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List of Acronyms and Abbreviations

BTI  Bertelsmann Stiftung’s Transformation Index
CAGR Compound Annual Growth Rate
CAPDR Central America, Panama, and the Dominican Republic
CBOE Chicago Board Options Exchange
CEPA Center for European Policy Analysis
CEPAL Comisión Económica para América Latina y el Caribe (Economic Commission for Latin America and the Caribbean)
CGE Computable General Equilibrium
CICIG Comisión Internacional contra la Impunidad en Guatemala (International Commission against Impunity in Guatemala)
COG Country’s Opportunity Gain
COI Complexity Outlook Index
DVA Domestic Value Added
EAI Economic Activity Indicator
EAP East Asia and Pacific
ECA Europe and Central Asia
ECI Economic Complexity Index
EMDE Emerging and Developing Economies
ENIF Estrategias Nacionales de Inclusión Financiera (National Financial Inclusion Strategy)
EPU Economic Policy Uncertainty
FDI Foreign Direct Investment
FVA Foreign Value Added
GDP Gross Domestic Product
GVC Global Value Chain
HIC High-Income Countries
ICEFI Instituto Centroamericano de Estudios Fiscales (Central American Institute of Fiscal Studies)
ICT Information and Communications Technology
IDB Inter-American Development Bank
IEI Infrastructure Efficiency Index
ILO International Labour Organization
IMF International Monetary Fund
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<th>Acronym</th>
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<tr>
<td>IRF</td>
<td>Impulse-Response Function</td>
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<tr>
<td>LAC</td>
<td>Latin America and the Caribbean</td>
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<td>LAC-UMC</td>
<td>Latin America and the Caribbean Upper Middle Income Countries</td>
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<td>LAC-HIC</td>
<td>Latin America and the Caribbean High Income Countries</td>
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<tr>
<td>LMI</td>
<td>Low and Middle Income</td>
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<td>LTGM</td>
<td>Long Term Growth Model</td>
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<td>LTGM-PC</td>
<td>Long Term Growth Model Public Capital extension</td>
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<td>MDG</td>
<td>Millennium Development Goal</td>
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<tr>
<td>NEC</td>
<td>Not Elsewhere Classified</td>
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<tr>
<td>OAS</td>
<td>Organization of American States</td>
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<tr>
<td>OECD</td>
<td>Organisation for Economic Co-Operation and Development</td>
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<td>PCI</td>
<td>Product Complexity Index</td>
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<td>PWT</td>
<td>Penn World Tables</td>
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<td>RCA</td>
<td>Revealed Comparative Advantage</td>
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<td>R&amp;D</td>
<td>Research and Development</td>
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<td>SCD</td>
<td>Systematic Country Diagnostic</td>
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<td>SDG</td>
<td>Sustainable Development Goal</td>
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<td>TFA</td>
<td>Trade Facilitation Agreement</td>
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<td>TFP</td>
<td>Total Factor Productivity</td>
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<td>UNCTAD</td>
<td>United Nations Commission on Trade and Development</td>
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<td>USAID</td>
<td>United States Agency for International Development</td>
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<td>VAT</td>
<td>Value Added Tax</td>
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<td>WASH</td>
<td>Water Supply, Sanitation, and Hygiene</td>
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<td>WDI</td>
<td>World Development Indicators</td>
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<td>WEO</td>
<td>World Economic Outlook</td>
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<td>WGI</td>
<td>Worldwide Governance Indicators</td>
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<td>WIPO</td>
<td>World Intellectual Property Organization</td>
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<td>WoRLD</td>
<td>World Revenue Longitudinal Data</td>
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<td>WTO</td>
<td>World Trade Organization</td>
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Acknowledgments

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1. Introduction*

Sustained but modest economic growth in Guatemala since the late 1990s has been insufficient to offset the continuous decline in real GDP per capita since 1960, suggesting that further efforts are needed to promote growth. Guatemala, the largest Central American economy, has exhibited stable macroeconomic conditions over the last three decades, partly driven by lower budget deficits and public debt. However, the country is still marked by one of the longest and most violent civil wars in the world. For years, military expenditures crowded out spending on infrastructure, health, and education, adversely affecting Guatemala’s development path, especially in terms of poverty and inequality. Progress in macroeconomic stability and large remittance inflows have not been enough to accelerate growth. In addition, political fragmentation has risen over the years, despite the country’s democratic stability. Finally, foreign direct investment (FDI) is declining, likely due to the deterioration in the country’s business climate since 2015.

The objective of this study is to investigate the drivers and constraints of growth and productivity in Guatemala and explore areas with high growth potential. Drawing on the historical growth experience of Guatemala and employing a range of analytical tools, this country analysis aims to provide an in-depth study of the drivers and constraints of the country’s economic growth. The report first takes stock of the historical growth and macro performance of the country, before moving to a growth accounting exercise to understand the past drivers of the country’s growth. In the same vein, the subsequent section analyzes aggregate trends in productivity—the engine of long-term growth—and its relation to the process of structural transformation. The study then uses a cross-country benchmarking and panel data regression analysis based on the growth diagnostic developed by Hausmann et al. (2005) to identify the binding constraints to growth. Finally, the analysis presents the links between growth, diversification, and exports.

This analysis relies on a wide range of analytical tools, which are applied to each of the six countries in the study to enable cross-country comparisons. Several quantitative methods are employed to provide an objective assessment of the drivers and constraints of growth in Guatemala, including the long term growth model (LTGM), the computable general equilibrium model (CGE), growth diagnostics, and product space analyses. This same framework, analytical tools, and data are used for each Central American country to conduct a parallel analysis that enables meaningful cross-country comparisons. Therefore, given the wide breadth of the study, in terms of the methodologies used, subjects analyzed and countries covered, it does not aim to analyze in depth each driver and constraint of growth and provide granular policy recommendations. The core objective of this study is to inform the policy makers and other interested parties about the country’s strengths and weaknesses related to its growth, and to establish the analytical basis for subsequent investigations of specific areas.

Using these tools, the Guatemala report finds that boosting growth and reducing poverty require raising productivity growth, increasing investment, and facilitating the entry of women to the labor market. Results using LTGM show that closing the gaps with Guatemala’s aspirational peers in five determinants of total factor productivity (TFP) by 2035 could increase TFP on average by 1.7 percentage points relative to the baseline. This translates into an average annual gain in GDP per capita of 1.6 percentage points. An extension of the LTGM shows that increasing investment, particularly public investment, would accelerate growth, on average, by 1.3 percent. Finally, results from the CGE model show that increasing female labor force participation to reach half of that of men would increase GDP by 6.4 percent by 2030. Evidence presented in section three

* For all reports of “Unleashing Central America's Growth Potential” analytical body of work and the appendix, please see http://www.worldbank.org/boostcentralamerica.
Introduction shows that distortions reducing the mobility of workers across sectors are particularly large in Guatemala, and the removal of those distortions could translate into large output gains.

According to the growth diagnostics methodology, this report finds that the areas preventing faster growth are: (i) corruption, (ii) human capital, (iii) infrastructure, (iv) lack of innovation, and (v) security. Guatemala has performed poorly relative to its peers in several important dimensions, including security, financial depth, innovation, control of corruption, human capital, and infrastructure investment. The country is among the most violent countries in the world, where extortion, drug trafficking cartels, and non-state armed groups adversely impact business sentiment, migration, economic incentives, and social cohesion. Corruption levels are higher than in most of its peers and have worsened in recent years. Infrastructure investment in the country has also been declining in recent years. In addition, low public spending, low enrollment rates, and a lack of skilled workers have characterized the education system, resulting in the worst education outcomes in Central America. Guatemala shows a continuous downward trend in both research and development (R&D) expenditures and the innovation index. Given that most of these constraints are rooted in poor governance and weak institutions, reforms that improve transparency, accountability, and the rule of law will help diminish the constraints and facilitate growth.

Addressing the identified growth constraints can help Guatemala diversify its economy, reduce dependence on remittances, and transform the country from a consumption-driven economy into an export-oriented open economy. This study presents several paths for export diversification, including increasing the quality of products in which the country already has comparative advantages, in products such as bananas, coffee, sugar, palm oil, and cardamom. Three sectors provide a good balance between feasibility and strategic opportunities for diversification: i) metals, stone, and glass; ii) textiles and footwear; and iii) machinery, electrical, and transportation. Services also remain an area of great potential for job creation and growth: Guatemala could leverage its positive performance in information and communications technology (ICT) services by applying its homegrown talents to different industries. Strengthening the ICT sector is important not only as a source of growth, but also as a critical input for trade integration, private sector development, and public service delivery. Additionally, Guatemala has a potential in tourism, sea transport, and professional services, all sectors with comparative advantages.

Analysis has identified several key areas where policy reforms can help boost productivity and growth over the medium to long term. They include:

- **Investing in human capital through the lifespan and promoting access to services.** The country’s human capital indicators are similar to those of much poorer countries. Addressing the gaps in knowledge and skills will strengthen the productivity, flexibility, and innovative capacity of the labor force. Building human capital will also support the development of modern industries intensive in high-skilled workers, such as ICT, as well as less skill-intensive industries such as tourism.

- **Implementing measures to boost female labor force participation.** Educational and labor market policies that remove barriers and incentivize female labor force participation could have significant positive impacts on growth, productivity, and development in Guatemala.

- **Reducing labor market rigidities and costs.** A flexible labor market supports productivity growth by allowing factors of production to move freely across firms and sectors. Obstacles to migration within the country reduce labor flows from the agricultural sector to services and industry. Laws that make it more difficult to hire and fire workers also prevent reallocation of workers.

