics, between 2010 and 2018, FDI inflows in the sector averaged USD 771,976 per year, making up some 0.6 of total services FDI in that period on average (Figure 87 and Figure 88). However, between 2019 and 2022, FDI flows in the hotels and restaurant sector have turned negative (USD 1.468 billion per year, on average), i.e., total outflows of investment have steadily outpaced inflows.[112]

[112] The COVID-19 pandemic may, however, have delayed the opening of new international hotel facilities.

Figure 87. Services FDI has been a major contributor to overall FDI...

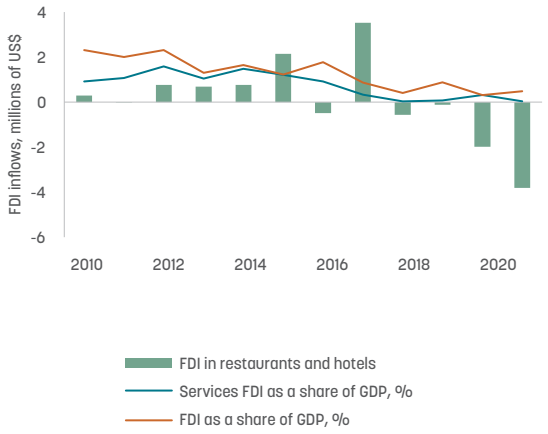
FDI inflows, millions of USD



Source: BCP

Figure 88. ...but not in the hotels and restaurants subsector.

Left axis: millions of USD;
right axis: share of GDP, percent



Source: BCP

With a strategic vision and prioritization of the sector, Paraguay could transform its natural and cultural assets into viable tourism attractions and products. While Paraguay is rich in natural and cultural assets, it has not been able to turn these into a viable tourism offering. This is in part due to the lack of data on the sector, which inhibits investors' and the government's ability to make informed decisions and efficiently allocate resources. For example, MADES does not systematically collect visitation data in national parks, partially due to a limited institutional presence in many of them. Moreover, the limited operationalization of existing legislation — including key provisions of the Law 352/94 of Natural Protected Areas that would enable the creation of the Special Fund for Natural Protected Areas — and the lack of a concessions framework are also key bottlenecks (MADES and UNDP 2020). Only 26 out of the 88 Protected Areas have management plans. Those that exist are inadequate and/or are not complied with, and there is very limited coordination with local communities (MADES and UNDP 2020).

Human capital is also a bottleneck to expanding tourism activity. Paraguay ranks 92nd out of 117 countries in the 'Human Resources and Labor Market' sub-index of the 2021 WEF Index. This reflects the fact that existing labor laws fail to account for the seasonal nature of tourism employment, which creates inefficiencies in hiring. Interviews with the private sector point to an inadequacy of skills in middle management levels and above. This increases the costs for tourism operators, as local workers need to be paid a premium, and hiring foreign workers often involves additional recruitment and retention costs. The Ministry of Work, Employment and Social Security (MTESS) has recently ramped up its offerings for tourism and hospitality training courses to try and address this issue, including through the SINAFOCAL system.

Information gaps limit the impact of efforts to improve marketing, planning, and management. Despite having a National Tourism Observatory, data collection and analysis infrastructure is currently limited.[113] The Observatory lacks the institutional and coordination apparatus, as well

[113] There is basic information on the nationality/origin of tourists and a breakdown on visitors and excursionists.

as the capacity and resources, to be a viable source of data and analysis. In addition, market research or big data[114] could be used to improve the targeting of marketing and promotional activities. These currently rely on traditional channels (trade fairs and street advertising) and could be better targeted, since they use only the previous year's immigration data to determine market of focus. With better data, the country would be able to generate more effective marketing campaigns and create a unique value proposition.

How can Paraguay unlock the potential of services for faster, more resilient, and sustainable growth?

Improve the quality of human capital at all levels to generate more skills-intensive services jobs

A comprehensive skills development agenda is critical for the Paraguayan economy overall, but especially for the services sector. Countries that have succeeded in exporting IT-based services have generally seen their governments make serious efforts to catalyze the growth of the education sector. This is not limited to digital skills, but also encompasses (i) basic literacy and numeracy skills, (ii) general cognitive skills (complex problem solving, critical thinking, and communication), and (iii) management or entrepreneurial skills. Soft skills such as teamwork and customer service are also important in many professional services, as well as customer-facing tasks. Table 3 lists some measures that can be taken to upgrade the quality of the current and future workforce.

Table 3. How can Paraguay improve the capabilities of its key asset — its people?

In the short- to medium-term	Redouble efforts to strengthen the teaching of fundamental literacy and math skills with an emphasis on problem-solving; Ensure that the educational curricula and pedagogical methods are aligned with needs of a modern labor market, encompassing cognitive, socio-emotional and digital skills; Reduce gaps in educational access across income groups, as well as rural and urban areas; Provide incentives for pursuing STEM courses, including digital development courses.
In the longer-term	Strengthen the quality and content of teacher training curricula; Consider increasing education spending from 3.3 to 4 percent of GDP to be more in line with other upper middle-income and LAC economies; Improve the effectiveness of public-private partnerships in the technical and vocational education training framework and in the design/implementation of courses provided by the MTESS; Promote dialogue between universities and firms to align labor demand and supply and prevent labor market misalignments; Support business organizations and associations to build and spread knowledge of and opportunities for technological upgrading.

[114] For example, their breakdown expenditure, activities, demographics, psychographics, and satisfaction with their experience and with different activities and infrastructure.

Expanding the availability of digital infrastructure in schools is critical to improve the level of digital skills. The Ministry of Information and Communication Technology (MITIC) has been implementing the Digital Agenda Support Program to promote training programs and the availability of "infocenters", i.e., spaces equipped with computer equipment, Internet connectivity, and instructors. While laudable, these efforts need to go hand-in-hand with improving digital connectivity in schools, in partnership with the Ministry of Education (MEC). To do so, Paraguay could better leverage the different existing fiber optic infrastructure whose ownership is fragmented among different public players (e.g., MITIC, COPACO, ANDE) and conduct a technical assessment of technology needs in each school. Requiring high bandwidth for all schools may slow the objective of universal coverage because it would prevent wireless infrastructure as a potential option, which is often the best solution for rural areas.

Review regulations that may be preventing a more dynamic business environment for services firms[115]

Paraguay faces significant challenges in providing good quality enabling services such as ICT, electricity, and transportation, which hampers the productivity of firms. This situation could partly be due to the lack of "competitive neutrality", i.e. a level playing field between market operators regardless of ownership (whether public/private or domestic/foreign) in these sectors. Currently, state-owned enterprises (SOEs) are the largest and often monopolistic operators across a wide range of network industries, and benefit from regulatory exemptions in public procurement,[116] labor,[117] and bankruptcy laws.[118] They can also access financing at conditions not available for private firms, such as state guarantees.

Implementing pro-competition reforms in key service and network sectors may boost services value added and productivity. In OECD countries, Barone and Cingano (2011) indicates that lifting restrictive regulations in input services sectors can generate gains in value-added growth in downstream service-dependent industries. According to World Bank analysis (2022b), a simulation exercise in which Paraguay undertakes pro-competition reforms in services sectors such as energy, water, telecommunications, transportation, and professional services — keeping other things equal — suggests potential additions to annual GDP growth of 0.2 percentage points in one year (Table 4). Such pro-competitive reforms could include the strengthening of the regulatory framework to promote a gradual expansion of private sector participation in network industries, the reduction of entry barriers in regulated professional services, and more clear separation of commercial and non-commercial activities for SOEs to improve the quality of basic services.

[115] A more comprehensive discussion of the necessary trade, investment and competition reforms in Paraguay can be found in World Bank (2022b).
[116] Law 2051/2003, article 2 d).
[117] Law 1626/2000.
[118] Law 154/1969 article 2, and Law 1183/1985 (Civil Code) articles 1898.

Table 4. Pro-competitive reforms in four services sectors could boost GDP growth

Sector	Effect of reform on growth in downstream industries with above the median service intensity			
	Estimated impact on annual value added (percent)	Expected impact on GDP measured at market prices 2019		Number of service intensive sectors
		(bill. PYG)	(bill. USD)	
Electricity, water, business/professional services, transport, and telecommunications	0.20	467.31	0.07	14

Source: WB analysis using data from Paraguay's 2015 Input-Output Table available in the EORA Global MRIO and the IMF World Economic Outlook Database.
Note: Following Barone and Cingano (2011), the estimate assumes that, all else being equal, reforms in services sectors will translate into additional value-added growth of 0.2 pp annually. This effect is indicative and may be affected, among others, by (i) differences between OECD and non-OECD economies; (ii) differences in production processes over time; and (iii) changes in PMR methodology. The estimate does not reflect changes in ownership of firms or market structure. The estimate does not include growth in 34 sectors with below-average dependency on services. The estimate assumes that value added and output remained unchanged in Paraguay between 2015 and 2019.

Improving the investment policy and promotion framework could attract more FDI, including in services. Paraguay enacted a relatively strong legal framework to foster FDI in 1991, offering an open investment regime and important guarantees to investors with regards to national treatment, transfer of funds, and access to international arbitration. However, as international practices have evolved, the law could be updated to offer greater transparency and clarity to investors as well as to protect the state against frivolous claims from investors that can be costly to settle. In addition, there are multiple improvements that could be made to the export and investment promotion agency, REDIEX. A clear strategy with key performance indicators (KPIs), coupled with further resources, will be necessary for the agency to perform proactive FDI promotion and provide investor assistance along the entire investment cycle, including crucial aftercare services for existing investors. In the medium term, as REDIEX develops greater capacities, the institution could sponsor a program to link local firms to FDI and foster their participation in regional value chains.

To support the growth of digital trade and digital services exports, the government could provide a clearer legal basis for digital payment and financial services, including the role of fintech. Paraguay currently has a fragmented approach to regulating and supervising payment services, as these are not clearly stipulated in the existing Payment Systems Law. The Central Bank could consider enacting a more comprehensive regulatory focus for payment services and, as such, analyze the legal foundation of the Payment Services Law. Such legislation would not only help to increase consumer confidence in digital trade, but potentially make it easier for informal firms to register and operate in the formal economy.

Improve the diffusion and adoption of digital technologies

Accelerating the adoption of fixed broadband Internet needs to be a priority if Paraguay is to boost services productivity. Closing the digital infrastructure gap relative to the OECD average would increase the country's GDP by 10.5 percent and its productivity

by 8.6 percent (Rosenblatt et al. 2022). Bridging the spatial and social gaps in access to fixed broadband Internet services is therefore critical. To do so, Paraguay can ensure that it leverages all the fiber backbone infrastructure already installed and extend the reach of fiber networks. While fiber optic began to expand in 2020, direct fiber to the home (FTTH) has only reached 16 percent of households. Moreover, Paraguay could consolidate a 'backbone' network that acts 'neutrally' to provide basic connectivity. This would enable local internet service providers (ISPs) to offer last-mile connectivity that can be complemented with other technologies. The existence of a neutral network would improve the wholesale offering of the state operator, Copaco, and may increase competition in commercial models for different population segments.[119]

Establishing a modern data governance regime is also vital. A personal data protection law that is in line with international standards is needed to improve the safeguards and trust of all Paraguayans in digital technologies. Such legislation would protect individuals and provide an institutional framework that is more in line with the goals of developing a digital economy, for example by ensuring the cross-border flow of data. Along the same lines, Paraguay would need to strengthen the institutional framework for cybersecurity, as it currently ranks 89 out of 182 countries on the 2020 ITU Global Cybersecurity Index. A cybersecurity plan was approved in 2017, but efforts to improve implementation and awareness are needed, given the increase in recent attacks.[120]

Sector-specific measures to boost travel and tourism exports

Paraguay could develop a clear and differentiated value proposition to leverage the potential of its tourism assets. As a country that is relatively unknown in international tourism circuits, Paraguay has an opportunity to appeal to niche but high value-added international tourism segments, including adventure and ecotourism. It could articulate a strong value proposition around environmental sustainability and unique experiences, which are growing business trends. However, doing so will require changes to the legislative and regulatory framework, stronger coordination across ministries, investments in human capital and infrastructure, and a greater focus on data-driven marketing and planning. The experience of Costa Rica can be illustrative (Box 10).

Box 10. How did Costa Rica become a leader in ecotourism?

Costa Rica is a household name when it comes to ecotourism, but this has been the result of conscious efforts to develop a value proposition anchored in natural assets. First, the government developed policies, regulations, and infrastructure to support sustainable practices, making a public commitment to environmental protection. For example, to ensure the authenticity and sustainability of ecotourism offerings, it promoted the Certification for Sustainable Tourism, which is currently held by over 400 companies, and the Blue Flag Ecological Program. Second, Costa Rica emphasized community involvement, empowering local communities to participate in and benefit from tourism activities. This involved

[119] For example, the arrival of virtual network operators (fixed and mobile) could stimulate the telecommunications sector and attract investments.
[120] In January 2024, Tigo Paraguay was the victim of a ransomware attack that affected some 300 business servers, as well as the government. Source: Última Hora.

spreading awareness on the importance of environmental conservation both among the population and among tourists. Third, through effective marketing, Costa Rica positioned itself as a premier ecotourism destination. It focused on high-value markets to minimize the environmental footprint of tourism. To achieve this, Costa Rica focused on developing and differentiating its tourism products, improving the quality of offerings, and prioritizing nature-based and wellness niche markets in its promotional efforts.

Source: Costa Rica Tourism Board (2002, 2022); UNWTO (2022).

Strengthening the regulatory framework and institutional coordination in the tourism sector is critical. To ensure proper planning, governance, and management, critical elements of the tourism legislation need to be better articulated and defined. In particular, the institutional framework of the National Council of Tourism could be enhanced by ensuring high-level representation, a clearer mandate, and inclusion of relevant stakeholders (particularly the private sector, academia, and civil society). In addition, reviewing the governance and funding sources for the Tourism Fund could help to support the implementation of the Tourism Masterplan. Prioritization of critical actions is necessary due to the plan's ambitious nature. Adequate resources are also needed to strengthen the collection of tourism statistics and data. This would help to improve marketing and destination management, and to unlock more private sector investment. The collaboration between SENATUR, INE, and BCP in 2022 to carry out visitor surveys[121] is a good example that could be repeated more frequently to generate valuable data.

Supply-side policies could leverage tourism to provide key public goods for inclusive economic development and environmental benefits. Tourism in protected areas can improve the livelihoods of local communities, promote biodiversity and conservation, and be a catalyst for much-needed last mile infrastructure. To that end, finalizing secondary legislation and improving coordination between MADES and SENATUR is crucial. This can be facilitated through an MOU guiding collaboration and capitalizing on each institution's strengths. Developing management plans, improving coordination with indigenous populations, and better data collection are also needed. Awareness campaigns for MADES officials and local communities could help increase understanding and support for conservation funding through sustainable tourism. Additionally, Paraguay could explore establishing a concessions and investment framework in priority locations through public-private partnerships and community-based approaches to conservation and tourism services. Protected areas have the potential to integrate regenerative agribusiness, ecotourism, forest-based initiatives, biodiversity preservation, ecosystem services, and carbon offsets.[122]

While these efforts will take time, there is much that Paraguay can do in the short term to boost international tourism and advance the sustainability of the sector. Facilitating multi-destination circuits for long-haul visitors (i.e., gaining inclusion in the portfolios of international tour

[121] Moreover, the 2017 survey was confined to the period of Semana Santa (Holy Week) and only collected six basic elements: number and origin, access, destination, total spending, and occupancy rates of hospitality providers.

[122] While Paraguay's Valuation and Remuneration for Environmental Services Law mandates firms to allocate 1 percent of their operating costs to environmental certificates, the regulations currently do not include carbon offsetting.

operators that typically target Brazil, Argentina, and Uruguay) could offer short-term gains. To achieve this, a robust understanding of target source markets is essential, which can be obtained through tailor-made consumer market research from third parties. In addition, aligning the business enabling environment with the new, sustainability-focused value proposition is crucial. Paraguay could redouble its efforts to establish sustainability and quality standards for tourism operators, as well as certify specialized guides or operators for key activities. Promoting and prioritizing operators meeting these standards can incentivize their uptake and contribute to overall growth in the tourism sector. Moreover, efforts presented in Table 5 below are relatively low cost and focus on a change of strategic approach aimed to high-value, low volume international tourism, while reinforcing domestic tourism.

Table 5. Policy recommendations to boost tourism and related services exports from Paraguay

Area	Recommendation	Agency
Legislation Tourism Law (Ley Nº 2828 / "***del turismo***")	Implement secondary legislation pertaining to the operationalization of the Tourism Promotion Fund and the National Tourism Council. Implement secondary legislation pertaining to the Technical Committee for Tourism Promotion. Evaluate the potential of transforming the Tourism Promotion Fund into a Tourism Development Fund.	SENATUR
Legislation National Protected Areas or NPA Law (Ley 352/94 "***de Áreas Silvestres Protegidas***")	Create a Concessions framework in Protected Areas, operationalizing the NPA Law. Implement secondary legislation pertaining to the operationalization of the Environmental Fund, with specific provisions for tourism in protected areas. Implement secondary legislation pertaining to the National Council for Protected Areas, with SENATUR as a key member.	MADES SENATUR (support)
Strategic planning and institutional strengthening	MoU between SENATUR and MADES on boosting sustainable tourism in protected areas and knowledge transfer between institutions. Enhance the Tourism Master Plan to include strong provisions for nature-based tourism and kickstart the development of a new, sustainability-focused value proposition, and specific actions to boost domestic tourism. Update Tourism Marketing Plan with a focus on specific high value segments of non-traditional markets (USA, Spain).	SENATUR MADES
Data and marketing	Increase the capacity of the Tourism Observatory to provide actionable data for tourism marketing and planning. Implement familiarization trips with international tour operators offering multi-destination trips to tap into new markets.	SENATUR
Sustainability and competitiveness	Support the development and adoption of sustainability criteria throughout the tourism value chain (e.g., accommodation providers, tour operators) to reduce overall environmental impact. Select pilot public national protected areas and develop management plans coordinated between MADES, SENATUR, subnational governments, and local communities.	SENATUR MADES

Chapter 4 —
How can the government support the competitivity and resilience of the agriculture sector?

Key messages

- The Paraguayan agriculture sector has achieved competitivity at a global scale, but can still improve its efficiency and resiliency to external shocks, especially among small producers.
- Most small producers lack the means to face external shocks, which contributes to the persistence of elevated rural poverty.
- There is ample room to improve the efficiency of agriculture public spending execution, especially on agriculture investment projects.
- To make the agriculture sector more competitive and resilient, Paraguay can direct more resources towards extension services and research and development, improve the institutional management of public agriculture spending, and implement an agriculture risk financing strategy.

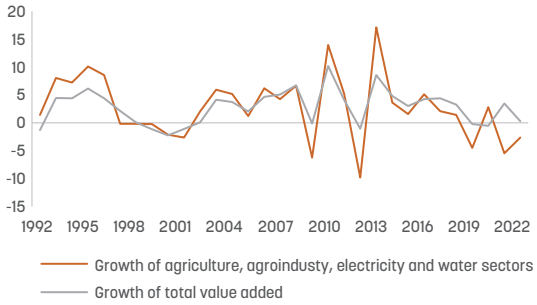
Agriculture is a key source of growth and poverty reduction...

Paraguay's economic growth is tightly linked to the agriculture sector. The primary sector[123] and agroindustry[124] together account for 21.6 percent of GDP (average between 2019 and 2022), and their fluctuation is highly and positively correlated with that of total value added (Figure 89). This is because fluctuations in agriculture affect other sectors through backward and forward linkages.[125] In terms of exports, primary agriculture products contributed to 62.8 percent of total direct exports on average between 2019 and 2023, and consist of mainly raw soybeans and beef (Figure 90). According to World Bank analysis, variations in primary sector output are associated with 67 percent of the variation in quarterly tax revenues.[126] The sector is also vital to rural livelihoods and food security. While around 17.4 percent of workers are employed in the primary sector at the national level, this share increases to 42.8 percent in the rural regions of the country (INE 2022).

[123] Encompasses the production of crops, livestock, forestry, fishing, and mining.
[124] The definition of agroindustry in this report comprises the processing of meat, oils, dairy, cereals, sugar, other food, leather, wood, pulp, and paper products.
[125] Forward linkages refer to the contribution of agriculture to other sectors (e.g., processing of crops), while backward linkages refer to the contribution of all other sectors to agriculture (e.g., transport, logistics).
[126] Using quarterly data from the MEF and BCP, a one percent decrease in the primary sector's value added is associated with a decrease in tax revenues of 0.52 percent in the same quarter, ceteris paribus.

Figure 89. Overall growth is highly correlated with agriculture and agroindustry...

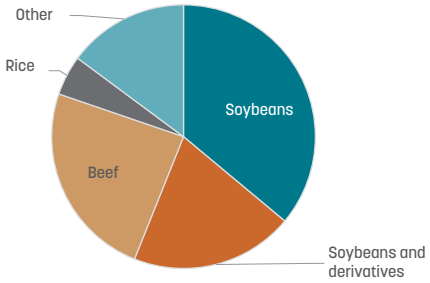
Growth in value added, year-on-year



Source: BCP, staff calculations.

Figure 90. ...which is heavily concentrated in two commodities — soy and beef.

Share of total agricultural exports, percent (average from 2017-2021)



Source: BCP, staff calculations.

The agriculture sector has experienced large productivity gains, although there is room for further growth. According to USDA data, total factor productivity (TFP) of the agricultural sector in Paraguay[127] — a measure of technical and efficiency change in the sector — has risen rapidly since 2004 at a faster pace than the rest of the LAC region (Figure 91). This may reflect the fact that commercial soybean production began relatively later in Paraguay than in Argentina and Brazil, prompting a shift away from labor towards a much more capital-intensive production model. Supported by private investment and knowledge transfers, especially from Brazil, the proliferation of genetically-modified seeds and no-tillage farming approaches[128] have boosted yields per hectare in soy (Figure 92) (Calegari et al. 2020 and INBIO 2022). As a result, Paraguay has been one of the top five global exporters in soybeans since the mid-2000s.

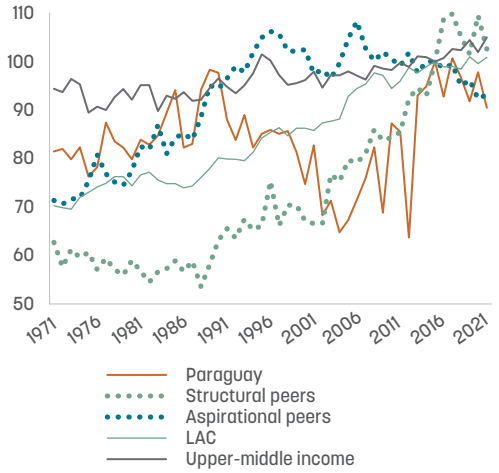
Similarly, in livestock, better animal genetics and high-yielding varieties of tropical pastures have improved TFP (Nin Pratt et al. 2019). However, TFP growth has slowed in recent years. One possible explanation is that agricultural and livestock activity has increasingly moved from the Eastern region to the Chaco, where production has been less efficient (Lema and Gatti 2021).

[127] TFP refers to average productivity of all inputs employed in the production of all agricultural commodities. As a result, it differs from more narrow measures such as crop yield per acre or agriculture value added per worker. Source: USDA.

[128] No-till farming systems enable better soil water storage and decreased erosion, thus improving yields and net farm income. National sources indicate that most commercial producers use this technique. Source: ABC 2022.

Figure 91. Agriculture productivity has grown rapidly in Paraguay in the last two decades...

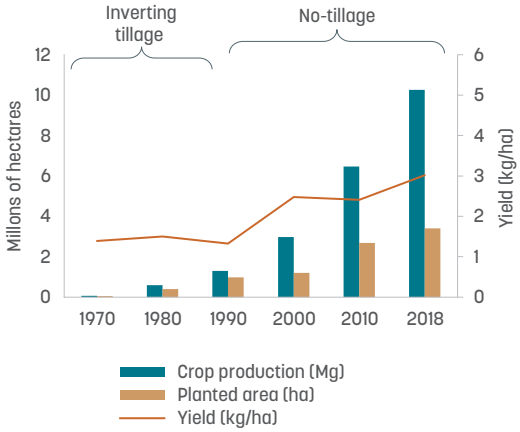
Total factor productivity index (2015 = 100)



Source: USDA Economic Research Service 2022.
Note: Chart indicates where TFP is growing faster or slower, but does not indicate where productivity levels are higher or lower.

Figure 92. ...as the adoption of new technologies boosted soybean yields.

Millions of hectares (left axis); yield (kg/ha) (right axis)



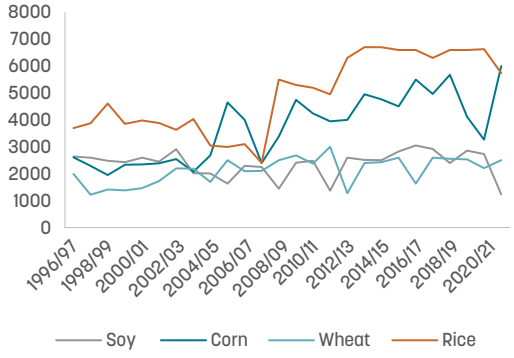
Source: Calegari et al. 2020

Despite the success of commercial agriculture, most farmers are smallholders who do not reap the benefits of these productivity gains. Like many developing economies, Paraguay has a dual agriculture sector, exacerbated by its historically high inequality of land distribution.[129] According to data from the National Agricultural Census (CAN) in 2022, 92 percent of cultivated land in Paraguay is dominated by 9 percent of farms.[130] They specialize in capital-intensive commodities such as soybean, beef, maize, and wheat. The rest of the production area is shared among 91 percent of farms, which mostly consist of smallholder or family farmers[131] who plant subsistence crops — primarily cassava, beans, white corn, and sesame.[132] Yields per hectare for subsistence crops have largely stagnated over the past decade — in contrast to newer commercial crops such as rice and maize (Figure 93 and Figure 94). While there is heterogeneity among family farmers in terms of their integration into value chains and efficiency of production (Nin-Pratt 2018; Lema and Gatti 2021), they generally lack access to formal titles and face more challenges in accessing credit (Arce and Arias 2015). According to the 2022 CAN data, just 51 percent of farms under 100 hectares had clear titles, and only 13 percent accessed some form of credit.

[129] Paraguay's land Gini coefficient was estimated at 0.93, or near perfect inequality, in 2008 (Galeano 2012). See the discussion in World Bank (2014).
[130] Data from the 2008 Agriculture Census (latest available at the time of writing).
[131] Law No. 6286 (2019) defines family farming as a rural production activity that mainly uses family labor and is primarily intended for self-consumption and farm income. To qualify as a family farmer, producers may not hire more than 20 salaried day laborers during the year on a temporary basis at specific times of the production process, who must reside on the farm or in nearby communities. In addition, producers must not use more than 50 hectares in the Eastern Region and 500 hectares in the Western Region.
[132] Historically, cotton was the major crop planted by family farmers and also the main export crop, but output dropped sharply in the 1990s due to low global prices and mismanagement of the government cotton reactivation program (U.S. Department of State 2000).

Figure 93. Yields per hectare have risen for newer commercial crops such as rice and maize...

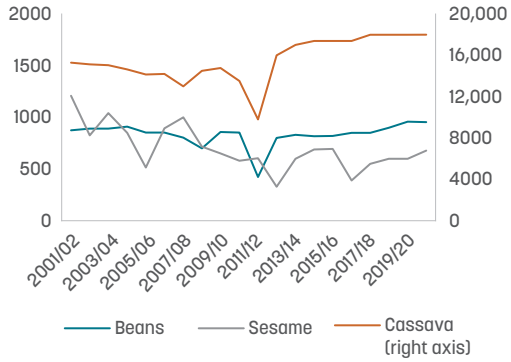
Yields per hectare, kg/ha



Source: World Bank (2023) using MAG data.

Figure 94. ...whereas they have mostly stagnated for subsistence crops.

Yields per hectare, kg/ha (cassava shown on right axis)



Source: World Bank (2023) using MAG data.

....but also a source of economic and social vulnerabilities.

The agriculture sector faces three main challenges:

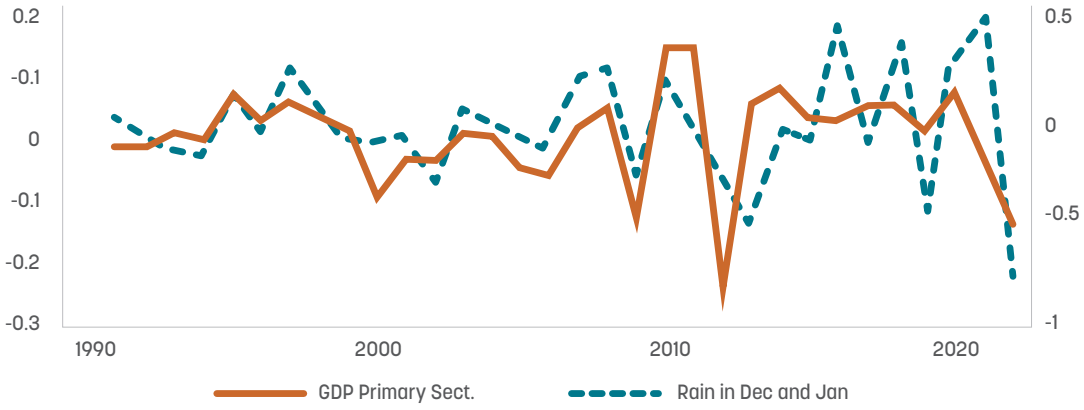
First, sector growth is vulnerable to external shocks such as extreme weather events. The standard deviation of real value-added growth of the primary sector in Paraguay was 16 percent over 2002-2022, higher than all peer groups[133]. This is due to the high concentration of production in soybeans (80 percent of all crop exports), which is heavily reliant on favorable precipitation in the Eastern region during the sowing season[134] (Figure 95). While Paraguay is not unique in this regard, the concentration of production (three-quarters of crop production takes place in just four states in the Eastern region[135]) and heavy reliance on two trading partners limit risk diversification. 74 and 17 percent of raw soybean exports, respectively, go to Argentina and Brazil. Processed soy products are exported to more destinations, but these make up only a small share of total exports.[136] Beef exports are more diversified, reaching some 50 countries, but 66 percent went to Chile, Brazil, and Taiwan in 2022.