- **Boosting public investment to close infrastructure gaps.** Poor infrastructure in the country hinders economic growth, exacerbates poverty and inequality, and exposes the country to natural disasters. Large investment projects are needed, but require fiscal space and partnerships with the private sector.
Strengthening the institutional framework, including tackling corruption. Guatemala’s corruption level is particularly high when compared to its peers, and firms identified corruption as a major obstacle to their businesses. In addition, improving the institutional framework would facilitate product quality upgrading and improve the overall business environment.

Strengthening the business environment. Reforms should address areas that constrain small businesses, including the provision of security and access to financial services. Crime and violence impact the cost of doing business, affecting competitiveness and discouraging entrepreneurship and investment. Increasing the opportunity cost of engaging in criminal activities could be a first step, but reforms should also address the lack of opportunity that is generally at the heart of criminal activities.

Creating an enabling environment for innovation. Guatemala’s overall performance in innovation and R&D is one of the lowest in Central America, with a downward trend in R&D expenditure. Increasing human capital to foster innovation, strengthening the digital infrastructure of the country, and improving the business climate could generate an environment that encourages innovation to spur productivity.

Coordinating with the private sector to identify missing public goods and to design mechanisms to provide them. For those products that are not produced within the country but are sufficiently close to Guatemala’s existing capabilities, sectoral dialogue could be a solution to facilitate the emergence of new industrial clusters.
Guatemala is the largest economy in Central America, with a stable macroeconomic environment and modest but sustained economic growth since the late 1990s. With a population of 17.3 million and real GDP of US$ 54.5 billion in 2018, Guatemala is the largest economy in Central America, enjoying a stable macroeconomic environment and growth over the last three decades.\(^4\) Due to the stabilization policies of the Central Bank of Guatemala in the 1990s, inflation has gradually decreased from 41.2 percent in 1990 to 3.8 percent in 2018. Over the last three decades, Guatemala had the least volatile growth among its regional, structural, and aspirational peers.\(^5\) Public debt and the budget deficit have historically also been among the lowest and most stable globally, providing some resilience to external shocks.\(^6\) However, low tax revenues and significant rigidities in the execution of budget spending have limited public investment in infrastructure, critical social areas, and human capital, putting the developmental progress of the country at risk (Figure 1).\(^8\)

The growth performance of Guatemala from 1960–1996 was defined by one of the world’s longest and most violent civil wars.\(^9\) Growth fluctuated substantially during the first half of the civil war, before decreasing steadily from 5.2 percent in 1977 to -5.9 percent in 1982 at the height of the war (Figure 2). Only with the start of the peace process in the late 1980s did the growth rate revert back to a positive and more stable path. The conflict affected the country immensely on all fronts,\(^10\) particularly the period from 1979 to 1984, which was the most violent and destructive phase of the war. Increased spending on military expenses diverted resources away from health and education, while the destruction of public infrastructure and private properties belonging mostly to Mayan families in the west and northwest of the country cost more than six percent of GDP in the 1990s.\(^11\) The Commission for Historical Clarification in 1999 estimated the total direct cost of war from 1980–1989 as being the equivalent of zero production for nearly 15 months, or 121 percent of GDP in 1990. In per capita terms, the country has had a stable growth path in the 2000s and 2010s, with a brief interruption by the global financial crisis, averaging around 1.4 percent and registering 1.2 percent in 2018 (Figure 2 and Figure 3).\(^12\)

As a result of its modest economic performance, Guatemala’s real per capita output has fallen since 1960, compared to other countries. Guatemala’s GDP per capita relative to the United States has decreased substantially, from 8.3 percent in 1960 to 5.9 percent in 2017 (Figure 4). Furthermore, in 2018, Guatemala had the 5\(^{th}\) lowest real GDP per capita among 25 Latin American economies, while in 1960 it was the 7\(^{th}\) lowest among the same countries, before being outpaced by Paraguay and the Dominican Republic over the subsequent decades.\(^13\)

Guatemala’s dependence on commodity exports, among other factors, has been limiting its growth acceleration. Guatemala’s growth rate of real per capita output has been the lowest among its peers in the 1980s, 2000s, and 2010s, averaging -1.4, 1.1, and 1.4 percent, respectively. One of the reasons for the slow growth performance of the country is its high dependence on commodity exports. Despite agriculture’s decreasing share of GDP, the sector still employs 30 percent of the labor force as of 2019 and produces the country’s top export products. In 2017, commodity exports were 60 percent of total merchandise exports and 8.7 percent of GDP.\(^14\) Banana, coffee, sugar, and palm oil have traditionally been the top export products of the country, reaching a 30 percent share of total exports in 2017. High dependence on commodity exports limits the country’s gains
from trade, due to their low price and income elasticity, lower value added and scalability, and their exposure to shocks from both the supply side (such as weather conditions) and the demand side (that is, sudden shifts in demand). The collapse of coffee prices in 2000–2001, which was mainly due to an increase in coffee production in Brazil and Vietnam, caused the growth rate of per capita output to slump from 1.5 percent in 1999 to -0.02 percent in 2001. The growth rate did not recover until 2006.

Figure 1. Guatemala’s government debt vs. tax revenue

Figure 2. GDP per capita growth of Guatemala (%)

Figure 3. GDP per capita growth by decade (%)

Figure 4. Guatemala’s per capita GDP relative to U.S.

Inequality and extreme poverty decreased substantially between 1990 and 2001, before the drought and coffee crisis that left thousands of workers in rural areas unemployed and increased the poverty rate. Before the 1990s, Guatemala’s poverty and other social indicators were similar to those of Haiti, despite its higher GDP per capita, as a result of low tax revenue that limited the government’s ability to invest in social areas. Poverty reduction in the 1990s increased with the 1996 Peace Accord, which set higher target levels of
public and social investment and increased transfer programs with funds freed from defense expenses. As a result, extreme poverty decreased from 35 percent in 1990 to about 9 percent in 2000. However, with mass unemployment in rural areas stemming from a decrease in coffee production due to the drought of 2001 and the collapse in coffee prices in 2000–2001, extreme poverty increased again to 11 percent from 2001–2007, before reverting to 8 percent in 2015 (Figure 5). Similarly, inequality, measured by the Gini coefficient, decreased from 60 percent in 1990 to 48 percent in 2015, with a slight increase from 2001 to 2007 (Figure 4). However, the gap between the poor and the non-poor is still large, as a result of differences in access to basic services such as electricity, water and sanitation, especially in rural areas and among the indigenous population.

Remittances have been the largest financial flows to Guatemala since the early 1990s, and since the mid-2000s have been followed by Foreign Direct Investment (FDI). The first large increase in remittance inflows to Guatemala took place in 2002, when remittances rose from 3.36 to 7.7 percent of GDP, following large FDI outflows from the country in 2000 and 2001. Remittances continued to increase until reaching 12.42 percent of GDP in 2007 (Figure 6). From 2008 to 2017, remittances remained at around 10 percent of GDP, then surged again to 12.1 percent in 2018. From 2004 onwards, FDI inflows ranged between 1.34 to 2.52 percent of GDP, replacing official development assistance as the second largest financial flow to the country. The last decade saw the largest inflows of FDI (around 2 percent of GDP), mainly to the commerce, manufacturing, and energy sectors, though Guatemala still lags behind its structural and aspirational peers in terms of FDI. Both remittances and FDI play a key role in financing the current account deficit of the country. Remittances are also crucial for financing consumption and keeping poverty at bay.
The analysis of the role of factor accumulation and productivity in economic growth, a method known as growth accounting, helps to explain Guatemala’s recent economic history of stagnation. Economic theory states that countries grow by accumulating factors of production, such as capital and labor, and by increasing the efficiency in their use. International experience indicates that at low levels of development, countries can increase production by increasing the use of their factors. However, given the existence of diminishing returns on capital accumulation, the sustainable way of growing in the long term comes from improving efficiency in the use of factors.

By identifying the factors that drove economic growth in the past, growth accounting sheds light on the areas of the economy that could be improved to foster economic growth in the long run.

In the past 50 years, Guatemala’s economic growth model has been primarily based on factor accumulation, especially labor adjusted for quality of education. An analysis of the decomposition of GDP growth shows that Guatemala’s growth was mainly due to factor accumulation, or more labor and capital, with total factor productivity (TFP) having a negative or negligible contribution. In the period 1970–2017, growth averaged 3.8 percent. During that time, labor (number of working people and human capital) accumulation was the main contributor to growth, accounting for 62 percent of growth, whereas capital accumulation accounted for 37 percent. During the period 1991–2017, the contributions of labor and capital moved in different directions: From 1991–2000, labor accounted for 67 percent and capital 30 percent, while in 2011–2017, labor increased to 93 percent and capital decreased to 22 percent (Figure 7).

Low levels of capital formation and domestic savings in Guatemala may explain the reduced role of capital as a source of economic growth. Gross domestic savings has significantly declined in the past seventeen years, from 9.8 percent of GDP in 1990 to 2.5 percent of GDP in 2017. Guatemala has lower levels of gross capital formation (around 15 percent of GDP) than all its regional, structural, and aspirational peers. The low investment rate observed in Guatemala was mainly due to lack of both public and private initiatives: FDI averaged one percent of GDP per year in the period 1990–2017. Public investment averaged 2.6 percent of GDP per year in 1990–2017, compared with averages of 5.9 percent and 5.3 percent per year for structural and aspirational peers, respectively. Public investment is also low when compared to Latin America and the Caribbean (LAC) and Central American peers, which averaged 6.8 percent and 4.0 percent, respectively, for the same period. Likewise, private investment lagged when compared to regional, structural, and aspirational peers (Figure 8).