These shocks represent severe economic losses for the Paraguayan economy. According to World Bank analysis, the variations in past yields of the main crops grown in the country (soy, corn, wheat, beans, and cassava) indicate expected annual losses of USD 504 million, equivalent to 7.6 percent of the total risk exposure or 1.2 percent of 2022 GDP on average. Indeed, droughts caused recessions in 2009, 2012, and 2022. More severe and rare shocks, such as a once-in-a-century drought,[137] could lead to USD 3 billion in losses, equivalent to 45.6 percent of agriculture GVA or about 7 percent of GDP in 2022.

[133] This is triple the average for LAC (5.1 percent), its structural and aspirational peers. Source: WDI.
[134] Soybean needs favorable soil moisture conditions for planting, and is typically done in September and October. In 2020, however, the planting season was delayed to December for the bulk of the sowing.
[135] These are Alto Paraná, Canindeyú, Itapúa, and Caaguazú.
[136] This refers to total exports excluding re-exported goods. Soybean meal accounts for 16 percent of total exports, while soy oil accounts for 5 percent. Soybean meal and oil were sent to 23 and 15 different destinations.
[137] From a stochastic analysis of the historical variation in crop yields for selected crops. See World Bank (2023c).

Figure 95. Rainfall in two months of the year is highly and positively correlated with agricultural output growth

Primary sector value-added year-on-year growth, percent; total rainfall in December and January, meters (secondary axis)

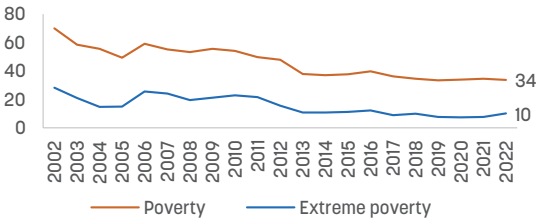


Source: Staff calculations using data from BCP and Hersbach et al. (2018).
Note: A new methodology for measuring agricultural output that is more aligned with the 2008 United Nations System of National Accounts was applied starting from 2014, in line with GDP rebasing. This results in a weaker correlation between rainfall and agriculture GDP in recent years.

Second, poverty and vulnerability remain high in areas with a high concentration of family agriculture. Because soybeans are very un-intensive in labor, family farmers have not benefited in a significant way from Paraguay's success in this crop. The pace of rural poverty reduction has slowed since 2013, stagnating at around 36 percent of the rural population (Figure 96). 42 percent of households who still live in poverty are headed by agricultural workers, and income poverty is higher in states that are more dependent on family agriculture such as Caaguazú, Caazapá, and San Pedro (Figure 97).

Figure 96. Rural poverty has stagnated at around 34 percent...

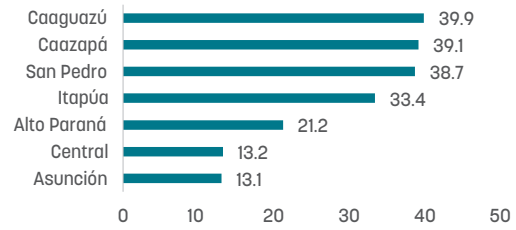
Share of rural population, percent



Source: INE (2022).
Note: Measured at national poverty lines.

Figure 97. ...and is higher in regions that are more dependent on family agriculture.

Income poverty, share of population, percent

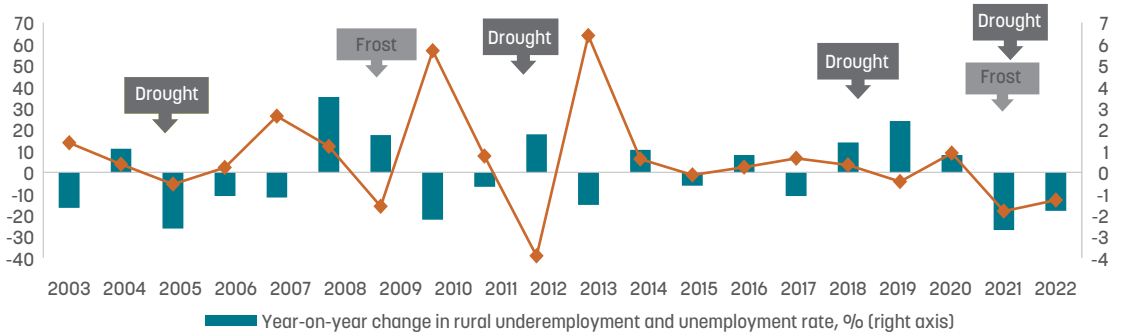


Source: INE (2022).

In part, this is because family farmers lack mechanisms to cope with external shocks. When droughts, floods, and other shocks occur, family farmers confront the simultaneous shocks of (i) lower yields from subsistence crops and hence higher food insecurity, (ii) fewer possibilities to earn supplementary income from the commercial production of crops, which employ some labor from family farms, and (iii) lower non-farm income as local economic activity slows. As a result, declines in agriculture production due to droughts and frosts are typically followed by

increases in rural unemployment and underemployment (Figure 98). The Ministry of Agriculture and Livestock (MAG) allocates some resources to assist family farmers during such events, but the amounts are generally small[138] (World Bank 2023c).

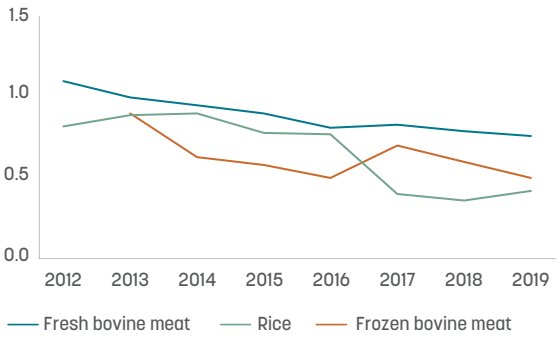
Figure 98. Labor market indicators in rural areas typically worsen after droughts and frosts
Year-on-year change, percent



Source: Staff calculations using data from BCP and INE.
Note: The bars indicate the year-on-year change in the gross value added of agriculture production; the line denotes the year-on-year change in the average rate of rural unemployment and subemployment.

Third, Paraguay's agricultural products have tended to obtain lower average prices on the global market compared to the average of other exporters, which could indicate competitivity concerns. The perceived quality of agricultural exports from Paraguay, as proxied by the unit export price,[139] has declined in recent years (World Bank 2022b). For example, unit export prices of fresh and frozen beef from Paraguay to Chile are below the median price of all exporters and have been declining over time, falling to about 80 percent and 50 percent of the median export price, respectively (Figure 99). Indeed, both Argentina and Uruguay earn significant premiums relative to Paraguay when it comes to beef exports due to gaps in quality controls, traceability systems, and inadequate marketing efforts (Ramirez Pastore and West 2019, USDA 2023). Similarly, milled rice exports from Paraguay to Chile have also fallen to about 40 percent of the median export price (World Bank 2022b).

Figure 99. Relative export prices of beef and rice have fallen
Ratio of Paraguay's median export price to median global export price



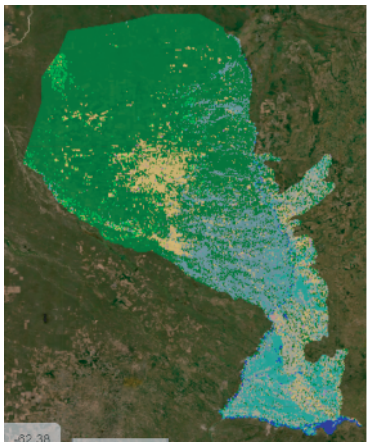
Source: World Bank 2022b, estimated from Berthou and Emlinger (2011).

[138] In 2008, 2012, 2021, and 2022, MAG reallocated USD 14-USD 16 million each year (around 0.04 percent of GDP) from its annual budget to assist farmers affected by the droughts. In January 2022, the government also provided USD 1 million to support 21,200 small producers in purchasing inputs, and special financing facilities.
[139] For narrowly defined categories of goods, unit export prices can be used as a proxy for quality. The products compared here are fresh bovine beef, frozen bovine beef, and milled rice under the HS6 codes of 020130, 020230 and 100630, respectively. While these are narrow categories, they can still include subcategories that can affect the interpretation of the comparison if countries specialize in substantially different subcategories.

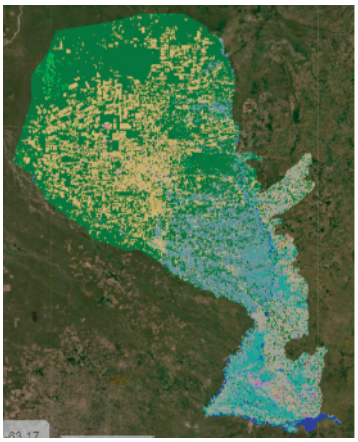
It is possible that a history of deforestation and lack of traceability systems have hindered a more rapid growth of Paraguayan agriculture exports to advanced economies. As noted in Chapter 1, Paraguay's agriculture output growth has been driven by aggressive expansion of the agriculture frontier, which has led Paraguay to lose 5.6 million hectares of native forest (-28 percent) between 2002 and 2022.[140] Deforestation was initially driven by the growth of commercial soybean production in the Eastern region, but then gradually shifted to the Chaco (Figure 100) as a Zero Deforestation Law was established in 2004 to cover only the Eastern region (Nin-Pratt et al. 2019; Milán and Gonzalez 2022). Cattle ranching is the primary driver of deforestation in the Chaco, although soy and maize production are rising (Henderson et al. 2021). Annual deforestation rates in the Chaco doubled from 0.8 percent per annum over 1995-2007 to 1.7 percent per annum over 2008-2020 (da Ponte et al. 2022). Under current legislation, most of this deforestation is considered legal.[141] Deforestation has also continued in the East, reflecting patchy enforcement of the Zero Deforestation Law.[142] If it does not demonstrate its use of sustainable production methods throughout the sector, Paraguay risks being left out of the growing demand for more sustainable products, especially in advanced economies. Paraguay's current exposure to the European Union's law against "imported deforestation" could increase if it considers indirect impacts, and if other importers eventually follow suit and Paraguay does not adopt pertinent measures (see Box 2 in Chapter 1).

Figure 100. The conversion of native forests to pasture and crop has mostly occurred in the Western Region of Paraguay over the past two decades

Panel a: Land use in 2002



Panel b: Land use in 2022



Source: Maps Biomas Chaco.
Note: According to the project's methods, dark green denotes natural woody vegetation; light green denotes natural non-woody vegetation; yellow areas denote crop and pastureland; blue areas denote water; other shaded areas are urban or unclassified.

[140] From 2001 to 2021, Paraguay lost a third of its tree cover or 6.6 million hectares of tree cover.
[141] By law, in Western Paraguay, if a property is larger than 20 hectares, up to 45 percent of forest must be preserved as legal reserve and buffers for pasture and riparian areas. According to INFONA estimates, 86 percent of identified land use changes took place within properties that had approved Land Use Plans. However, da Ponte et al. 2022 also show that forest clearing has also taken place in protected areas in the Chaco.
[142] An estimated 75,000 hectares of forest was cleared in the Atlantic Forest in 2019 (Tyldesley 2021).

Over the long term, the competitivity of the agriculture sector could also be affected by climate change, which is expected to bring more frequent and severe meteorological disturbances. In the future, climate change could bring about more frequent and severe droughts, which, in turn, would increase expected crop losses. It is expected that an increase in temperatures will reduce key crop yields, such as soy, maize, and wheat, in the most country's important growing regions. According to World Bank estimates, the effects of climate change could reduce typical crop yields by 1.1 to 4 percent by 2050 relative to the average for the last five years, depending on the climate change scenario (World Bank 2024a). This not only threatens to slow Paraguay's economic growth by impacting overall agriculture output, but also impacts food security and welfare.

Improving the productivity, resilience, and sustainability of the agriculture sector could make it more competitive and profitable. Simulations indicate that increasing the efficiency of land use can lead to a 'win-win' situation in Paraguay, allowing it to more than double current agriculture output while reducing methane emissions and net carbon storage by one third and one fourth, respectively (World Bank 2024a). Achieving this would require substantial public investments in irrigation and other extension services, as well as better access to finance for family farmers who typically lack the cash flow, know-how and incentives to adopt new technologies that enhance sector productivity and reduce emissions (Arce and Arias 2015).

The next section discusses how Paraguay has been utilizing public resources to boost the productivity and resilience of the agriculture sector. The sector's outcomes are jointly influenced by macroeconomic (including trade, fiscal, and financial) and sector-specific policies. This chapter focuses on the role of fiscal policy, specifically on public expenditure, because there are no significant exchange rate or trade distortions that affect outcomes of the agriculture sector in Paraguay, which is positive. Public spending can help farmers cope better with and mitigate the impact of shocks, improve farmers' access to markets and enable them to invest in new technologies. However, as the next section shows, the achievement of these objectives depends on efficient implementation.

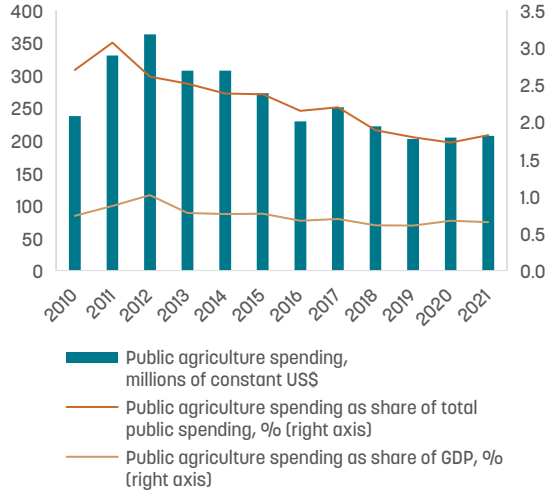
Public spending in the agriculture sector has been low in comparison to its importance

In terms of direct expenditure, the government of Paraguay spends relatively little on the agriculture sector.[143] According to analysis of BOOST data from the MEF, it is estimated that public spending on the sector[144] averaged USD 207 million annually between 2010 and 2021, equivalent to 0.7 percent of GDP or just 2.3 percent of total public spending. These shares have not changed much over the past decade, and in fact have slightly declined as a share of total public spending (Figure 101). Paraguay's "Agriculture Orientation Index" — the ratio of the share of government expenditures on the sector over its contribution to GDP — has been consistently below most peers, especially compared to the rest of the LAC region (Figure 102).

[143] This analysis does not include spending on infrastructure carried out by other entities, e.g., the road infrastructure that could generate benefits to the sector in terms of logistics, access to services, and labor.
[144] Defined as the spending by the MAG, as well as autarchic sector-specific institutions such as IPTA, INFONA, SENACSA, SENAVE, and INDERT.

Figure 101. Paraguay spends very little public funds directly on the agriculture sector...

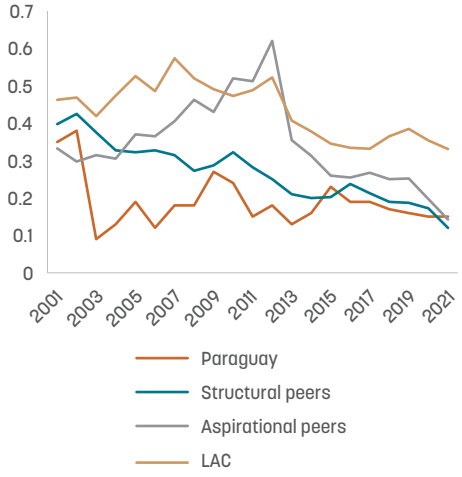
Public agriculture spending, millions of constant USD/as a share of GDP and total budget, percent (right axis)



Source: MEF BOOST data.

Figure 102. ...especially relative to the sector's importance in the economy.

Ratio of public expenditure on agriculture to contribution of agriculture to GDP



Source: Staff calculations from FAO 2022.

Public spending on agriculture has become increasingly reliant on external financing. On average, only a third of the budget for agriculture between 2010 and 2021 came from treasury resources (Figure 103). 44 percent came from institutional resources,[145] i.e., those generated and managed by public institutions themselves, while the remaining 29 percent from public debt, i.e. resources from sovereign bond issuances and loans from international organizations. Reliance on such external financing has increased rapidly over the past decade, by 24.7 percent per annum on average. Securing Congressional approval for external finance (as required by Paraguayan law) and ensuring their timely disbursements can be challenging, in addition to other internal issues that affect execution independent of the source of financing.[146]

Public spending on research and development, risk mitigation, and forestry management has been especially limited. In Paraguay, public spending on agriculture is divided across seven entities (see Box 11). As shown in Figure 104, about 35 percent of these funds are destined for the Ministry of Agriculture and Livestock (MAG), followed by the Agricultural Habilitation Credit or CAH (28 percent). The National Institute for Rural and Land Development, INDERT is typically allocated another 14 percent of funds. By contrast, institutions responsible for setting and enforcing health and quality standards for animals (SENACSA) and plants (SENAVE) only receive 11 and 7 percent of the budget respectively. These institutions play a key role in risk mitigation and also in expanding Paraguay's access to agriculture markets, particularly for organic agriculture products (World Bank 2022b). Finally, institutions responsible for research and development (IPTA) and sustainable forest management (INFONA) receive the

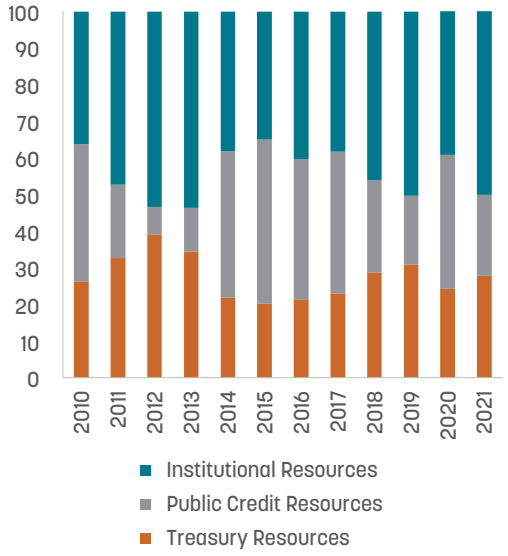
[145] Treasury resources refer to tax and non-tax revenue and any revenue that has no specific pre-established destination. "Institutional resources" arise from legal provision, partnership, or transfers, including revenue generated by the production of goods/provision or services by different state agencies and entities. Source: IDB (2011).

[146] For example, the 2018 Agriculture Census financed by the IDB was delayed to end-2022, in part due to the COVID-19 pandemic but also due to delays in the bidding process and changes in the Agricultural Census Directorate of MAG.

least amounts of resources (just 3 percent of total public agricultural spending, respectively). Given the low level of overall resources, this suggests that these institutions are working with extremely limited budgets, which in part explains Paraguay's low density of agriculture researchers compared to neighboring countries[147] and gaps in the adoption of sector quality and traceability standards.

Figure 103. Reliance on external financing has increased

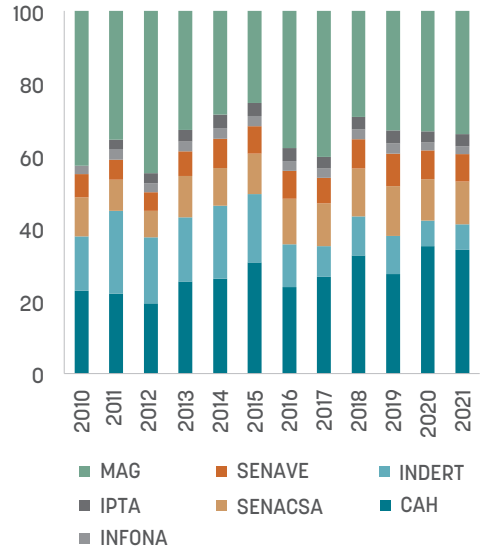
Share of spending by financing source, percent



Source: MEF BOOST data.

Figure 104. Institutions supporting quality enhancement, innovation and sustainability receive fewer resources

Share of public agricultural budget, percent



Source: MEF BOOST data.

Box 11. Agriculture management is split across different entities in Paraguay

The Ministry of Agriculture and Livestock (*Ministerio de Agricultura y Ganadería*, or MAG) serves as the governing body responsible for sectoral policy and for promoting the agriculture sector's development. Specifically, it is responsible for promoting agricultural and forestry production, strengthening family agriculture, food security, improving agricultural competitiveness, among others. Its main functions are carried out through (i) the Vice Ministry of Agriculture, (ii) the Vice Ministry of Livestock, and, more recently, (iii) the Vice Ministry of Family Agriculture.

The Agriculture Credit Enabling program (*Crédito Agrícola de Habilitación*, or CAH) is an autarchic or decentralized government agency which finances long-term credit for (on-farm) investments and short-term credit for operating costs. It caters specifically to the needs of small and low-income agricultural and agro-industrial rural producers, offering soft/low-interest loans.

[147] Despite improvements, Paraguay has one of the lowest agriculture R&D intensity ratios in the region and relies heavily on technologies from Brazil and Argentina (Stads et al. 2014). It also has fewer agriculture technology firms compared to its neighbors (Morris et al. 2020).

Established in 2004, the National Institute for Rural and Land Development (*Instituto Nacional de Desarrollo Rural y de la Tierra*, INDERT) aims to better integrate the rural population into economic and social development. To achieve this goal, INDERT works to ensure access to rural land, clarify and regularize land tenure, and coordinate efforts to advance rural development.

The National Animal Quality and Health Service (*Servicio Nacional de Calidad y Salud Animal*, SENACSA) aims to enhance levels of competitiveness, sustainability, and equity within the livestock industry. SENACSA aims to achieve this through the protection, maintenance, and improvement of animal health, as well as ensuring the quality and safety of animal products and by-products.

The National Plant and Seed Quality and Health Service (*Servicio Nacional de Calidad y Sanidad Vegetal y de Semillas*, SENAVE) was formed in 2005 from the merger of MAG's Department of Plant Protection, Seed Management, Cotton and Tobacco Oversight Office and its Department of Internal and External Marketing of Products and Vegetable Byproducts. SENAVE aims to improve quality, implement phytosanitary standards, and prevent adverse effects on humans and on the environment.

The Paraguayan Institute of Agricultural Technology (*Instituto Paraguayo de Tecnología Agraria*, IPTA) is dedicated to the generation, retrieval, adaptation, validation, dissemination, and transfer of agricultural technology. It also oversees the management of agricultural and forestry genetic resources. IPTA aims to boost the productivity of agricultural and forestry products to increase the competitiveness of the sector in both domestic and export markets. IPTA was created in 2012 as a merger of the Agricultural Research Directorate and the Animal Research and Production Directorate. IPTA also trains farmers and researchers.

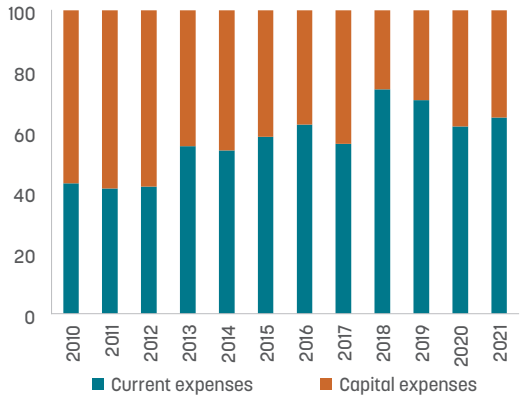
The National Forest Institute (*Instituto Forestal Nacional*, INFONA) promotes sustainable forest management through an inclusive and participatory approach, while adhering to competition laws. INFONA aims to ensure that forest resources are used responsibly, fostering long-term benefits for current and future generations. INFONA was created in 2008.

Sources: Websites of the respective entities.

Most public agricultural spending is allocated to recurrent items. Current expenses make up more than half of total public agricultural expenditure, a proportion that has steadily increased over time (Figure 105) but on par with the pattern among Paraguay's peers (FAO 2022). Most of the increase in current expenses reflects increases in remuneration for administrative staff, which make up about a third of all public agricultural expenditure (Figure 106). Current transfers, which make up 16 percent, have also increased. On the other hand, the share of capital expenditures has decreased from 56 percent to just 35 percent of the total in 2021. Despite the need for more investment in infrastructure in the sector, capital expenditures have steadily decreased by around 1 percent per annum on average over the past decade.

Figure 105. Most of the agriculture budget goes to recurrent expenses...

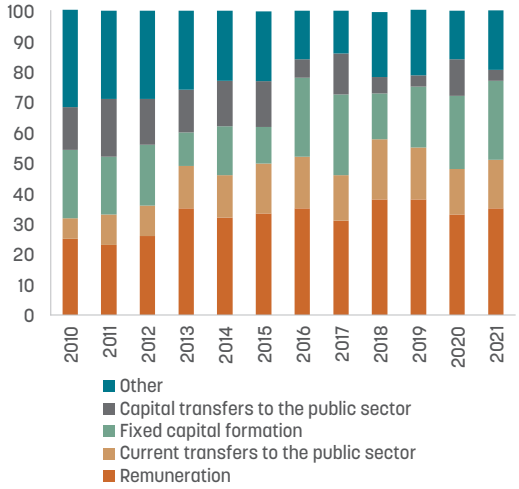
Share of total, percent



Source: MEF BOOST data.

Figure 106. ...mostly to finance wages and current transfers.

Share of total, percent

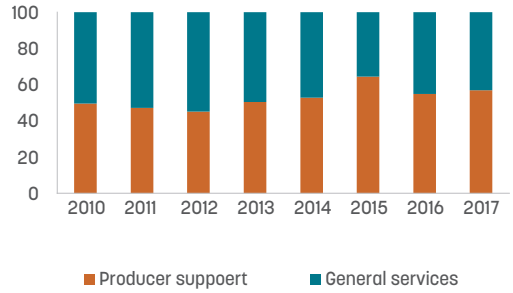


Source: MEF BOOST data.

Consistent with best practices, Paraguay does not spend much on direct support for agricultural producers. Best practices (OECD 2022; Gautam et al. 2022) indicate that public agricultural spending should prioritize *general services* such as commercialization, development and maintenance of infrastructure, sanitary and phytosanitary inspection, and the creation of knowledge and innovation that serves the entire sector without generating distortions, rather than *producer support*, which primarily refers to the purchase of agricultural equipment and tools for individual producers (OECD 2022). In Paraguay, the split between the two categories — except in 2015 — has been roughly balanced during the 2010-2017 period (Figure 107). The share of public resources in the sector that directly supports producers is low relative to the region (Figure 108).

Figure 107. Public spending on the sector is relatively balanced between producer and general services support

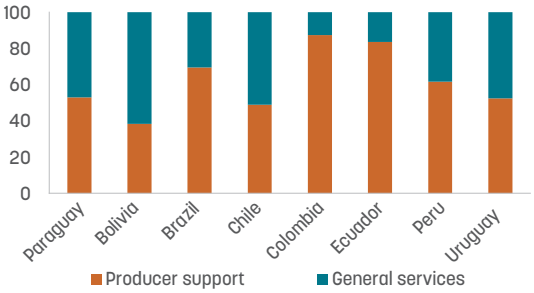
Producer support versus general services support in Paraguay, percent



Source: IDB 2019.

Figure 108. On average, direct support in Paraguay is lower compared to the rest of the region.

Producer support versus general services support in other LAC countries, 2010-2017 average, percent

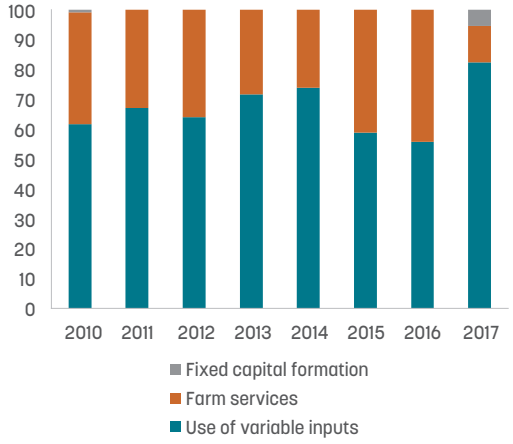


Source: IDB 2019.

Most direct producer support goes to subsidizing financing for the purchase of machinery and equipment, while most general services are spent on knowledge transfers. Looking at the composition of *direct producer support*, the main bulk of this spending over 2010-2017 financed "fixed capital formation", i.e., helping producers purchase machinery and equipment, and was thus mostly funneled through CAH. As for *general services support*, most of this went towards transfers of agricultural knowledge and innovation, and then to phytosanitary and sanitary inspections and control, largely executed by SENAVE and SENACSA (Figure 110). Spending on the maintenance and development of rural infrastructure, and promotion and marketing, only accounted for a fraction of resources.

Figure 109. Direct support is targeted to subsidize financing for the purchase of machinery and equipment...