Low productivity growth has been a drag in helping Guatemala achieve higher levels of per capita income. For the period 1950–2017, the growth of TFP averaged 0.04 percent and showed significant fluctuations over time. It was almost zero during the 1950s and 1970s, while it contributed an average of 2 percent per year during the 1960s. In the 1980s, TFP growth significantly declined (an average annual decrease of 1.3 percent) as a result of the internal turbulences coming from the civil war (Figure 7). However, the return of democracy in the mid-1980s failed to bring productivity growth to positive terrain, and TFP continues to be the main impediment to closing the income gap with high-income countries.
Low TFP growth is reflected in Guatemala’s labor productivity, which only outpaced other LAC countries. Labor productivity is a measure closely linked to TFP, which is calculated as value added per worker.\textsuperscript{30} Between 1992 and 2018, value added per worker in Guatemala grew less than in its structural and aspirational peers, Organisation for Economic Co-operation and Development (OECD) countries, and Central American countries (Figure 9). Unlike the increase observed in aspirational countries, Guatemala’s labor productivity has been stagnant since 2008. While Central American peers, aspirational peers, OECD countries, and structural peers (Bolivia, El Salvador, Honduras, Nicaragua, Paraguay and Senegal) continued to increase labor productivity, Guatemala was not able to return to its pre-2008 performance. In the period since 2008, the gap in labor productivity between Guatemala and OECD countries improved slightly, from a gap of 12 percent to 11.7 percent. On the contrary, since 2013, labor productivity in aspirational peers has been rising faster than in OECD countries, thereby closing the productivity gap between them.

Increasing investment, particularly public investment, would have strong positive effects on growth and poverty in Guatemala.\textsuperscript{31} Poor infrastructure in the country hinders economic growth. However, low tax revenues and significant rigidities in the execution of budget spending have limited public investment. However, the large economic returns of new investments however, highlight the necessity to improve tax collection to generate fiscal space to perform undertake those investments. Based on simulations using a Long-Term Growth Model (LTGM), an increase in public investment from its current level (below the 25th percentile of lower-middle income [LMI] countries) to the 75th percentile of LMI countries (9 percent of GDP), could boost growth by 1 percentage point over 2020–30 (Figure 10).\textsuperscript{32} An increase in public investment to the 90th percentile of LMI countries (12 percent of GDP) increases growth by 1.3 percentage points over 2020–30.\textsuperscript{33} Private investment has a similarly large effect on GDP growth. Increasing it from its current level to 21 percent (75th percentile of LMI countries) boosts growth by 0.75 percentage points over 2020 and increasing it to 26 percent (the 90th percentile across LMI countries), boosts growth by 1.2 percentage points. The effects of increasing investment rates on
poverty are also large: in the proposed scenarios, poverty can drop between 3 and 4 percentage points by 2030. The poverty rate of US$ 5.5/day is still expected to be very high—at around 40 percent—so these drops would be 7.5–10 percent of the baseline poverty rate at that time. The poverty rate is still high in 2030 in part because of high current poverty rates (almost 50 percent), but also because baseline economic growth of 1.5–2 percent per capita only barely dents poverty.

**Figure 9. Labor productivity over time, 1991–2017; 1991=100**

**Figure 10. Real GDP growth rate under different scenarios of public investment**


**Increasing Female labor force participation would have strong positive effects on growth.** Female labor force participation in Guatemala is currently at 40 percent, the lowest in Central America (with an average of 43 percent) and well below that of men (83 percent). Educational and labor market policies that remove barriers and incentivize female labor force participation could have significant positive impacts on growth, productivity and development in Guatemala. In addition, introducing more economic support for parents such as early childhood education and childcare services, and addressing gender norms that perpetuate disparities could boost female participation. Based on simulations using a computable general equilibrium (CGE) model, increasing women’s labor force participation to reach half that of men would gradually boost labor supply and is estimated to increase GDP by 6.8 percent. Traditional labor-intensive industries (textiles and wearing apparel) as well as labor intensive services sectors (public administration and business services) are shown to benefit the most. Higher levels of activity would encourage investment (both domestic and foreign) in Guatemala, estimated to increase by 11.2 percent by 2030. Households would also benefit through an increase in household income and consumption, estimated to increase by 5.4 percent by 2030.

**3.1. How would reforming the drivers of TFP affect growth?**

A counterfactual scenario where Guatemala achieves the levels of TFP drivers in its aspirational peers provides some insights for the country’s growth potentials. As widely cited in both the theoretical and empirical literature, TFP—also referred to as technical progress—is the main driver of the long-term growth rate of an economy. Here an extended LTGM, drawing on the latest available data, is used to quantify how an increase in the determinants of TFP, which include innovation, education, market efficiency, infrastructure, and institutions, affects the long-term growth rate of Guatemala. In each of these five indicators, Guatemala underperforms its aspirational peers and the United States (see Appendix III for details). This points to the need for reforms in these areas in order to promote the country’s long-term growth.

The goal of the reform scenario is to reach the levels of Guatemala’s aspirational peers in each determinant of TFP by 2035. To implement these reforms, it is assumed that each TFP determinant increases linearly so that by 2035 the country reaches the target (Table 1). This scenario generates a path of TFP that follows an inverted U-shape, rising from a growth rate of 0.6 percent in 2020 to a maximum of 2 percent by 2031, and then declining gradually over time. On average, the growth rate of TFP between 2019 and 2035 is 1.7 percent per year,
which is almost 1.2 percentage points higher than in the baseline scenario (0.5 percent). Annual GDP per capita growth would be 1.6 percentage points higher that the baseline and the poverty rate could be 17 percentage point lower than in the baseline.

The above evidence suggests that Guatemala needs to raise TFP growth in order to boost GDP per capita and sustain poverty reduction. Guatemala’s growth has been mainly driven by a factor accumulation, with productivity having a disappointing performance. While the contribution of labor has been increasing over time since 1991, the contribution of physical capital has declined. In fact, low levels of investment and domestic savings in Guatemala may explain the declining role of capital as a source of growth. To double its GDP per capita in the next 15 years, Guatemala would need to grow at 4.7 percent annually. In order to meet this target, raising productivity growth is key to boost growth rates of income per capita and sustain poverty reduction over time. In the past decades the country has been unable to experience sustained TFP growth, which indicates the necessity to introduce reforms consistently over time to generate a significant change in TFP. The experience from Asian countries shows that maintaining TFP growth over time is possible but requires political will to remove constraints and distortions affecting markets. Given that Guatemala lags in all the determinants of TFP, efforts to close the gap in the short run will be important to reach higher TFP growth. As discussed in more detail in Section Four below, improving the financial system, promoting innovation and business environment through better security, controlling corruption, and closing the infrastructure gap would help Guatemala step up its productivity and growth. Before moving to the analysis of key areas constraining growth in Guatemala, the next section investigates the determinants of the TFP dynamics in the country.

Table 1. TFP reform scenario

<table>
<thead>
<tr>
<th>Determinant</th>
<th>GTM</th>
<th>Aspirational peers</th>
<th>Target year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Innovation</td>
<td>1.7</td>
<td>8.9</td>
<td>2035</td>
</tr>
<tr>
<td>Education</td>
<td>20.4</td>
<td>53.0</td>
<td>2035</td>
</tr>
<tr>
<td>Efficiency</td>
<td>52.1</td>
<td>71.2</td>
<td>2035</td>
</tr>
<tr>
<td>Infrastructure</td>
<td>39.8</td>
<td>49.7</td>
<td>2035</td>
</tr>
<tr>
<td>Institutions</td>
<td>45.6</td>
<td>49.8</td>
<td>2035</td>
</tr>
</tbody>
</table>

Source: World Bank staff elaboration.
4. Aggregate Trends in Productivity and Structural Transformation

4.1. Employment composition and structural change

As countries develop, they move resources away from agriculture to industry and services. This process is known as structural transformation. The structural transformation literature establishes that as an economy grows, the following patterns emerge:

1. The employment share and nominal value-added share in agriculture declines.
2. The employment share and nominal value-added share in services rise.
3. Industry follows a hump-shaped path: the employment share and the value-added share of industry rise at early stages of development, eventually reach a peak, then decline as the economy grows.

Guatemala’s economic expansion was accompanied by a shift in the sectoral composition. Figure 11 displays the evolution of nominal sectoral shares of GDP for agriculture, industry, and services. Agriculture’s share of GDP (left panel) steadily declined from almost 15 percent at the beginning of the 1970s to 11 percent in recent years. The industry share (right panel) followed the standard hump-shape, peaking in the 1980s and sharply declining over time as the economy grew, reaching a share of GDP of less than 28 percent. In the case of services, the share of value added in the 1970s was close to 31 percent, peaked in the 1980s at 36.5 percent, and has declined since then to reach approximately 27 percent today.