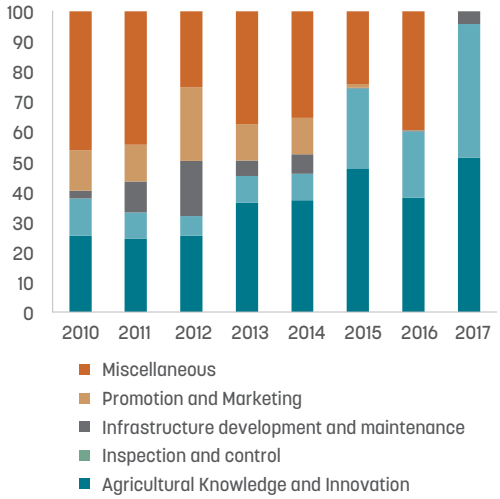
Composition of direct producer support, percent



Source: IDB 2019.

Figure 110. ...while general services are spent more on knowledge transfers.

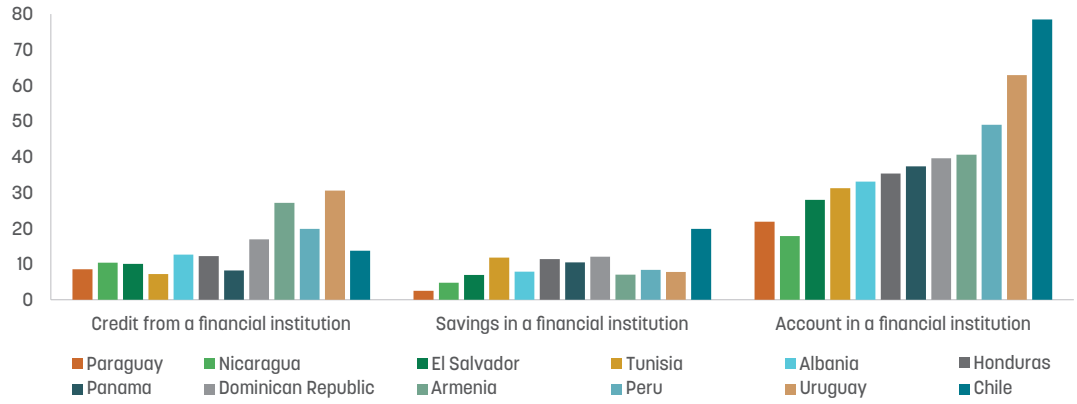
Composition of general services support, percent



Source: IDB 2019.

The overall level of subsidized financing to family producers is low. Despite the existence of CAH, family farmers face significant limitations in access to finance due to their lack of collateral. This is because even though CAH accounts for a third of all public agriculture expenditure, it benefits a small share of producers. According to the results of the 2022 Agriculture Census, only 12.6 percent of family farmers were found to have access to some type of credit, mostly from CAH or BNF. CAH made up only 1.4 percent of all agriculture financing in the country in 2022 (Brunstein 2023). According to a survey in 2021, only 9 percent of respondents residing in rural areas in Paraguay have ever borrowed from a financial institution, among the lowest share in LAC (Figure 111). Moreover, private agricultural insurance penetration is low and estimated at 0.03 percent of GDP and 0.6 percent of agriculture output (World Bank 2023c).

Figure 111. Only 9 percent of Paraguay's rural population had borrowed from a financial institution in 2021
Share of working-age population in rural areas, percent



Source: World Bank Global Findex 2021 (Demirgüç-Kunt et al. 2022).

Public agriculture spending prioritizes productivity and resilience, but efficiency of execution can be better

Public spending on agriculture is guided by strategic action frameworks that contribute to the goals of increased productivity and resilience. Since 2009, MAG has conducted its operations based on the Strategic Agricultural Frameworks, which serve as programmatic and budgetary guidelines for the institution. Over time, the frameworks demonstrate a consistent focus on agriculture competitiveness (Table 6). While they do not explicitly mention productivity, they feature objectives that contribute to it such as strengthening public services, promoting sustainable development, and ensuring access to rural land tenure. In the case of resilience, only the more recent frameworks emphasize it from a risk management angle.

Table 6. MAG's Strategic Agriculture Frameworks prioritize competitiveness

2009-2018	Development of Agricultural Competitiveness
	Development of Family Farming and Food Security
	Sustainable Forest Development and Provision of Environmental Services
	Livestock and Farmer Development
	Agro-Energy Development
2014-2018	Development of Agricultural Competitiveness
	Development of Family Farming and Food Security
	Sustainable Forest Development and Provision of Environmental Services
	Livestock and Farmer Development
	Risk Management associated with Variability and Climate Change
	Social Integration, Employability, and Rural Entrepreneurship
2020-2030	Development of Competitive Markets
	Land Tenure
	Strengthening of Public Support Services

Most investment programs intend to boost agriculture productivity and resilience, but the majority are not executed effectively. Looking at the 17 ongoing investment projects, three-quarters of them include objectives and/or actions that are relevant to the objectives of improving agriculture productivity and resilience. These include, among other aspects, improving the production base, conserving and rehabilitating natural resources, strengthening access to financial services and markets, and fostering the adoption of technologies. However, only a quarter of projects — corresponding to 11 percent of MAG's investment spending — contribute to these objectives *and* have high budget execution rates, i.e., above 70 percent (Table 7 and Table 8). This situation is particularly critical considering that most investment projects (96 percent of the resources allocated between 2010 and 2021) in the sector prioritize family agriculture.

Table 7. Most public agricultural investment projects focus on family farming, and had low budget execution rates on average over the past decade

Investment project	Average budget execution, 2010-2021	Share of total public agriculture investment, %
Equipment for Agricultural Production Project in Paraguay — PEPAP	44%	15.2%
Sustainable Natural Resource Management (PMRN-KFW)	79%	0.8%
Strengthening of the Agricultural Sector — Phase II	99%	0.5%
Sustainable Rural Development Project — PRODERS	60%	37%
Focem — Biosafety Lab. and Strengthening of the Food Control Lab	20%	3%
Focem-Strategic Plan for the Eradication of Foot-and-Mouth Disease in Mercosur	43%	1%
Support for Economic Integration of the Paraguayan Rural Sector	41%	2%
Empowerment of Rural Poor Organizations and Harmonization of Investments	55%	3%
Modernization of Public Management of Agricultural Support (IDB 1800-OC-PR)	85%	0%
Modernization of Public Management of Agricultural Support (IDB FAPEP-1725/OC-PR)	45%	6%
Strengthening of Family Farming Ñamombarete Ñemity Jopara	75%	1%
Inclusion of Family Farming in Value Chains	58%	3%
Improvement of rural and indigenous communities in the Eastern Region (PROMAFI)	8%	3%
Restoration and Sustainable Management of Natural Resources PMRN (P. III)	0%	1%
Improvement of Peasant and Indigenous Family Agriculture in the Eastern Region Value Chain (PROMAFI Phase II)	20%	2%
Restoration of Family Farming Production Systems	62%	15%
Improving Market Insertion in the Eastern Region (PIMA)	67%	8%
Average budget execution	50%	NA

Table 8. Most investment programs are relevant for both productivity and resilience, but not very efficiently executed

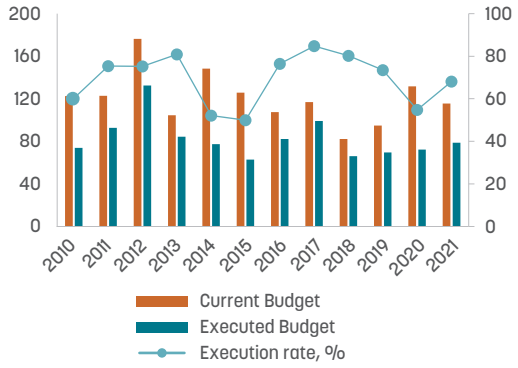
Type	Share of analyzed spending, %	Number of projects	Share of projects, %
Very efficient and relevant for productivity only	0%	0	0%
Less efficient and relevant for productivity only	25%	5	29%
Very efficient and relevant for productivity and resilience	11%	4	24%
Less efficient and relevant for productivity and resilience	64%	8	47%

Note: Investment projects implemented between 2010 and 2021 were categorized into four distinct groups. Very efficient is defined as having a budget execution rate exceeding 70 percent; less efficient is the contrary.

There is thus room to improve the budget efficiency of public agricultural spending in Paraguay, especially for investment projects managed by MAG. Overall, the execution rate of the public agriculture budget averaged 69 percent from 2010 to 2021, with a declining tendency observed in the last four years (Figure 112). Execution rates are particularly low for agriculture investment projects, which are solely executed by MAG. On average, only 57 percent of this budget was spent between 2010 and 2019,[148] although this was mostly driven by the earlier part of the period (Figure 113). By contrast, 90 percent of MAG's budget for administrative programs was spent over the same period.

Figure 112. The efficiency of overall public agriculture spending has been declining...

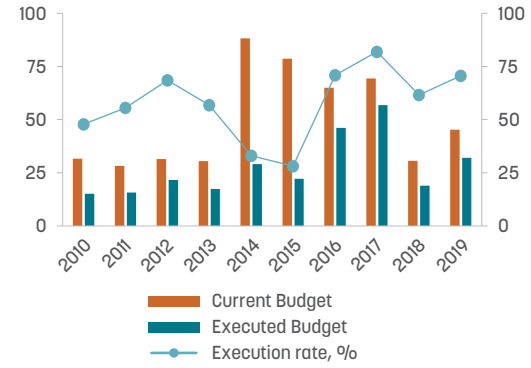
Current and executed budget,
USD millions / execution rate, percent



Source: MEF BOOST data.

Figure 113. ...although it has improved since 2015 for investment projects.

Current and executed budget,
USD millions/execution rate, percent



Source: MEF BOOST data.

Difficulties in executing the investment budget reflect institutional challenges, particularly in executing projects with external financing. According to consultations with MAG officials, the lack of a liaison for MAG in Congressional committees to expedite the processing of approvals[149]

[148] A modification in the budget structure in 2019 made it more difficult to assess the evolution of investment projects/programs in a consistent manner after this time.

[149] Unlike some public institutions, MAG does not have a legislative (technical) liaison to follow up on pending loan proposals under discussion by Congressional Committees. A liaison would continually inform the highest authorities of MAG about the status of these discussions so that they can intervene if needed.

associated with external financing is a key challenge. Externally-financed investment projects also frequently experience high turnover of key project management personnel, leading to delays. From the perspective of beneficiaries, accessing financing from MAG is also not straightforward. For example, rural organizations, who are often the target beneficiaries of investment projects, often lack the necessary documentation to access the funds. In many cases, family farmers and representatives of these organizations need to travel long distances to the capital to obtain this documentation, therefore incurring significant expenses. These organizations are also often not familiar with the specifications and conditions of public procurement, nor aware of modifications to these rules. As such, this causes delays in the disbursement of resources.

Among other institutions, INDERT has had the most challenges executing its budget. A key challenge to increasing the efficiency of family farming is to address the dire state of land cadaster services, which are managed by different institutions and have separate systems. However, INDERT only executed 64 percent of its allocated budget on average over the past decade (Table 9). According to Annual Public Management Balance Sheets (2014-2019), some explanations for this are: (i) delays in the bidding process and in subsequent awarding of bids for the provision of goods and services required by the institution, and (ii) frequent changes in the leadership of the institution, coupled with (iii) limited administrative and financial management capacity. Fortunately, budget execution by INDERT has improved in recent years.

Table 9. Budget execution rates vary from 64-85 percent across public agriculture agencies

Average budget execution rate, 2010-2021, percent (%)

Institution	Executed Budget
INDERT	64%
SENACSA	79%
SENAVE	79%
INFONA	81%
IPTA	85%

Source: MEF BOOST data, staff calculations.

How can the government of Paraguay increase the competitiveness and resilience of the agriculture sector?

Paraguay can enhance the competitiveness and resilience of the agriculture sector in many ways. This chapter showed that the Paraguayan government does not spend much on the agriculture sector relative to the economic importance of the sector. While increasing public spending on agriculture could in theory help to improve sector results, especially for family farmers, this is not currently feasible given the ongoing fiscal consolidation process (see Chapter 1). However, Paraguay can find ways to make better use of what it currently spends. Specifically, it can:

i. **Shift more public resources in the sector towards general services.** The government could consider investing more in general services that would benefit the sector more broadly, for example by:

- Strengthening and improving the provision of *agricultural extension services*, particularly for family farming and indigenous communities. This could be done by improving partnerships with regional producer organizations to provide services to family farmers, and by deploying technology. A pilot initiative by Dal Bó et al. (2021) in cooperation with MAG found that using monitoring devices induced more efforts by agricultural extension agents by reducing information gaps between agents and their supervisors.

- Directing more resources towards *agriculture research and development*. IPTA could play a more prominent role to identify, validate, and promote productive techniques that minimize environmental impacts while boosting productivity. These efforts could also lead to upgrading of primary products and thus help to promote income diversification. To that end, establishing collaborative mechanisms between IPTA and productive associations is critical. Such collaboration could be part of a national innovation agenda that helps the sector become more competitive and resilient.

ii. **Redouble efforts to ensure the quality of emerging and existing export products.** Implementing an enhanced national traceability system would provide evidence that Paraguayan beef is produced under sustainable production systems, hence making it more lucrative and globally competitive. Currently, producers can voluntarily participate in the SITRAP system to meet foreign market requirements, but a more comprehensive and mandatory traceability system is needed to access high-value markets, improve herd management, and ensure fair pricing. In that sense, the approval of Law 7221/23 to establish an Animal Identification System in Paraguay (SIAP) in December 2023 is an important step. Strengthened quality certification is also important to generate more revenue for other agriculture exporters, as evidenced by Paraguay's success in exporting organic sugar and chia. Streamlining the process of inspection and identifying gaps in sanitary and phytosanitary standards that prevent the export of agriculture goods would help Paraguay increase exports to advanced economies.[150]

iii. **Improve coordination within MAG and across all agriculture management institutions, as well as with other stakeholders.** To improve the efficiency of public spending on agriculture, especially on investments, it is essential to restructure and align key areas within MAG[151]. It is therefore notable that MAG has initiated a study to modernize its operations and develop a unified sectoral vision. This restructuring is expected to enhance policy and project implementation, strengthen the collaboration between farmers' organizations and MAG's autonomous entities, and improve their operational efficiency. As part of this process, MAG could also review its bureaucratic procedures to identify options for digitization and simplification. It could also work more effectively with regional government representations to support these rural organizations in accessing credit, land registration, and technical assistance.

[150] For example, exporting honey from the Chaco to European markets is currently impeded by the lack of quality certification protocols and a residue control program (Moriya et al. 2021).

[151] These include the Agrarian Extension Directorate (DEAg), Marketing Directorate, Agrarian Education Directorate (DEA), Risk Management Unit, Agricultural Census and Statistics Directorate (DCEA), and the National Coordination Directorate and Project Administration (DINCAP).

iv. **Mobilize private capital to leverage non-repayable investments from the public sector.** Most of MAG's investment programs focus on community-driven initiatives and do not crowd in private capital. Although there has been a recent shift towards projects that promote a more commercial approach (e.g., productive partnerships), the requirements for counterpart contributions (in kind or in cash) remain very low at around 10 percent of the total investment amount (World Bank 2016). It is therefore not possible to serve more beneficiaries due to the limited availability of public resources. To tackle this, the government could implement a strategy that channels working capital credits to family farmers and small producers through risk aggregators (e.g., processors, agrochemical distributors). This could be linked to specific programs of non-repayable contributions to promote access to, and adoption of, newer technologies that boost productivity, resilience, and sustainability. Moreover, the government could thoroughly review access to credit among family farmers. Better access to financing, coupled with effective knowledge transfers, could enable greater uptake of agricultural technologies among these groups.

v. **Develop and implement an effective agriculture risk financing strategy.** In order to improve the resiliency of the sector against droughts and other external shocks, which could increase in frequency and severity in the future due to climate change, it is suggested that the government prioritize the adoption of a climate risk financing strategy in the sector. There are various ways to do so, ranging from a simple approach based on macro-level parametric insurance or a more comprehensive approach that incorporates additional instruments, such as an agricultural insurance fund and contingent financing. In all scenarios, adopting a strategy is estimated to reduce the costs of disaster risk financing in Paraguay (World Bank 2023c).

vi. **Enhance security of land tenure.** Providing secure tenure to land will encourage farmers to invest in land-improving practices, help farmers obtain better credit by using it as collateral, and provide an insurance substitute in the event of an income shock (Fuglie et al. 2020). To that end, Paraguay could develop a reliable and modern rural cadaster. It could strengthen the *Sistema de Informacion de Recursos de la Tierra* (SIRT) by upgrading its platform to connect with other agencies' databases to expand the land titling regularization process for farmers.

vii. **More regularly collect information on the agriculture sector and use it to inform public policy making.** Gathering data pertaining to geographic location and social characteristics of various productive groups is essential for identifying and better targeting support by the government to the agriculture sector. Currently, there are long gaps between agricultural censuses, which were conducted in 2008 and 2022, in part due to their reliance on external funding. An institutional commitment to collect better and more regular data on the sector through censuses and other surveys, as well as adequate budgeting of resources to do so, is needed.

Table 10. Recommendations to increase the competitiveness and resilience of Paraguayan agriculture

Challenge	Recommendation
Highly volatile agriculture output growth due to external shocks leads to significant economic and social losses	Develop and implement a comprehensive strategy for agriculture risk insurance Expand access to long-term financing under flexible conditions, and complemented with the mobilization of private capital, so as to promote the use of technological innovations that boost resilience and productive efficiency in the agriculture sector Improve the reach of agriculture extension services
The need to increase the efficiency and profitability of the agriculture sector	Pass the necessary legislation to make traceability mandatory, paving the way to access higher-value markets, and strengthen the implementation of sanitary or phytosanitary measures for other agricultural exports Direct more resources toward/strengthen the role of IPTA, in partnership with the private sector, to develop technologies that can boost the sector's productivity and resilience while reducing the impact of droughts and other climate events Improve enforcement of existing legislation on land use change in the Eastern Region, and consider strengthening legislation in the Western Region to ensure sustainability of resources
High share of family farmers live in poverty or are vulnerable to poverty	Review requirements for family farmers and rural organizations to access state support Improve efficiency of execution of agricultural investment projects that are intended to support family farmers

References

ABC Color. 2022. "Paraguay, con Mayor Área de Siembra Directa en Sudamérica." ABC, August 03, 2022. https://www.abc.com.py/economia/2022/08/03/paraguay-con-mayor-area-de-siembra-directa-en-sudamerica/

Amoranto, Glenita, Douglas H. Brooks, and Natalie Chun. 2011. "Services liberalization and wage inequality in the Philippines." Asian Development Bank Economics Working Paper Series 239. http://hdl.handle.net/11540/1583

Apella, Ignacio and Guillermo Montt. 2024. "El sistema de protección de ingresos a las personas mayores en Paraguay. Aportes para mejorar la cobertura, equidad y sostenibilidad." International Labour Organization and World Bank. ILO Policy Research Paper 41. https://webapps.ilo.org/wcmsp5/groups/public/---americas/---ro-lima/---sro-santiago/documents/publication/wcms_917570.pdf

Aquino, Jesus. 2014. "Estimación de la Productividad Total de Factores de Paraguay: mediciones alternativas." Ministerio de Hacienda de Paraguay, Asunción, Paraguay.

Arce, Carlos and Diego Arias. 2015. "Paraguay Agricultural Sector Risk Assessment: Identification, Prioritization, Strategy and Action Plan." World Bank, Washington, DC. https://openknowledge.worldbank.org/server/api/core/bitstreams/d966f82a-0976-5595-b923-78841c0eb363/content

Ariu, Andrea. 2016. "Crisis-proof services: Why trade in services did not suffer during the 2008–2009 collapse." *Journal of International Economics* 98 (January): 138-149. https://doi.org/10.1016/j.jinteco.2015.09.002

Arnold, Jens M., Aaditya Mattoo, and Gaia Narciso. 2008. "Services inputs and firm productivity in Sub-Saharan Africa: Evidence from firm-level data." *Journal of African Economies* 17(4): 578-599. https://doi.org/10.1093/jae/ejm042

Arnold, Jens M., Beata S. Javorcik, and Aaditya Mattoo. 2011. "Does services liberalization benefit manufacturing firms?: Evidence from the Czech Republic." *Journal of International Economics* 85(1): https://doi.org/10.1016/j.jinteco.2011.05.002

Arnold, Jens M., Beata S. Javorcik, Molly Lipscomb, and Aaditya Mattoo. 2013. "Services Reform and Manufacturing Performance. Evidence from India." Policy Research Working Paper 5948. World Bank, Washington, DC. https://doi.org/10.1596/1813-9450-5948

Arráiz, Irani, Marcela Meléndez, and Rodolfo Stucchi. 2014. "Partial Credit Guarantees and Firm Performance: Evidence from Colombia." Small Business Economics 43 (February): 711-724. https://doi.org/10.1007/s11187-014-9558-4

Arvis, Jean-François, Gaël Raballand, and Jean-François Marteau. 2010. "The Cost of Being Landlocked: Logistics Costs and Supply Chain Reliability." World Bank Policy Research Working Paper 5258, World Bank, Washington, DC. http://documents.worldbank.org/curated/en/568341468332161137/The-cost-of-being-landlocked-logistics-costs-and-supply-chain-reliability

Aviomoh, Henry. 2023. "Growth Accounting Exercise for Paraguay, 1991 – 2019." Background paper, "From Landlocked to Land of Opportunity: Paraguay Country Economic Memorandum", World Bank, Washington, DC.

Ayyagari, Meghana, Pedro Juarros, Maria S. Martinez Peria, and Sandeep Singh. 2016. "Access to Finance and Job Growth: Firm-Level Evidence across Developing Countries." Policy Research Working Paper 6704. World Bank, Washington, DC. http://hdl.handle.net/10986/24146

Barone, Guglielmo and Federico Cingano. 2011. “Service Regulation and Growth: Evidence from OECD Countries.” The Economic Journal 121 (555): 931–957. https://doi.org/10.1111/j.1468-0297.2011.02433.x

Barro, Robert J. and Jong-Wha Lee. 2018. Dataset of Educational Attainment, June 2018 Revision. Accessed 20 July 2020. www.barrolee.com

Benavente, José M., Gustavo Crespi, and Alessandro Maffioli. 2007. “Public Support to Firm-Level Innovation: An Evaluation of the FONTEC Program.” OVE Working Papers 0507. Inter-American Development Bank, Office of Evaluation and Oversight (OVE). https://pdfs.semanticscholar.org/83a9/c0785d3bcaf799ec6d0b0dacefac609a4250.pdf

Benhassine, Najy, David McKenzie, Victor Pouliquen, and Massimiliano Santini. 2018. “Does Inducing Informal Firms to Formalize Make Sense? Experimental Evidence from Benin.” Journal of Public Economics 157: 1-14. https://doi.org/10.1016/j.jpubeco.2017.11.004

Bertelsmann Stiftung. 2022. “Bertelsmann Transformation Index 2022: Governance in International Comparison.” Gütersloh: Verlag Bertelsmann Stiftung. https://www.bertelsmann-stiftung.de/fileadmin/files/BSt/Publikationen/imported/leseprobe/1938_Leseprobe.pdf

Berthou, Antoine, and Charlotte Emlinger. 2011. “The Trade Unit Values Database.” International Economics 128. http://www.cepii.fr/CEPII/en/bdd_modele/bdd_modele_item.asp?id=2

Bertoni, Fabio, Julien Brault, Massimo G. Colombo, Anita Quas, and Simone Signore. 2019. “Econometric study on the impact of EU loan guarantee financial instruments on growth and jobs of SMEs.” EIF Working Paper 2019/54. https://www.eif.org/news_centre/publications/EIF_Working_Paper_2019_54.pdf

Bracco, Jessica R., Matías Ciaschi, Leonardo C. Gasparini, Mariana Marchionni, and Guido Neidhöfer. 2022. “The Impact of COVID-19 on Education in Latin America: Long-Run Implications for Poverty and Inequality (English).” Policy Research Working Paper 10259. World Bank, Washington, DC. http://documents.worldbank.org/curated/en/099836212122222999/IDU09453984e0f37404e7d09cf40e7a4fb25ac35

Brunstein, Jose. 2023. “Estudio de La Política Crediticia Nacional en el Contexto del Desarrollo Productivo Sustentable y Revisión de la Actual Regulación Financiera Como Factor Limitante de la Inclusión Financiera del Sector Primario.” IDB and Ministry of Agriculture and Livestock, Asunción, Paraguay.

Buckley, Ralf, and Alexandra Coghlan. 2012. “Nature-Based Tourism.” In The Routledge Handbook of Tourism and the Environment, eds. Andrew Holden and David Fennell. London, UK: Routledge, 334–344.

Calegari, Ademir, Augusto G. de Araujo, Tales Tiecher, Marie L.C. Bartz, Rafael Fuentes Lanilo, Danilo Reinheimer dos Santos, Facundo Capandegy et al. 2020. “No-till farming systems for sustainable agriculture in South America.” In No-till Farming Systems for Sustainable Agriculture, Edited by Y. Dang, R. Dalal, and N. Menzies. Springer, Cham. https://doi.org/10.1007/978-3-030-46409-7_30

Campello, Murillo, and Mauricio Larrain. 2016. “Enlarging the contracting space: Collateral menus, access to credit, and economic activity.” Review of Finance Studies 29(2): 349–383. https://doi.org/10.1093/rfs/hhv069

Campos, Francisco, Markus Goldstein, and David McKenzie. 2023. “How should the government bring small firms into the formal system? Experimental evidence from Malawi.” Journal of Developmental Economics 161. https://www.sciencedirect.com/science/article/abs/pii/S0304387822001870

Caunedo, Juanita and Elisa Keller. 2023. "Capital Embodied Structural Change." Working paper in progress. https://thedocs.worldbank.org/en/doc/7052f30bd4e1a273a9d9040c5774083a-0050022023/original/capitalembodiedsc-112022.pdf

Charotti, Carlos J., Carlos Fernández-Valdovinos, and Felipe Gonzalez Soley. 2021. "The monetary and fiscal history of Paraguay, 1960–2017." In A Monetary and Fiscal History of Latin America, 1960-2017, edited by Timothy J. Kehoe and Juan P. Nicolini. Minneapolis, MN: University of Minnesota Press. http://www.jstor.org/stable/10.5749/j.ctv27qzskq.14

Che, Natasha X. 2020. "Intelligent Export Diversification: An Export Recommendation System with Machine Learning." IMF Working Paper 2020/175. IMF, Washington, DC. https://www.imf.org/en/Publications/WP/Issues/2020/08/28/Intelligent-Export-Diversification-An-Export-Recommendation-System-with-Machine-Learning-49705

Cirera, Xavier, and William F. Maloney. 2017. The Innovation Paradox: Developing-Country Capabilities and the Unrealized Promise of Technological Catch-Up. World Bank, Washington, DC. https://elibrary.worldbank.org/doi/10.1596/978-1-4648-1160-9_ch1

Cirera, Xavier, Diego A. Comin, Marcio Cruz, and Kyung Min Lee. 2020. "Technology Within and Across Firms." NBER Working Paper 28080. National Bureau of Economic Research, Cambridge, MA. https://www.nber.org/system/files/working_papers/w28080/revisions/w28080.rev0.pdf

Conte Grand, Mariana, Paulina Schulz-Antipa, and Julie Rozenberg. 2023. "Potential exposure and vulnerability to broader climate-related trade regulations: an illustration for LAC countries." Environment, Development Sustainability. https://doi.org/10.1007/s10668-023-02958-y

Corden, W. Max, and J. Peter Neary. 1982. "Booming Sector and De-Industrialisation in a Small Open Economy." The Economic Journal 92, no. 368 (December): 825-848. https://www.jstor.org/stable/2232670

Costa Rica Tourism Board. 2002. Plan Nacional de Desarrollo Turistico Sostenible 2002-2012. San José. https://www.ict.go.cr/en/documents/plan-nacional-y-planes-generales/plan-nacional-de-desarrollo/plan-nacional-de-desarrollo-turistico-sostenible-actualizacion-2006/31-i-parte/file.html

Costa Rica Tourism Board. 2022. CST Tourism Sustainability. Acessed on 4 September 2022. https://www.ict.go.cr/en/sustainability/cst.html

Crespi, Gustavo, Alessandro Maffioli, and Marcela Melendez Arjona. 2011. "Public Support to Innovation: the Colombian COLCIENCIAS' Experience." IDB Social Sector Science and Technology Division Technical Notes No. IDB-TN-264. IDB, Washington, DC. https://publications.iadb.org/en/public-support-innovation-colombian-colciencias-experience

Cresta, Juan B., Gonzalo Muñoz, Carmine P. De Salvo, and Alvaro Garcia. 2018. "Análisis de políticas agropecuarias en Paraguay: Cuantificación de los apoyos al sector agropecuario 2009-2016." IDB. http://dx.doi.org/10.18235/0001587

Cusolito, Ana P., and William F. Maloney. 2018. Productivity Revisited: Shifting Paradigms in Analysis and Policy. World Bank, Washington, DC. https://elibrary.worldbank.org/doi/abs/10.1596/978-1-4648-1334-4

Dal Bo, Ernesto, Frederico Finan, Nicholas Y. Li, and Laura Schechter. 2021. "Information Technology and Government Decentralization: Experimental Evidence from Paraguay." Econometrica 89(2): 555-998. https://doi.org/10.3982/ECTA17497

Damania, Richard, Stephen Polasky, Mary Ruckelshaus, Jason Russ, Markus Amann, Rebecca Chaplin-Kramer, James Gerber, Peter Hawthorne, Martin Philipp Heger, Saleh Mamun, et al. 2023. Nature's Frontiers: Achieving Sustainability, Efficiency, and Prosperity with Natural Capital. World Bank, Washington, DC. https://doi.org/10.1596/978-1-4648-1923-0