At the same time, Guatemala experienced a large shift in the structure of employment across sectors. In 1991, more than 37 percent of workers were in agriculture, with the remaining workers employed in services (36 percent) and industry (24 percent). By 2018, the employment share of agriculture shrank to 29 percent, with workers reallocating toward services and industry. The employment share of services grew to 49 percent and that of industry declined to 22 percent (Figure 11). The movement of workers away from agriculture to industry and services is consistent with a long tradition in development economics, in which poor countries undergo a process of structural change, where labor reallocates from traditional, low-productivity sectors of the economy toward modern, high-productivity sectors to achieve high levels of aggregate productivity. The next sections study in greater detail whether this reassignment of workers went to higher productivity sectors.
4.2. Sectoral labor productivity growth

Guatemala's sectoral productivity growth in agriculture, industry, and services was lower than it was in its aspirational and OECD peers in all three sectors. The process of structural change is characterized, among other things, by differences in the pattern of productivity growth across sectors and countries, as illustrated by many studies. The relationship between the average growth rate of labor productivity in each sector and the initial level of aggregate labor productivity for Guatemala and a set of peers is depicted in Figure 12. The dotted blue line shows the average growth in labor productivity for OECD countries in each sector. Between 1991 and 2017, agricultural labor productivity grew on average 1.1 percent each year, which is lower than OECD countries and lower than structural, aspirational, and LAC peers, even though Guatemala started from a lower level of aggregate productivity. A similar pattern emerges when looking at industry and services: labor productivity growth in the period 1991–2017 was lower than the average in Central America and the average of aspirational peers and OECD countries, but higher than the average labor productivity growth in LAC peers. When compared to structural peers, the growth rate of Guatemala was higher in industry, but lower in services. These low levels of sectoral productivity growth are behind the lack of labor productivity convergence with rich countries previously documented.

Source: World Bank staff elaboration using data from WDI.

Note: Value added, constant 2010 US$. Source: World Bank staff elaboration using data from WDI.

Figure 12. Sectoral labor productivity growth, 1991–2017

Source: World Bank staff elaboration using WDI.
Box I. Drivers of premature deindustrialization in Guatemala since 2001

Deindustrialization has captured the attention of academics due to systematic differences in the paths followed by today’s developed countries, in contrast to today’s developing countries. Rodrik (2016) points out that the reallocation of resources from industry into services is starting for today’s developing countries at lower levels of development and at lower peaks than evidenced by developed nations. This premature deindustrialization, in general, is a policymaking concern, as industrialization is often considered to be an engine of growth. This view contends that robust industrial growth is essential for developing countries to catch up with the developed world, and premature deindustrialization strips an economy of one of the fundamental drivers of growth.45

In a background paper for this report, Sinha (2019a) investigates the relative strength of different forces in shaping the behavior in industrial employment in the region using a model that links the production in one sector to the production of other sectors and countries. In this model, employment in a sector is affected by three channels: i) domestic consumption; ii) net exports; and iii) labor market distortions restricting the flow of labor between sectors. While the first two forces increase sectoral employment, the third one contracts it. These distortions are important to account for the differences in labor productivity observed in the data.46

In Guatemala, the industrial share of employment contracted by 3.2 percentage points between 2001 and 2016. This decline is more than the regional average. To understand how much each channel contributed to the actual change in employment, the model is used to perform the following counterfactual: what would be the industrial employment share in 2012 if all variables were kept fixed at the initial year of analysis, except for the variable that corresponds to the channel of interest? Figure I provides the results of this exercise. As in other regional peers, changes in distortions are the principal channel driving down the industrial employment. On the other hand, consumption and trade, both individually and jointly, created opportunity for an expansion in industrial employment. The latter alone implies an increase of 1.8 percentage points. Still, such changes are not strong enough to offset the impact born by changes in productivity gaps.

When compared to its neighbors, and based on model estimates, Guatemala has one of the highest levels of labor market distortions in both industry and services. Like most Central American economies, the services sector experiences larger distortions relative to industry, and both sectors faced higher barriers in hiring labor in 2017 compared to what they faced in 2001. The model estimates the inefficiency cost of rising distortions to be just under a percent of the aggregate output in 2001 (Figure II). Elimination of these distortions that weakened structural change implies an output gain of 3.1 percent, above the average gains for the region.

Figure I. Decomposition of changes in employment share

Note: The blue bar represents the actual change in employment shares. The pink bars depict the counterfactual change in employment shares when the variables pertaining to a factor are changed, keeping all the other variables fixed at the initial levels.

Figure II. Estimates of labor market distortion

Source: Sinha (2019a). Note: Circles (●) and squares (□) denote the labor market distortions in industry and services, respectively. An increase in the value of the distortion in a given sector means that it is costly to workers to reallocate from agriculture to that sector.
Guatemala still has growth-enhancing reallocation possibilities that could be exploited. Empirical evidence shows that there tend to be large differences in productivity at the firm level within sectors, and between sectors. In addition, these gaps tend to be larger in developing countries than in advanced economies, indicating the presence of distortions that affect the allocation of resources between sectors and thus reduce aggregate productivity. However, large productivity gaps across sectors could potentially increase aggregate productivity, if workers reallocate from a sector with low productivity to a sector with high productivity. The labor productivity gap between the least productive sector (agriculture) in 2016 and the most productive sectors is large: utilities are 18.6 times more productive; financial intermediation, real estate, and business activities are 11.5 more productive; and mining is 10.4 times more productive. Some sectors have reduced their gaps relative to agriculture, indicating that productivity growth across sectors is uneven. For example, the wholesale, retail, restaurants, and hotels sector closed the productivity gap with agriculture by 1.4 percentage points, and the construction sector reduced the gap by 1.2 percentage points, which is desirable from a structural change point of view. Unfortunately, that was not the rule but an exception: most sectors have increased their labor productivity gaps since 1991, indicating that there are still opportunities for the reallocation of resources out of agriculture (Figure 13). It is important to highlight the fact that in developing countries, labor markets are segmented, which implies that there are distortions preventing the mobility of workers between sectors. Box 1 in this report shows that removing those barriers translates into important output gains. The next section examines the contribution of structural transformation to aggregate labor productivity.

**Figure 13. Change in sectoral gap relative to agriculture 1991–2016**

<table>
<thead>
<tr>
<th>Sector</th>
<th>Change in the productivity gap</th>
</tr>
</thead>
<tbody>
<tr>
<td>Utilities</td>
<td>-2</td>
</tr>
<tr>
<td>Transport, Storage and Communications</td>
<td>0</td>
</tr>
<tr>
<td>Financial Intermediation, Real Estate, Business Activities</td>
<td>2</td>
</tr>
<tr>
<td>Mining &amp; Quarrying</td>
<td>4</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>6</td>
</tr>
<tr>
<td>Education, Health, Social Work, other services</td>
<td>8</td>
</tr>
<tr>
<td>Construction</td>
<td>10</td>
</tr>
<tr>
<td>Wholesale, Retail, Restaurants and Hotels</td>
<td>12</td>
</tr>
<tr>
<td>Public Administration</td>
<td>-2</td>
</tr>
</tbody>
</table>

Source: World Bank staff elaboration using WDI.

**4.3. Sectoral labor productivity growth and structural transformation**

Changes in GDP per capita (or value-added per capita) can come from four sources: (i) demographic changes, (ii) changes in labor force participation and employment levels, (iii) changes in sectoral productivity (within-sector component), and (iv) the reallocation of labor across sectors (between-sector component). This last component is typically known in the literature as structural change or structural transformation. Furthermore, the structural transformation component can be decomposed into a “static” and “dynamic” component. While the “static” component measures whether workers move to sectors with above-average productivity, the “dynamic” component measures whether productivity growth is higher in sectors with an increase in employment.

Guatemala experienced three decades of moderate growth in value added per capita, with a declining role of labor productivity. Per capita value-added growth decelerated from an annual average of 1.8 percent in 1991–2000 to 1.2 percent in 2001–2010, and then showed a moderate recovery of 1.4 percent in 2011–2017. A Shapley decomposition of per capita value-added growth between labor productivity and employed labor force indicates that labor productivity growth was the main driver of per capita value-added growth in 1991–2017, contributing 51 percent of the total change. However, labor productivity has shown a very uneven evolution
over time: While it contributed 68 percent of the 1.8 percent increase in per capita value-added growth from 1991–2000, its contribution has been only 4 percent in recent years. This drastic decline in productivity dynamism was mitigated by demographic factors and employment. In particular, thanks to a demographic dividend that allowed the entry of young people to the labor market, the increase in the working-age population helped maintain a moderate growth in per capita value added (Figure 14). From 1991 to 2000, the change in the working-age population contributed 46 percent to per capita value-added growth, which increased to 69 percent in the period 2001–2010 and remained at a similar level after 2011.

The decline in labor productivity reflects weakening within-sector productivity growth. The decomposition of labor productivity in its “within” and “between” components highlights that between 1991 and 2017, sector-level productivity growth was the main driver of labor productivity, but it followed a declining path over time. In the 1990s, within-sector productivity growth on average grew at a rate of 4.7 percent a year, but the reallocation of workers was toward sectors that were experiencing negative productivity growth (negative dynamic reallocation). As a result, labor productivity grew only 1.2 percent in that period. By 2011–2017, the within-sector contribution to labor productivity growth turned negative, but employment movements across sectors contributed to overall productivity growth (Figure 15).

Reallocations of employment between sectors contributed negatively to productivity growth in the period 1991–2017. As discussed, labor productivity was the main driver of growth in value added per capita in the period 1991–2017, with a rate of 0.7 percent a year, and a contribution of 51 percent to the growth in value added per capita. However, the reallocation of workers component (that is, the structural transformation) of the growth in labor productivity declined at an average rate of 0.6 percent, reducing the positive effect of the within-sector growth in productivity. When broken down by decades, the contribution of structural change was always negative, however: from 1991–2000 it contributed negatively with -3.5 percentage points per year, but in 2001–2010 it contributed 0.4 percentage points per year, which grew to 1.5 percentage points per year in 2011–2017 (Figure 15).