Da Ponte, Emmanuel, Benjamin Mack, Christian Wohlfart, Oscar Rodas, Martina Fleckenstein, Natascha Oppelt, Stefan Dech, and Claudia Kuenzer. 2017. "Assessing Forest Cover Dynamics and Forest Perception in the Atlantic Forest of Paraguay, Combining Remote Sensing and Household Level Data." Forests, 8, 389. https://doi.org/10.3390/f8100389

Da Ponte, Emmanuel, Monserrat García-Calabrese, Jennifer Kriese, Nestor Cabral, Lidia Perez de Molas, Magali Alvarenga, Arami Caceres et al. 2022. "Understanding 34 Years of Forest Cover Dynamics across the Paraguayan Chaco: Characterizing Annual Changes and Forest Fragmentation Levels between 1987 and 2020." Forests, 13, 25. https://doi.org/10.3390/f13010025

David, Antonio. 2017. "Fiscal Policy Effectiveness in a Small Open Economy: Estimates of Tax and Spending Multipliers in Paraguay." IMF Working Paper No. 2017/063. IMF, Washington, DC. https://www.imf.org/en/Publications/WP/Issues/2017/03/22/Fiscal-Policy-Effectiveness-in-a-Small-Open-Economy-Estimates-of-Tax-and-Spending-44756

De, Prabir, and Ajitava Raychaudhuri. 2008. "Is India's Services Trade Pro-Poor? A Simultaneous Approach." Working Paper 16, United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP). https://artnet.unescap.org/markhub/WP/wp16.pdf

De La Torre, Augusto, Alain Ize, Federico Filippini, and Martin Sasson. "The commodity cycle in Latin America: mirages and dilemmas." World Bank Group, Washington, DC. https://documents.worldbank.org/en/publication/documents-reports/documentdetail/111551468184737421/the-commodity-cycle-in-latin-america-mirages-and-dilemmas

De Mel, Suresh, David McKenzie, Christopher Woodruff. 2008. "Returns to Capital in Microenterprises: Evidence from a Field Experiment." The Quarterly Journal of Economics, Vol. 123, No. 4, pp. 1329-1372. https://www.jstor.org/stable/40506211

De Mel, Suresh, David McKenzie, Christopher Woodruff. 2011. "Getting Credit to High Return Microentrepreneurs: The Results of an Information Intervention." The World Bank Economic Review, Volume 25, Issue 3, 2011, pp. 456–485. https://www.jstor.org/stable/41342485

De Mel, Suresh, David McKenzie, Christopher Woodruff. 2012. "One-Time Transfers of Cash or Capital Have Long-Lasting Effects on Microenterprises in Sri Lanka." Science, Vol 335, Issue 6071, pp. 962-966. https://doi.org/10.1126/science.1212973

Demirgüç-Kunt, Asli, Leora Klapper, Dorothe Singer, and Saniya Ansar. 2022. The Global Findex Database 2021: Financial Inclusion, Digital Payments, and Resilience in the Age of COVID-19. World Bank, Washington, DC. https://doi.org/10.1596/978-1-4648-1897-4

Elgin, Ceyhun, M. Ayhan Kose, Franziska Ohnsorge, and Shu Yu. 2022. "Understanding the Informal Economy: Concepts and Trends." Chapter in The Long Shadow of Informality: Challenges and Policies, eds. Franziska Ohnsorge and Shu Yu, World Bank, Washington, DC. https://doi.org/10.1596/978-1-4648-1753-3_ch2

European Commission. 2023. Questions and Answers: Carbon Border Adjustment Mechanism (CBAM). https://taxation-customs.ec.europa.eu/system/files/2023-07/20230714%20Q%26A%20CBAM_0.pdf

Faber, Benjamin, and Cecile Gaubert. 2019. “Tourism and Economic Development: Evidence from Mexico’s Coastline.” American Economic Review 109(6): 2245-93. https://www.aeaweb.org/articles?id=10.1257/aer.20161434

Fan, Tianyu, Michael Peters, and Fabrizio Zilibotti. 2023. “Growing like India: The unequal effects of service-led growth.” NBER Working Paper 28551, National Bureau of Economic Research, Boston, MA. https://www.nber.org/papers/w28551

FAO (Food and Agriculture Organization of the United Nations). “Global Forest Resources Assessment 2020: Main Report. http://www.fao.org/3/CA8753EN/CA8753EN.pdf

FAO 2022. “Government expenditures in agriculture 2001–2020.” FAOSTAT Analytical Brief 35. https://www.fao.org/3/cb8314en/cb8314en.pdf

Feal-Zubimendi, Soledad, and Juan P. Ventura. 2023. “El desafío de la formalización empresarial en Paraguay: causas, motivaciones y propuestas de política pública.” http://dx.doi.org/10.18235/0004814

Feenstra, Robert C., Robert Inklaar, and Marcel P. Timmer. 2015. “The Next Generation of the Penn World Table.” American Economic Review 105, no. 10 (October): 3150–3182. http://www.jstor.org/stable/43821370

Fields, Gary S., Timothy H. Gindling, Kunal Sen, Michael Danquah, and Simone Schotte. “The job ladder”, in Gary S. Fields and others (eds), The Job Ladder: Transforming Informal Work and Livelihoods in Developing Countries. Oxford Academic, 20 Apr. 2023, https://doi.org/10.1093/oso/9780192867339.003.0001

Fuglie, Keith, Madhur Gautam, Aparajita Goyal, and William F. Maloney. 2020. Harvesting Prosperity: Technology and Productivity Growth in Agriculture. World Bank, Washington, DC.

GAFILAT. 2022. “Mutual Evaluation Report of Paraguay.” https://www.fatf-gafi.org/content/dam/fatf-gafi/fsrb-mer/Mutual%20Evaluation%20Report%20of%20Paraguay-2022.pdf.coredownload.inline.pdf

Galeano, Luis A. 2012. “Paraguay and the expansion of Brazilian and Argentinian agribusiness frontiers.” Canadian Journal of Development Studies, 33(4): 458-470. https://doi.org/10.1080/02255189.2012.744301

Gautam, Madhur, Abdullah Mamun, Will Martin, and Rob Vos. 2022. Repurposing Agricultural Policies and Support: Options to Transform Agriculture and Food Systems to Better Serve the Health of People, Economies, and the Planet. World Bank, Washington, DC. http://hdl.handle.net/10986/36875

Ghassibe, Mishel, Maximiliano Appendino, and Samir E. Mahmoudi. 2019. “SME Financial Inclusion for Sustained Growth in the Middle East and Central Asia.” IMF Working Paper 2019/209. IMF, Washington, DC. https://www.imf.org/en/Publications/WP/Issues/2019/09/27/SME-Financial-Inclusion-for-Sustained-Growth-in-the-Middle-East-and-Central-Asia-48534

GI-TOC. 2023. “Índice global de crimen organizado 2023.” Geneva: Global Initiative Against Transnational Organized Crime. https://globalinitiative.net/wp-content/uploads/2023/09/I%CC%81ndice-global-de-crimen-organizado-2023.pdf

Gill, Alejandra, Emmanuel Da Ponte, Patricia Insfrán, and Raquel González. 2020. Atlas of the Paraguayan Chaco. WWF (World Wildlife Fund) and DLR (German Aerospace Center). Asunción, Paraguay. https://www.dlr.de/eoc/en/desktopdefault.aspx/tabid-14195/24618_read-70219/

Gordon, Robert J. 2012. “Is U.S. Economic Growth Over? Faltering Innovation Confronts the Six Headwinds.” NBER Working Paper 18315, National Bureau of Economics Research, Boston, MA. https://www.nber.org/papers/w18315

Greenwood, Jeremy, Zvi Hercowitz, and Per Krusell. 1997. “Long-run implications of investment-specific technological change.” American Economic Review 87(3): 342-362. https://www.jstor.org/stable/2951349

Hall, Robert E., and Charles I. Jones. 1999. “Why Do Some Countries Produce So Much More Output Per Worker Than Others?” Quarterly Journal of Economics 114(1): 83-116. https://doi.org/10.1162/003355399555954

Hartmann, Dominik, Mayra Bezerra, and Flavio L. Pinheiro. 2019. “Identifying smart strategies for economic diversification and inclusive growth in developing economies: The case of Paraguay.” Hohenheim Discussion Papers in Business, Economics and Social Sciences, University of Hohenheim, Germany. http://dx.doi.org/10.2139/ssrn.3346790

Henderson, James, Javier Godar, Gabriel Ponzoni Frey, Jan Börner, and Toby Gardner. 2021. “The Paraguayan Chaco at a crossroads: drivers of an emerging soybean frontier.” Regional Environmental Change 21, 72 (2021). https://doi.org/10.1007/s10113-021-01804-z

Hersbach, Hans, Bill Bell, Paul Berrisford, Gionata Biavati, András Horányi, Joaquín Muñoz Sabater, Julien Nicolas, Carole Peubey, Iryna R. Raluca Radu, D. Schepers, et al. 2018. “ERA5 hourly data on single levels from 1979 to present.” Copernicus Climate Change Service (C3s) Climate Data Store (Cds), 10 (10.24381). https://cds.climate.copernicus.eu/cdsapp#!/dataset/reanalysis-era5-single-levels?tab=overview

IDB (Inter-American Development Bank). 2019. Agricultural Policies Monitoring System. https://agrimonitor.iadb.org/en/

IMF (International Monetary Fund). 2022a. “Paraguay: 2022 Article IV Consultation – Press Release and Staff Report.” https://www.elibrary.imf.org/view/journals/002/2022/177/article-A001-en.xml

IMF. 2022b. Investment and Capital Stock database. https://data.imf.org/?sk=1CE8A55F-CFA7-4BC0-BCE2-256EE65AC0E4

IMF. 2023. “Paraguay: First Review Under the Policy Coordination Instrument and Request for Modification of Targets-Press Release; Staff Report.” IMF Country Report 2023/207, IMF, Washington, DC. https://www.imf.org/en/Publications/CR/Issues/2023/06/13/Paraguay-First-Review-Under-the-Policy-Coordination-Instrument-and-Request-for-Modification-534732

IMF. 2024. “Paraguay: Second Review Under the Policy Coordination Instrument, Request for an Extension of the Policy Coordination Instrument, Modification of Targets, Inflation Band Consultation, and Request of Arrangement under the Resilience and Sustainability Facility-Press Release; Staff Report; and Statement by the Executive Director for Paraguay.” IMF Country Report 2024/001, IMF, Washington, DC. https://www.imf.org/en/Publications/CR/Issues/2024/01/04/Paraguay-Second-Review-Under-the-Policy-Coordination-Instrument-Request-for-an-Extension-of-543244

INBIO. 2022. “Cultivos Genéticamente Modificados (GM) en la Agricultura Paraguaya.” https://www.inbio.org.py/informes/publicaciones/OGMParaguay_2022.pdf

INFONA (Instituto Forestal Nacional). 2022. “Nuestros Bosques: Reporte de la Cobertura forestal y cambios de uso de la tierra 2017 a 2020.” https://drive.google.com/drive/folders/1C-I5-1fBgQa55yFyR-aXacXIwPJl3kUC

Instituto Nacional de Estadistica de Paraguay (INE). 2023. Tecnología de la Información y Comunicación en el Paraguay 2015-2022. https://www.ine.gov.py/publication-single.php?codec=MjI2

Instituto Nacional de Estadistica de Paraguay (INE) and World Bank. 2023. Survey of Micro and Small Enterprises in Asunción and Central.

Izquierdo, Alejandro, Carola Pessino, and Guilhermo Vuletin. 2018. Better spending for better lives: How Latin America and the Caribbean can do more with less. Development in the Americas Flagship, Inter-American Development Bank, Washington, DC. http://dx.doi.org/10.18235/0001217-es

Jorgenson, Dale W., Frank M. Gollop, and Barbara M. Fraumeni. 1987. Productivity and Economic Growth. Cambridge, MA: Harvard University Press.

Kaufmann, Daniel and Aart Kraay. 2023. Worldwide Governance Indicators, 2023 Update. World Bank, Washington, DC. www.govindicators.org

Khanna, Mahima, Joshua Seth Wimpey, Miriam Bruhn; Sandeep Singh, Martin Hommes, and Aksinya Sorokina. MSME finance gap: Assessment of the shortfalls and opportunities in financing micro, small, and medium enterprises in emerging markets. World Bank Group, Washington, DC. http://documents.worldbank.org/curated/en/653831510568517947/MSME-finance-gap-assessment-of-the-shortfalls-and-opportunities-in-financing-micro-small-and-medium-enterprises-in-emerging-markets

Kim, Young Eun, and Norman V. Loayza. 2019. "Productivity Growth: Patterns and Determinants Across the World." World Bank Policy Research Working Paper No. 8852, World Bank, Washington, DC. https://documents1.worldbank.org/curated/en/130281557504440729/pdf/Productivity-Growth-Patterns-and-Determinants-across-the-World.pdf

Kose, M. Ayhan, Franziska Ohnsorge, Lei S. Ye, and Ergys Islamaj. "Weakness in Investment Growth: Causes, Implications and Policy Responses." Policy Research Working Paper 7990, World Bank, Washington, DC. https://documents1.worldbank.org/curated/en/267921488463293454/pdf/WPS7990.pdf

Latinobarómetro. 2023. "Informe Latinobarómetro 2023: La recesión democrática de América Latina." [Latin America's democratic recession]. 21 July 2023. https://www.latinobarometro.org/lat.jsp

Lederman, Daniel, and William F. Maloney. 2012. "Does What You Export Matter? In Search of Empirical Guidance for Industrial Policies." World Bank Research Observer 27, no. 2 (August): 220–246. http://documents.worldbank.org/curated/en/559871468339877324/Does-what-you-export-matter-In-search-of-empirical-guidance-for-industrial-policies

Lema, Daniel, and Nicholas Gatti. 2021. "Analysis of Agricultural Productivity in Paraguay: A Micro Econometric Approach." Paper presented at the International Conference of Agricultural Economists, August 17-31, 2021, virtual. https://ageconsearch.umn.edu/record/313804/files/Paper_18684_handout_561_0.pdf

Loayza, Norman V., and Steven Pennings. 2022. The Long Term Growth Model: Fundamentals, Extensions and Applications. World Bank, Washington, DC. http://www.worldbank.org/LTGM.