Labor reallocation from manufacturing and high-productivity services towards low-productivity services was the principal source of labor productivity losses from structural shifts. Figure 16 shows changes in employment shares and the relative productivity of sectors, measured as the log of the ratio between sectoral productivity and average productivity between 1991 and 2016. Positive structural change occurs when: (i) workers move to relatively high-productivity sectors, or when (ii) workers move out of relatively low-productivity sectors. In the case of Guatemala, workers reallocated from sectors with above-average productivity (manufacturing and transport, storage and communications) and moved toward sectors with below-average productivity (construction and wholesale, retail, education, and health), reducing aggregate productivity.
The movement of workers out of agriculture has contributed to overall productivity growth in Guatemala, although the shift has not been as striking as in many peers. Figure 16 shows that there is also some positive reallocation, from low-productivity agriculture toward high-productivity services (financial intermediation and real estate and utilities), but this reallocation is not strong enough to counterbalance the decline in productivity that occurred from 1991–2016. In particular, the employment moving out of agriculture shifted to services, which is a largely informal sector with low productivity. While labor productivity is higher in the service sector than in agriculture, it is still low relative to peer countries, which limits the positive contribution of the structural shift to economy-wide productivity growth.

**Figure 16. Change in average employment share, and deviation from average labor productivity, ratios**

Guatemala also has a large informal sector, where most workers have much lower productivity. Despite a rapid decline in informal employment (proxied by self-employment) in recent years, Guatemala remains one of the Central American countries with the highest level of informal output (see the cross-cutting report). The informal sector in Guatemala accounted for 46–48 percent of GDP in 2016, with informal and self-employment occupying 80 percent and about 32 percent of total employment, respectively (Figure 17). The GDP share of informal output in Guatemala exceeds the average share of informal output in other emerging markets and developing economies by about 14 percentage points of GDP. In addition, output in the informal sector of Guatemala remains higher than the average share of output in the informal sector in OECD and in aspirational peers by around 20 and 17 percentage points of GDP, respectively.

Figure 17. Informality in Guatemala

**A. Informal output**

<table>
<thead>
<tr>
<th>Region</th>
<th>Percent of GDP</th>
</tr>
</thead>
<tbody>
<tr>
<td>GTM</td>
<td>40</td>
</tr>
<tr>
<td>Central America</td>
<td>30</td>
</tr>
<tr>
<td>LAC (excl. CA)</td>
<td>25</td>
</tr>
<tr>
<td>EMDEs (excl. CA)</td>
<td>20</td>
</tr>
<tr>
<td>Aspirational peers</td>
<td>15</td>
</tr>
<tr>
<td>Structural peers</td>
<td>10</td>
</tr>
<tr>
<td>OECD</td>
<td>5</td>
</tr>
</tbody>
</table>

**B. Informal employment**

<table>
<thead>
<tr>
<th>Region</th>
<th>Percent of employment</th>
</tr>
</thead>
<tbody>
<tr>
<td>GTM</td>
<td>80</td>
</tr>
<tr>
<td>Central America</td>
<td>60</td>
</tr>
<tr>
<td>LAC (excl. CA)</td>
<td>50</td>
</tr>
<tr>
<td>EMDEs (excl. CA)</td>
<td>40</td>
</tr>
<tr>
<td>Aspirational peers</td>
<td>30</td>
</tr>
<tr>
<td>Structural peers</td>
<td>20</td>
</tr>
<tr>
<td>OECD</td>
<td>10</td>
</tr>
</tbody>
</table>


Notes: DGE (MIMIC) = DGE-(MIMIC-) based estimates on informal output as a percent of official GDP. SEMP (INFEMP) = self-employment (informal employment) as a percent of total employment. Data are from the latest year available (2016 for DGE, MIMIC, and model-based SEMP estimates).
5. Growth Diagnostics Analysis

Drawing on the growth diagnostics analysis of Hausmann et al. (2005), this section investigates the constraints to Guatemala’s investment and growth. The analysis is carried out in two steps: in the first step, 18 areas of Guatemala’s economy are assessed, using 138 indicators from 2000 to 2018, to identify the areas where the country has a poorer performance than its structural and aspirational peers. Each indicator is first standardized to range from 0 to 100, with higher values referring to stronger favorable outcomes, which are then averaged to create aggregate indexes proxying the performance of each of the 18 areas. In the second step, the relationship between economic performance indicators and the six areas where the country has the weakest performance relative to its structural and aspirational peers is analyzed. As seen in Figure 18 that presents the scores in 18 areas of Guatemala’s economy compared to its structural and aspirational peers, Guatemala has the lowest relative values in security, financial sector—particularly in financial depth and bank competition—innovation, corruption, human capital, and infrastructure. The remainder of this section provides an analysis of these indicators and their association with real GDP per capita of Guatemala, to evaluate whether and to what extent they constrain the economic performance of the country.

Figure 18. Growth diagnostics indicators of Guatemala, 2000-2018

![Figure 18. Growth diagnostics indicators of Guatemala, 2000-2018](image)

Source: See Table 5.1 in the Appendix for methodology and the source of all indicators.

5.1. Security

Guatemala is among the most violent countries in the world together with El Salvador and Honduras. During 2000–2018, there were 35 homicides for every 100,000 people, on par with structural peers such as El Salvador and Honduras, but nearly six times higher than its aspirational peers (Figure 19). With average scores of 81 in its fragile state index and 7 in its security threat index over 2000–2018, Guatemala performs worse than
all of its peers. The country managed to reduce the homicide rate from 45.4 in 2009 to 26.1 in 2017 (Figure 20), which was still the third highest rate in Central America after El Salvador (62) and Honduras (42).53 Much of this decline is explained by a drop in the male homicide rate from 84.4 in 2009 to 39.1 in 2018.54 The female rate has declined more slowly, from 10.0 to 6.4.55 Moreover, in 2018, Guatemala’s fragile state score, at 82, was the highest in Central America, followed by Honduras (77), Nicaragua (75), and El Salvador (71).

Crime in Guatemala, as in many other Latin American countries, is highly concentrated: 6 out of Guatemala’s 22 departments account for 63.7 percent of its homicides.56 Extortion is one of the most common crimes and the major financing source for gangs in Guatemala. Both regular people and businesses are targeted and this type of crime is rarely prosecuted. Public transport is among the sectors most affected by extortion: between 2010 and 2016, 484 bus drivers were killed in the capital.57 Also worrisome are the links between drug trafficking cartels and mining and hydroelectric projects for territorial control, accompanied by corruption around public resources, and the proliferation of non-state armed groups engaging in drug and human trafficking and violence.58 Between January 2014 and October 2015, there were 1,173 reported murders of women. Domestic violence and crimes against women are still under recorded.59

According to the 2017 Enterprise Surveys, Guatemala’s cost of crime and losses due to crime are among the highest of its peers. Firms in Guatemala experience the highest losses due to theft in products during shipment (at 3.3 percent of product value) and the second highest losses due to theft and vandalism (4 percent of firms’ annual sales), as well as paying the third highest security costs (at 2.8 percent of annual sales) compared to Guatemala’s peers (Figure 21). Similarly, the percentage of firms experiencing losses due to theft and vandalism is the highest among the comparator groups, while the percent of firms identifying crime, theft, and disorder as a major constraint and the percent of firms paying for security are the second highest after El Salvador (Figure 22).
In 2017–2018, the World Economic Forum (WEF) ranked Guatemala 134 out of 151 countries in terms of the business cost of crime. This ranking is slightly higher than Honduras (135) and El Salvador (137), and way below Chile (86) and Panama (74). Crime and violence impact the cost of doing business, migration, uncertainty, incentives, and social cohesion, among other things, and thus reduce competitiveness, discourage entrepreneurship and investment, and slow down job creation. In Guatemala, El Salvador, and Honduras, crime and violence have been the main drivers of high migration rates, depleting human capital capacity. The regression analyses also show that crime and violence are significant constraints to Guatemala's growth. The results of the fixed effects regression analysis of GDP growth with respect to security index, and the set of controls, show that a one-point increase in the security threat index is associated with a 1.5 percent decrease in the growth rate of output in Guatemala.

Figure 21. Cost of crime at the firm level in 2017

Figure 22. Share of firms incurring losses due to crime in 2017

5.2. Corruption

Guatemala's corruption level is higher than all of its peers except for Nicaragua and Honduras. In all three indicators of corruption—control of corruption, corruption perception, and freedom from corruption—Guatemala scores much lower (meaning worse on corruption) than its aspirational peers and many LAC countries (Figure 23). Moreover, its corruption environment has worsened during recent years (Figure 24). The International Commission against Impunity in Guatemala (CICIG) was created in 2007 to fight against corruption and closed in 2019. Together with the Attorney General of Guatemala, CICIG identified 60 criminal networks...

Figure 23. Corruption indicators, 2000–2018

Source: WDI, Transparency International and Heritage Foundation.
and prosecuted more than 100. As seen in Figure 24, the freedom from corruption index started improving in 2007, with the establishment of CICIG, and continued until 2011. It then suffered a steep decline but recovered again in 2015, when the emblematic La Línea corruption was uncovered. The La Línea scandal, which was investigated by CICIG and led to the resignation of the President, is estimated to have cost the country 1.8 percent of its GDP in 2015, equivalent to around a quarter of the country’s 2015 health expenditures.

Corruption is a much higher obstacle to businesses in Guatemala than in many other countries in Central America and LAC. In 2017, 69 percent of the firms in Guatemala identified corruption as a major obstacle to their businesses, the highest among all of its peers, followed by Honduras with 65 percent (Figure 25). Similarly, 38 percent of firms in Guatemala identified partiality of courts as a major obstacle for their businesses, the second highest among Guatemala’s peers. In other corruption indicators, Guatemala performs better than its regional peers. For instance, the percentage of firms experiencing at least one bribe payment request in Guatemala is 3 percent, while in Honduras and the rest of LAC it is 9 percent (Figure 26). It seems that not all areas of the public sector are similarly affected by corruption: While two percent of firms are expected to give gifts to get an electrical connection, six percent are expected to give gifts to obtain a construction permit (which is below the LAC average and most CA countries).

Reducing corruption is positively associated with GDP growth in Guatemala. Fixed effects regression analysis shows that a one percentage point increase in the freedom from corruption index is associated with a 0.08 percent increase in the growth rate of GDP. Similarly, cross-sectional regression results suggest a strong positive relationship between reducing corruption and GDP per capita for the whole sample included in the analysis. Compared to other economies with the same level of corruption, Guatemala has a lower GDP per capita, which implies that there are other obstacles, in addition to corruption, preventing the country from increasing its per capita GDP.
5.3. Infrastructure

5.3.1. Physical infrastructure
Poor and inadequate physical infrastructure has been identified as one of the major constraints to growth and development in Guatemala. World Bank reports from 1951 to 2015 have consistently pointed to infrastructure as one of the major constraints to Guatemala’s development. While other Latin American countries have been closing the gap to reach their infrastructure requirements, in Guatemala the gap seems to have been widening. Infrastructure investment in the country has been declining over recent years, from 3.1 percent of GDP in 2008 to 0.6 percent in 2015 (compared to the Latin American average of 3.7 percent in 2015).

Inadequate infrastructure in Guatemala is caused by decreasing public investment in infrastructure, an unfavorable geographical location that exposes the country to natural disasters, and corruption and lack of transparency. Recent cases of public fraud prosecuted by CICIG and the prosecutor’s office involve prominent private sector representatives. Increasing the fiscal space and revenue mobilization, supplemented with measures to improve efficiency and flexibility (in the areas of public procurement, the wage bill, and targeted transfers), as well as encouraging private sector participation would contribute to reducing the infrastructure gap. Guatemala’s Public-Private Partnership law represents a step forward toward increasing private sector participation to mobilize additional financing for investment in infrastructure.

The investment gap is reflected prominently in some of Guatemala’s infrastructure indicators. Guatemala scores much lower than its peers in the delivery of basic public services (3 out of 7) and the quality of its railroads (1 out of 7) (Figure 27). Although somewhat better, the quality of Guatemala’s ports is still worse than LAC high-income countries and way behind G7 countries, with a score of 4 out of 7 (Figure 27). Guatemala’s port infrastructure has been evaluated as poor, expensive, and inefficient, particularly on the east coast of the country, which is the exit point for products exported to the United States. This weakness has led to a loss of productivity and limitation of agribusiness exports, especially of fruits and vegetables.

Guatemala performs better than many of its peers with regards to the quality of its road and air transport, but it lags behind with regard to the quality of railroads and public services. With scores of 4 (roads) and 5 (air transport) out of 7 in terms of quality, Guatemala outpaces its structural and middle-income regional peers and is on par with its aspirational peers and high-income LAC peers (Figure 27). However, according to a recent IMF report, the transport of goods and people to ports and other destinations runs at an average speed of 37 kilometers per hour, which is considerably slower than the international average speed of 60 kilometers per hour. In terms of coverage, the road network system of about 16,457 kilometers only provides close to 1 meter of roads per inhabitant, and 151 meters per square kilometer (compared to the average values of 3.7 meters per inhabitant and 413 meters per square kilometer in six Central American countries and Dominican Republic).
Furthermore, the quality of the country’s railroads and public services are the lowest among all comparator economies, with a score of 1 out of 7 in the quality of railroads and 3 out of 10 in the quality of public services (Figure 27).

**Access to electricity and water in Guatemala is modest compared to its peers, and the quality of electricity and transport services is much poorer than that of many of its peers.** During 2000—2018, only 83 percent of the population had access to electricity, considerably lower than its aspirational peers (with 96 percent) and LAC upper-middle-income countries (with 94 percent) and just above its structural peers. Although there are wide disparities between rural and urban areas and across geographical regions, the electricity supply is the only infrastructure that has grown and improved significantly in recent years. According to the Enterprise Surveys conducted in 2017 (Figure 28), less than 15 percent of firms identify electricity as a major constraint, compared to more than 35 percent in LAC countries. However, 54 percent of firms experience electrical outages, higher than all of Central America except Honduras. Moreover, nearly 20 percent of firms identify transportation as a major constraint: Guatemala has the highest rate of broken/spoilt products during shipping among its peers (Figure 29). Data also show that 12 percent of firms experience water insufficiencies, compared to 13 percent in LAC and Costa Rica and 20 percent in the rest of Central America.

**Figure 28. Access to and quality of electricity, 2017**

![Graph showing access to and quality of electricity, 2017](image1)

Source: Authors' computation using data from Enterprise Surveys Guatemala 2017, World Bank Group and sources shown in Table 5.1 in the Appendix.

**Figure 29. Access to and quality of transport, 2017**

![Graph showing access to and quality of transport, 2017](image2)

Source: Authors' computation using data from Enterprise Surveys Guatemala 2017, World Bank Group and sources shown in Table 5.1 in the Appendix.

**Higher quality of ports and railroads is associated with higher growth in Guatemala.** Econometric analysis shows that a one index point increase in the quality of port and railroad infrastructure is associated with a 6 percent and 0.5 percent increase in the real GDP growth rate of Guatemala, respectively. Cross-sectional analysis also indicates a strong positive relationship between the quality of ports and GDP per capita. Put together, these findings suggest that investment in infrastructure is likely to result in significant productivity gains and long-term growth.
5.3.2. Digital infrastructure
Guatemala has one of the highest mobile penetration rates among LAC countries, with an average of 82 subscribers per 100 people between 2000 and 2018 (Figure 30). In 2018 alone, there were 140 subscribers per 100 inhabitants in the country, which is much higher than the regional average of 114. The number of mobile phone users is 8.6 times larger than that of landline users, and 93 percent of total mobile phone use is via prepaid network services. The increase in telecommunication investment and the number of mobile phone operators significantly contributed to this explosive growth of mobile phone usage. Notwithstanding the expansion of mobile use, both internet users (at only 13 percent of population) and international internet bandwidth per user (with 11 Mbps) in Guatemala are the lowest among all comparator economies (Figure 30 and 31).

Figure 30. Digital infrastructure, 2000–2018

Figure 31. International internet bandwidth, 2000–2018

Source: Authors’ computation using data from WDI and other sources shown in Table 5.1 in the Appendix. Note: International Internet Bandwidth (Mbps) is the contracted capacity of international connections between countries for transmitting Internet traffic.

Figure 32. Broadband subscription vs. Real GDP per capita

Source: Authors’ computation using data from WDI and other sources shown in Table 5.1 in the Appendix. Figure 32 is from the cross-sectional regression analysis of real GDP per capita (log) that controls for investment, human capital, labor participation, income category and regions. N: 167 countries, period: 2000-2018.
Guatemala’s GDP growth rate is closely linked to the change in broadband and fixed broadband internet subscriptions. Specifically, a one-unit increase in broadband subscriptions per 100 people is associated with a 0.20 percent increase in the growth rate of GDP in Guatemala. There is also a strong positive association between broadband subscriptions and GDP per capita across 167 countries (Figure 32). Other indicators of digital infrastructure are not significantly related to GDP growth or are negatively associated with GDP per capita. These results suggest that investing in broadband infrastructure is likely to promote economic performance in Guatemala.

### 5.4. Human capital

Guatemala’s public spending on education is the lowest in Central America, resulting in the lowest education outcomes. At 2.75 percent of GDP in 2017, public spending on education in Guatemala is the lowest of its peers, equal to nearly half the average spending on education in LAC (Figure 33). Although 12 years of education is compulsory in Guatemala, most children are only expected to stay in school for 10 years. Learning-adjusted years of school is only six years: two years shorter than the LAC upper-middle-income average and three years shorter than the average of its aspirational peers (Figure 34). The National Literacy Committee reported 12 percent illiteracy nationwide in 2016 and about 6 percent of the population enrolled in primary education stopped attending school.” Globali, leaving school early is associated with poor working conditions and worse health conditions, and is overrepresented among those who commit and suffer crimes.

![Figure 33. Public spending on education (% of GDP), 2000-2018](chart1)

**Guatemala Asp. Peers LAC HIC**  
2.9 4.1 4.7 4.9 4.9 5.1

![Figure 34. Years of schooling and primary completion rates, 2000-2018](chart2)

**Guatemala Str. Peers LAC UMIC Asp. Peers**  
9.7 10.3 11.6 12.1 12.3 12.6

Source: Authors’ computation using data from WDI.