Loria Obando, Sofía, Nanno Mulder, and Janos Ferencz. 2022. The Latin American regulatory environment for digital trade." Economic Commission for Latin America and the Caribbean (ECLAC), Santiago. https://www.cepal.org/fr/node/58026

Loungani, Prakash, Saurabh Mishra, Chris Papageorgiou, and Ke Wang. 2017. "World Trade in Services: Evidence from A New Dataset." Working Paper 2017/077, International Monetary Fund, Washington, DC. https://www.imf.org/en/Publications/WP/Issues/2017/03/29/World-Trade-in-Services-Evidence-from-A-New-Dataset-44776

López-Córdova, Jose E. 2020. "Digital Platforms and the Demand for International Tourism Services." Policy Research Working Paper 9147, World Bank, Washington, DC. https://doi.org/10.1596/1813-9450-9147

MADES and UNDP. 2020. "Plan Estrategico del Sistema Nacional de Areas Protegidas de Paraguay (SINASIP) 2020-2030." Asunción: Proyecto Bosques para el Crecimiento Sostenible. https://www.researchgate.net/publication/355917375_Plan_Estrategico_del_Sistema_Nacional_de_Areas_Silvestres_Protegidas_de_Paraguay_SINASIP_2020-2030

Maloney, William F. 2004. "Informality Revisited." World Development, Vol. 32, No. 7, pp. 1159-1178. https://doi.org/10.1016/j.worlddev.2004.01.008

Marsden, Richard, Hans-Martin Ihle, and Peter Traber. 2018. "Effective Spectrum Pricing in Latin America: Policies to support better quality and more affordable mobile services." GSMA, London. https://www.gsma.com/spectrum/wp-content/uploads/2018/12/Effective_Spectrum_Pricing_in_Latin_America_full_report_ENG_web.pdf

McKenzie, David. 2021. "Small business training to improve management practices in developing countries: re-assessing the evidence for 'training doesn't work'." Oxford Review of Economic Policy 37(2): 276–301. https://doi.org/10.1093/oxrep/grab002

Mehta, Aashish, and Rana Hasan. 2012. "The effects of trade and services liberalization on wage inequality in India." International Review of Economics & Finance 23: 75-90. https://doi.org/10.1016/j.iref.2011.10.007

Milán, Maria J., and Elizabeth González. 2022. "Beef–cattle ranching in the Paraguayan Chaco: typological approach to a livestock frontier." Environment, Development and Sustainability 25 (March): 5185–5210. https://doi.org/10.1007/s10668-022-02261-2

Moriya, Henry Y., Nathalia Rodríguez, and Celso Gimenez. 2021. Asesoría Técnica al Ministerio de Agricultura y Ganadería: Identificando Oportunidades para el Fortalecimiento de Cadenas Agroalimentarias en Paraguay. World Bank, Washington, DC. http://documents.worldbank.org/curated/en/461961634256031339/Asesoría-Técnica-al-Ministerio-de-Agricultura-y-Ganadería-Identificando-Oportunidades-para-el-Fortalecimiento-de-Cadenas-Agroalimentarias-en-Paraguay

Morris, Michael, Ashwini R. Sebastian, Viviana M.E. Perego, John D. Nash, Eugenio Diaz-Bonilla, Valeria Pineiro, David Laborde, Thomas T. Chambers, Pradeep Prabhala, Joaquin Arias, et al. Future Foodscapes: Re-imagining Agriculture in Latin America and the Caribbean. World Bank, Washington, DC. http://documents.worldbank.org/curated/en/942381591906970569/Future-Foodscapes-Re-imagining-Agriculture-in-Latin-America-and-the-Caribbean

Nayyar, Gaurav, Mary Hallward-Driemeier, and Elwyn Davies. 2021. At Your Service?: The Promise of Services-Led Development. World Bank, Washington, DC. http://hdl.handle.net/10986/35599

Nin-Pratt, Alejandro, Heber Freiria, and Gonzalo Muñoz. 2019. "Productivity and efficiency in grassland-based livestock production in Latin America: the cases of Uruguay and Paraguay." IDB Working Paper No. 1024, IDB, Washington, DC. http://dx.doi.org/10.18235/0001924

Nin-Pratt, Alejandro. 2018. “Agriculture Growth, Efficiency, and Family Agriculture in Paraguay.” IFPRI Discussion Paper 01747, International Food Policy Research Institute, Washington, DC. https://www.ifpri.org/publication/agricultural-growth-efficiency-and-family-agriculture-paraguay

OECD (Organization for Economic Cooperation and Development). 2016. “OECD Producer Support Estimate and Related Indicators of Agricultural Support: Concepts, Calculations, Interpretation and Use (The PSE Manual).” OECD, Paris. https://www.oecd.org/agriculture/topics/agricultural-policy-monitoring-and-evaluation/documents/producer-support-estimates-manual.pdf

OECD. 2018. Multi-dimensional Review of Paraguay: Volume 2. In-depth Analysis and Recommendations. Chapter 2. OECD Development Pathways. OECD Publishing, Paris.

OECD. 2022. Agricultural Policy Monitoring and Evaluation 2022: Reforming Agricultural Policies for Climate Change Mitigation. OECD Publishing, Paris. https://doi.org/10.1787/7f4542bf-en

Pakko, Michael R. 2002. “What Happens When the Technology Growth Trend Changes? Transition Dynamics, Capital Growth, and the ‘New Economy’.” Review of Economic Dynamics 5(2): 376-407. https://www.sciencedirect.com/science/article/pii/S1094202502901699

Patiño Pena, Fausto. 2022. “Paraguay Exporter Analysis.” Background paper to “Accelerating Paraguay’s International Integration through Enhanced Trade, Investment and Competition Policies”, World Bank, Washington, DC.

Perry, Guilhermo, William F. Maloney, and Omar S. Arias. 2007. Informality: Exit and exclusion. World Bank, Washington, DC. https://doi.org/10.1596/978-0-8213-7092-6

Portes, Alejandro, Manuel Castells, and Lauren Benton. 1989. The informal economy: Studies in advanced and less developed countries. Baltimore, MD: The Johns Hopkins University Press.

Pricewaterhouse Coopers (PwC). 2018. “Maquiladora Regime in Paraguay: Benefits to obtain a competitive advantage.” https://www.pwc.com/py/es/publicaciones/assets/MaquilaRegimeEn.pdf

Ramirez Pastore, Carlos A., and Jason West. 2019. “Competition Barriers to Paraguayan Beef Exports: An Economic Review.” Studies in Agricultural Economics 121(1), no. 287547. https://EconPapers.repec.org/RePEc:ags:stagec:287547

Rivas Martínez, Gustavo I., Ministerio de Industria y Comercio, Ministerio de Trabajo, Empleo y Seguridad Social, Instituto de Previsión Social and Subsecretaría de Estado de Tributación. 2022. “Boletín sobre formalización y empleo de mipymes.” P. López-Fresno y M. Barreto (Eds.). Paraguay: Ministerio de Industria y Comercio. https://www.mipymes.gov.py/wp-content/uploads/2023/04/23-04-2023_Boletin-formalizacion-y-empleo-mipymes.pdf

Rojas, Luis D., and Pui Shen Yoong. 2022. “Labor income and informality across cohorts in Paraguay.” Background paper, “From Landlocked to Land of Opportunity: Paraguay Country Economic Memorandum”, World Bank, Washington, DC.

Romer, Paul. 1990. “Endogenous Technological Change.” Journal of Political Economy 98(5): S71-S102. http://www.jstor.org/stable/2937632.

Rosenblatt, David, Henry Mooney, Antonio Garcia Zaballos, Cloe Ortiz de Mendivil, Ariel McCaskie, Victor Gauto, Jason Christie, Jeetendra Khadan, and Nazera Abdul-Haqq. 2022. “Caribbean Quarterly Economic Bulletin: Digital Infrastructure and Development in the Caribbean.” Volume 10(3), IDB, Washington, DC. http://dx.doi.org/10.18235/0003914

Ruppert-Bulmer, Elizabeth, and Francesco Cuomo. 2018. “Paraguay Industry Prioritization for Delivering Better Job Outcomes.” Unpublished World Bank presentation.

Sierra, Ricardo, María Victoria Llorente, and Juan Pablo Guerrero. 2018. “FDI Flows in Paraguay: What Do Investors Prioritize?” Inter-American Development Bank Working Paper Series No. IDB-WP-961. IDB, Washington, DC. https://publications.iadb.org/en/fdi-flows-paraguay-what-do-investors-prioritize

Smith, Nicholas T. 2021. “Access to Finance in Paraguay: Analysis of the Enabling Environment.” Unpublished World Bank document.

Solow, Robert M. 1956. “A Contribution to the Theory of Economic Growth.” Quarterly Journal of Economics, 70(1): 65-94. https://doi.org/10.2307/1884513

Stads, Gert-Jan, Sandra Perez, Justo Lopez, and Nienke M. Beintema. 2016. “Paraguay: Agricultural R&D indicators factsheet.” IFPRI and Paraguayan Institute of Agricultural Technology, Washington, DC. http://ebrary.ifpri.org/cdm/ref/collection/p15738coll2/id/130302

Tinajero, Monica, and Gladys Lopez-Acevedo. 2010. “Mexico: Impact Evaluation of SME Programs Using Panel Firm Data.” Policy Research Working Paper 5186. World Bank, Washington, DC. https://elibrary.worldbank.org/doi/abs/10.1596/1813-9450-5186

Torrico, Bianca, and Juan P. Ventura. “La ciencia, la tecnología y la innovación echan raíces en Paraguay, ¿podemos hablar de una primavera científica en ese país?” IDB (blog). https://blogs.iadb.org/innovacion/es/la-ciencia-la-tecnologia-y-la-innovacion-echan-raices-en-paraguay-2/

Tyldesley, Maria. 2021. “Soy deforestation risk in Paraguay continues despite decline.” Trase. https://doi.org/10.48650/NM7G-XE62

United Nations World Tourism Organization (UNWTO). 2019. “Global Report on Women in Tourism, Second Edition.” https://www.unwto.org/publication/global-report-women-tourism-2-edition

UNWTO. 2022. Tourism Data Dashboard. https://www.unwto.org/tourism-data/unwto-tourism-dashboard

USDA. 2023. International Agricultural Productivity. https://www.ers.usda.gov/data-products/international-agricultural-productivity/

Van der Marel, E. 2012. “Trade in Services and TFP: The Role of Regulation.” The World Economy, 35: 1530-1558. https://doi.org/10.1111/twec.12004

Vandermerwe, Sandra, and Juan Rada. 1988. “Servitization of business: adding value by adding services.” European Management Journal 6(4): 314-324. https://doi.org/10.1016/0263-2373(88)90033-3

Villascusa Cerezo, Jose M. 2023. “Destination Unknown: Tapping into the potential of tourism in Paraguay.” Background paper, “From Landlocked to Land of Opportunity: Paraguay Country Economic Memorandum”, World Bank, Washington, DC.

WEF (World Economic Forum). 2019. “Global Competitiveness Report.” https://www.weforum.org/reports/global-competitiveness-report-2019/

WEF. 2022. “Travel and Tourism Development Index 2021.” https://www.weforum.org/reports/travel-and-tourism-development-index-2021/

Wegner, Enrico y Guannan Miao. 2022. “Recent trends in transport and insurance costs at disaggregated product level.” https://one.oecd.org/document/SDD/DOC(2022)2/en/pdf

World Bank. 2014. Export of Value Added database. https://datacatalog.worldbank.org/search/dataset/0039579#:~:text=The%20Export%20Value%20Added%20Database,years%20between%201997%20and%202011.

World Bank. 2016. Linking Farmers to Markets through Productive Alliances: An Assessment of the World Bank Experience in Latin America. World Bank, Washington, DC. https://doi.org/10.1596/25752

World Bank. 2017a. "Paraguay Jobs Diagnostic: The Dynamic Transformation of Employment in Paraguay." https://documents1.worldbank.org/curated/en/500641499411206696/pdf/117270-replacement.pdf

World Bank. 2017b. World Bank Enterprise Survey. Available at https://www.enterprisesurveys.org/en/data

World Bank. 2017c. "World Bank Enterprise Survey: Paraguay 2017 Country Profile." World Bank, Washington, DC. https://documents1.worldbank.org/curated/en/658201533638051849/pdf/129275-WP-PUBLIC-Paraguay-2017.pdf

World Bank. 2018a. "Paraguay – Systematic Country Diagnostic." World Bank Group, Washington, DC. http://documents.worldbank.org/curated/en/827731530819395899/Paraguay-Systematic-Country-Diagnostic

World Bank. 2018b. "The Effective Tax Burden on Investment." Unpublished World Bank document. March 2018.

World Bank. 2020. "A Forest's Worth: Policy options for a sustainable and inclusive forest sector in Paraguay." Country Forest Note, World Bank, Washington, DC. https://openknowledge.worldbank.org/server/api/core/bitstreams/2a289275-0c2d-50be-861e-9712c446c79e/content

World Bank. 2021a. The Changing Wealth of Nations 2021: Managing Assets for the Future. World Bank, Washington, DC. http://hdl.handle.net/10986/36400

World Bank. 2021b. The Human Capital Index 2020 Update: Human Capital in the Time of COVID-19. World Bank, Washington, DC. https://www.worldbank.org/en/publication/human-capital

World Bank. 2021c. Banking on Protected Areas: Promoting Sustainable Protected Area Tourism to Benefit Local Communities. World Bank, Washington, DC. http://hdl.handle.net/10986/35737

World Bank. 2021d. The Global Findex Database: Financial Inclusion, Digital Payments, and Resilience in the Age of COVID-19. World Bank, Washington, DC. https://www.worldbank.org/en/publication/globalfindex

World Bank. 2022a. Worldwide Governance Indicators. 2022 edition. https://info.worldbank.org/governance/wgi/Home/Reports

World Bank. 2022b. "Accelerating Paraguay's International Integration through Enhanced Trade, Investment and Competition Policies." World Bank, Washington, DC. http://hdl.handle.net/10986/38365

World Bank. 2023a. "Logistics Performance Index." World Bank, Washington, DC. https://lpi.worldbank.org/

World Bank. 2023b. "Joining Efforts for an Education of Excellence in Paraguay Project." Project Appraisal Document, World Bank, Washington DC. https://documents1.worldbank.org/curated/en/099040623154083853/pdf/BOSIB05ab2356609b0907c07f9e74bca5e1.pdf

World Bank. 2023c. “Cómo Hacer Frente a los Riesgos Hidrometeorológicos Que Afectan a la Agricultura Familiar en Paraguay?: Instrumentos de Financiamiento de Riesgos de Desastres.” World Bank, Washington, DC. https://documentos.bancomundial.org/es/publication/documents-reports/documentdetail/099062323115086993/p1791140921l5e0008e020dfdd82368b63.

World Bank. 2023d. “Entrepreneurship Database.” World Bank, Washington, DC. https://www.worldbank.org/en/programs/entrepreneurship

World Bank. 2024a. “Competition: The Missing Ingredient for Growth?” World Bank, Washington, DC. https://openknowledge.worldbank.org/bitstreams/5a4de9c0-52ef-4b3f-8592-249995492a9a/download

World Bank. 2024b. “Paraguay Country Climate and Development Report.” World Bank, Washington, DC.

World Intellectual Property Organization. 2022. “Global Innovation Index 2022: What is the Future of Innovation-driven Growth?” https://www.globalinnovationindex.org/gii-2022-report

WTO (World Trade Organization). 2017. “Trade Policy Review of Paraguay.” https://www.wto.org/english/tratop_e/tpr_e/tp460_e.htm

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