Although Guatemala’s primary school enrollment rate is on par with other economies, its enrollment rates in high school and tertiary education are among the lowest. Only 46 percent of eligible children in Guatemala are enrolled in secondary education, which is 22 and 35 percentage points less than its structural and aspirational peers, respectively (Figure 35). The enrollment rate drops to 17 percent when people reach tertiary education—3 percentage points less than the rate for structural peers but 37 percentage points lower than that for aspirational peers. Financial constraints are the leading cause of low enrollment rates, particularly at the secondary level. While preschool (aged 5–6) and primary education is publicly funded, secondary schooling is mostly private. That the country has only one public university also constrains access to education and contributes to inequality. Furthermore, education outcomes vary substantially across administrative departments, ethnicities, and urban versus rural areas, due to high levels of segregation. For instance, the department of Quiche, with one of the highest concentrations of indigenous populations, has the lowest literacy rate at 62.9 percent, compared with 91.4 percent in the department of Guatemala. Years of schooling for poor students...
and those from rural areas are approximately half of those of students from urban areas and the wealthy.84

As in many countries in Latin America, distribution of teachers' wages in Guatemala is compressed, making the profession comparatively less attractive.85 The average student-teacher ratio in primary school in Guatemala over 2000–2018 was the 12th highest among the 94 countries for which data is available, at 27 students per teacher, following Honduras (30), Nicaragua (33), and El Salvador (36), and above Costa Rica (19) and Panama (23).86 As seen from Figure 36, there is a strong negative relationship between student-teacher ratio and test scores. This negative association can also be observed among most Central American countries: those with a higher student-teacher ratio than Guatemala also have lower scores than Guatemala, which has an average test score of 405 (out of a range of 300–625), such as Honduras (400), Nicaragua (392), and El Salvador (362). The reverse also proves true, as evidenced by Costa Rica (430). However, since 2006, the number of students per teacher in Guatemala has been decreasing steadily, dropping to 20 in 2017 from 32 in 2000.87

An insufficient supply of skilled workers is shown to hamper trade and limit FDI inflows in Guatemala.88 Consistent with this finding, according to the Enterprise Surveys of Guatemala conducted in 2017, 32.5 percent of firms in Guatemala identified an inadequately educated workforce as a major constraint, just below Honduras (35 percent), but way above Nicaragua (17 percent), El Salvador (26 percent), and the Europe and Central Asia (ECA) average (18 percent). This is a widespread problem in LAC, with an average of 31.9 percent of firms identifying an inadequately educated workforce as a major constraint. Results of the fixed effects regression analysis of GDP growth with respect to various human capital indicators suggest that an increase in human capital indicators (that is secondary and tertiary enrollment rate, primary completion rate, share of female students, youth and general literacy rate, life expectancy, percentage of women in parliament and teacher-student
growth diagnostics analysis

5. Growth diagnostics analysis

5.5. Innovation

Guatemala’s overall performance in innovation and research and development (R&D) is one of the lowest in Central America. From 2000–2018, it scored 29 on the innovation index, just above its structural peers, but far below its aspirational peers (Figure 37). Its low R&D expenditure, at 0.05 percent of GDP, is in line with this low output: it exceeds only Honduras in the region, is less than half of its structural peers, and comes to only a quarter of the LAC high-income countries average. Consistent with the low research budget, the number of full-time researchers is also low. In 2012, there were 26.7 researchers per million inhabitants, three times less than the number of researchers the country had in the 1980s, 16 times less than the Latin America average, and 262 times less than developed countries. Thus, in four decades, the population of researchers decreased by 70 percent.

During 2000–2018, Guatemala had only one patent application by a resident per million of population, which is below all of its peers (Figure 38). In 2018, the number of patents filed by residents was 6, compared to the 228 applications of non-residents, which means that residents make up only 2.6 percent of patent applications. According to the World Intellectual Property Organization (WIPO) in 2014, 57 percent of registered patents in high-income countries came from resident companies; in middle-income countries that figure is close to 52
percent, and in low-income countries it is only 20 percent. However, in the case of Latin America, even countries considered to be middle-income (Argentina, Mexico, Brazil) show low patent registration among their resident firms.94

More worrying is the continuing downward trend of both R&D expenditure and innovation index of the country over time (Figures 39 and 40). Low capacity of innovation in Guatemala is linked to low-quality education outcomes. The results of the 2017 PISA test show several weaknesses in the quality of the school system in Guatemala: 70 percent of 15-year-old students perform below the basic level in reading, while the Latin American average is 52 percent and the OECD average is 20 percent. In science, 77 percent of the students in Guatemala perform below the basic level, while 89 percent of students perform below the basic level in mathematics. In Latin America, 58 percent and 69 percent of students perform below the basic level in science and mathematics, respectively.95 Furthermore, business owners in Guatemala have fewer years of formal education than their peers in LAC.96

![Figure 39. R&D expenditure (% of GDP)](image)

![Figure 40. Innovation index (0-100)](image)

Source: WDI and WEF. Other sources in Table 5.1. in the Appendix.

Corruption has been shown to be one of the main obstacles to innovation in Guatemala. Due to corruption, professionals in the public sector are hired not because of their skills and technical knowledge but based on their links to the government.97 Corruption also retards innovation in the private sector: a large majority of entrepreneurs in the informal sector identified high tax burden, regulation, and exposure to bribes as the most important reasons for not registering their businesses, which in turn dampens the growth of small businesses and the potential for entrepreneurship and innovation.98

There is a significant positive relationship between innovation and growth rate, and between R&D and innovation in Guatemala. Fixed effects panel data analysis shows that a one-percentage-point increase in the innovation index is associated with a 0.22 percent increase in the growth rate of Guatemala. And a one-percent increase in the R&D share of GDP is associated with a 43-percent increase in the innovation index of the country.99 Bringing all together, results of the statistical comparative and regression analyses suggest that investing in human capital, digital infrastructure and innovation is likely to promote Guatemala's productivity and long-term growth.
5.6. Financial Sector: Financial depth and bank competition

Guatemala’s financial sector is the shallowest compared to its peers. Guatemala has the lowest scores among its peers in all four financial depth indicators: bank assets, financial deposits, domestic credit to private sector, and insurance company assets (Figure 41). The number of ATMs has increased 16 percent since 2014, reaching 35 ATMs per 100,000 adults in 2018, which is higher than Honduras (24 ATMs per 100,000 adults in 2018) and at par with El Salvador, but is only around half of Costa Rica. Domestic credit to the private sector has been increasing steadily in Guatemala since 2011 (Figure 42), following the low and unstable credit rates in the 2000s, and is positively related to GDP growth.

Financial depth is positively associated with the growth rate of Guatemala. The econometric analysis indicates a strong positive relationship between GDP growth rate of a country and the GDP share of domestic credit to private sector, as well as its overall financial depth index. Specifically, a one percent increase in the GDP share of domestic credit is associated with a 0.13 percent increase in the growth rate of GDP. Existing research also provides evidence for a strong statistical association between financial depth, long-term economic growth and poverty reduction. This implies that low levels of domestic credit and financial depth, combined with the high interest rate (Figure 43), are likely to constrain investment and growth in Guatemala.

Guatemala appears to have moderate banking competition compared to its peers. Guatemala has a score of 57 out of 100 on its financial freedom index, above the average of upper middle-income countries and LAC and at the same level as its structural peers, but much lower than its aspirational

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**Figure 41. Financial depth indicators, 2000-2018**

![Financial depth indicators](image1)

**Figure 42. Domestic credit to private sector (% of GDP)**

![Domestic credit to private sector](image2)

**Figure 43. Financial depth vs. Interest rate, 2000-2018**

![Financial depth vs. Interest rate](image3)

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Source: Authors’ computation using data from World Bank Group.
peers and LAC high-income countries. The percent of bank assets held by the largest three banks, a measure of concentration and weak competition in the banking sector, shows that Guatemala has the lowest concentration in the banking sector among its peers, right after the G7 (Figure 44). However, the share of foreign bank assets is also among the lowest (after the G7), suggesting a lack of competitive pressure from external companies.

Figure 44. Indicators of bank competition, 2000–2018 average

Source: Authors’ computation using data from Heritage Foundation, Bank Scope.
6. Diversification and Exports

6.1. Why diversification matters to Guatemala

Global trends such as slower trade growth, the rising trade in services, the fragmentation of production, and automation pose challenges and opportunities for developing countries. Trade grew dramatically over the past 25 years, and capital flows followed a similar pattern. A wave of structural reforms in the 1990s geared toward trade liberalization and the ascent of China into global markets propelled the rise of global trade flows and a shift in the patterns of production worldwide. More recently, globalization has experienced important transformations. Global trade in goods has slowed and is expected to grow modestly in the future, as growth rates in emerging markets moderate and trade in services continues increasing in prominence. The increase in trade in intermediates and the separation of production into tasks has given rise to regional and GVCs. Value chains offer low- and middle-income countries a path to diversify production and new ways to export tasks, services, and other activities. However, low wages alone will become less of an advantage in low-skill-intensive industries, as machines replace certain tasks, and logistics and infrastructure aimed at increasing connectivity will become more important.

Since Guatemala is a small open economy, an export-oriented growth strategy is a good bet to create job opportunities, generate sustainable growth, and reduce the dependence of the country on remittances. In order to import the desired goods, countries need to export. Economic diversification is the shift of production and trade toward a more wide-ranging productive structure, pursued to increase productivity, generate jobs, and foster sustainable growth to reduce poverty. Trade plays a significant role in economic diversification. The successful East Asian countries’ diversification toward the manufacturing sector was accompanied by their integration into the global economy.

Economic diversification would help Guatemala create buffers against climate shocks and commodity cycles, and generate better-quality jobs linked to higher productivity growth. The literature provides various benefits of economic diversification (Appendix VI). In the case of Guatemala, diversification is critical to achieving sustainable growth for the following two reasons: first, it would help the country create buffers against climate shocks and commodity cycles. Koren and Tenreyro (2007) find that if a developing country with weak financial infrastructure specializes in sectors with high intrinsic volatility, it will tend to suffer greater aggregate volatility. The study states that if a country’s volatility is related to high exposure to a few high-risk sectors, strengthening financial institutions and diversifying the economy may be virtuous policy choices. Second, growth decompositions in Section 2 showed that past growth was driven by labor and capital accumulation rather than productivity improvements. This growth model is not sustainable in the long run, as the demographic dividend will vanish and its positive contribution to growth will dissipate. Since an export-oriented strategy implies higher competition in global markets, productivity growth is key for success. In addition to these reasons, the literature emphasizes that diversification brings an opportunity to create new and better-quality jobs (high productivity jobs) in the context of the structural transformation that diversification entails.

Guatemala is at an intermediate level of diversification, producing goods that many countries are also capable of producing. It is an empirical regularity that as countries develop, they tend to diversify their productive structures into more complex products. As a result, there should be a negative relationship between the number of products a country effectively exports (diversity) and the average ubiquity of its products. Figure 45 demonstrates this relationship and benchmarks Guatemala against its peers. The figure indicates that, on
average, OECD and aspirational countries have higher diversity and lower ubiquity than Guatemala. In other words, these countries tend to export a larger set of products, which are made by relatively few other countries. On the other hand, poor countries export fewer products (low diversity), which are produced and exported by most countries (high ubiquity). Guatemala is a country that exports many products as measured by diversity, but given that level, the country underperforms in terms of ubiquity.

**Figure 45. Diversification and ubiquity**

![Diversification and ubiquity graph](image)


### 6.2. Diversification of exports would help sustain growth and create jobs

Guatemala seems to be less open than other countries of the same level of development, suggesting that it may not be capitalizing on all potential gains from trade. Guatemala’s merchandise exports’ share in the GDP is significantly lower (14.6 percent) than the average for its aspirational peers (29.5 percent) and structural peers (26 percent). After widespread increases in the trade-to-GDP ratio between 2000 and 2012, Guatemala saw a drop in this ratio to the average of the 1990s, reflecting less integration into the world economy (Figure 46 and Figure 47).

**Figure 46. Merchandise exports as a percentage of GDP, average 2016–2018**

![Merchandise exports graph](image)

Source: World Bank staff using WDI.

Guatemala’s exports of merchandise are concentrated in food products and other manufactures, while exports of high value-added content remain limited. In 2000, food products accounted for 36.4 percent of merchandise exports, with bananas, sugar, and coffee representing 65 percent of all food exports. In terms of manufacturing, Guatemala specialized in low-complexity products, with articles of apparel and clothing representing
30.6 percent of the total exports in 2000.\textsuperscript{110} Two decades later, Guatemala has rebalanced its exports away from apparel and clothing mostly toward food products and manufactured materials. An important development over this period is that Guatemala is now more diversified, with 107 new products introduced since 2000, most of them coming from the food value chain.\textsuperscript{111} However, Guatemala is likely to remain dependent on agriculture exports, extractives, and primary products, given the wealth of its natural resources and the trends observed in recent years: between 30–35 percent of total exports are made up of a few low complexity products such as coffee, bananas, sugar, cardamom, and palm oil (Figure 48). Therefore, in order to generate more and better quality jobs, the country needs to further increase the value-added content of its exports, diversify the set of goods exported, as well as the set of destinations.

**Figure 48. Guatemala’s export composition 2007–2017**

Guatemala’s technological level puts the country between its aspirational and structural peers, indicating a growing dependence on unsophisticated products.\textsuperscript{112} As discussed by Hausmann et al. (2007), the composition of a country’s export bundle matters for an export-led growth strategy. In particular, several studies indicate that export composition, when biased toward activities that are more reliant on human capital and technology, can predict higher growth rates in the future.\textsuperscript{113} Figure 49 shows the composition of exports by level of sophistication and benchmarks it against Guatemala’s peers. Guatemala’s sophistication lies between aspirational and structural peers, with primary and resource-based products accounting for approximately 70 percent of merchandise exports. Interestingly, relative to both LAC countries and structural peers, the role of primary products in the export basket is smaller, which is offset by a higher proportion of low-tech exports. Over time, it seems that the complexity of the export basket does not trend toward sophistication (Figure 50). In fact, the share of high-tech and medium-tech exports in Guatemala is below all benchmarks except structural peers.

**Guatemala has increased the diversification of its exports’ destinations over time, but the United States remains the main export destination, followed by Central American countries.** Since 1990, the total number of Guatemala’s export destinations has followed an upward trend, similar to the experience of its structural
and aspirational peers. Historically, the United States has been the main importer of Guatemala’s products, although its importance has declined significantly in the last decade: its share in Guatemala’s total exports fell from around 44 percent in 2007 to 35 percent in 2017 (Figure 51). Another important destination is Central America, where El Salvador, Nicaragua, and Honduras accounted for around 25 percent of total exports in 2017. By comparison, OECD countries, excluding the United States and Mexico, received about 14.8 percent of Guatemala’s merchandise exports in 2017.

**Figure 49. Technological content of exports, 2017**

![Bar chart showing the technological content of exports by Lall Classification](chart)


Guatemala’s main exports are concentrated in a small number of destinations. Over 90 percent of Guatemala’s exports of bananas in 2017 were shipped to the United States, while most of the remainder was shipped to other OECD countries, in particular Italy (Figure 52). Other products also display a limited diversification of destinations: the United States and Japan together imported more than 50 percent of coffee exports; Saudi Arabia and the United Arab Emirates imported in total almost 60 percent of cardamom; and the Netherlands, Germany, and Mexico imported more than 80 percent of Guatemala’s palm oil. In most cases, Guatemala’s exports were largely concentrated in fewer than three main destinations, except for the case of sugar.

Since 2011, merchandise export growth was mostly driven by new products to old markets. Figure 53 portrays the decomposition of export growth since 1994. As it is standard in the literature, export growth can be decomposed into the intensive margin of trade, which refers to the exports of old products to old markets, and the extensive margin of trade, which refers to exports of old products to new markets, new products to old markets, or new products to new markets. Of the 55 percent increment in the volume of exports during the period 1994–2000, the intensive margin of trade (selling old products to old markets) accounts for two-thirds of Guatemala’s export growth, while exports of old products to new markets and new products to old markets together accounted for one-third. With the implementation of the CAFTA-DR free trade agreements in 2006, exports experienced a remarkable increase, which again was mainly driven by the intensive margin. For the period 2011–2017, the performance of exports showed a different behavior. While in previous years, the intensive margin contributed positively to the growth of exports, in this period it was a source of drag. The extensive margin made up for this drag through the growth of exports of new products to old markets and by old products to new markets.
Figure 51. Guatemala's main export destinations

<table>
<thead>
<tr>
<th>Year</th>
<th>Costa Rica</th>
<th>Honduras</th>
<th>Mexico</th>
<th>Nicaragua</th>
<th>OECD Excl. MEX and USA</th>
<th>Rest of the World</th>
<th>El Salvador</th>
<th>United States</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>43.7</td>
<td>11.1</td>
<td>16.2</td>
<td>10.4</td>
<td>6.8</td>
<td>3.6</td>
<td></td>
<td></td>
<td></td>
</tr>
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<td>2008</td>
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<td>11.1</td>
<td>17.9</td>
<td>11.2</td>
<td>6.7</td>
<td>4.0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
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<td>10.2</td>
<td>18.4</td>
<td>11.6</td>
<td>6.0</td>
<td>3.8</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2010</td>
<td>40.0</td>
<td>10.7</td>
<td>20.6</td>
<td>11.9</td>
<td>5.4</td>
<td>4.0</td>
<td></td>
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<tr>
<td>2011</td>
<td>42.8</td>
<td>10.1</td>
<td>17.4</td>
<td>13.3</td>
<td>5.1</td>
<td>7.3</td>
<td></td>
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<tr>
<td>2012</td>
<td>42.0</td>
<td>10.1</td>
<td>18.3</td>
<td>12.4</td>
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<td>7.6</td>
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<tr>
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<td>21.2</td>
<td>13.5</td>
<td>4.4</td>
<td>7.2</td>
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</tr>
<tr>
<td>2014</td>
<td>36.9</td>
<td>10.2</td>
<td>22.1</td>
<td>15.7</td>
<td>4.3</td>
<td>7.0</td>
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<tr>
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<td>2017</td>
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<td>5.1</td>
<td>8.8</td>
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</tbody>
</table>


Figure 52. Main destinations of each of Guatemala's main export products in 2017

Figure 53. Guatemala's export growth decomposition

Source: World bank staff using COMTRADE SITC2 classification.
**6.3. What are the paths for diversification?**

Diversification strategies can take many forms, from adding value to existing exports to developing new **products and services**. This section uses several standard trade analytical measures, like revealed comparative advantage (RCA), export quality, and product space analysis to indicate paths for diversification.

### 6.3.1. Export quality upgrading

**Building on comparative advantages, quality upgrading can boost productivity and support an export-oriented strategy.**

A common finding in the literature is that developed countries tend to export and consume higher-quality products than developing countries. Consequently, the ability of developing countries to transition from low-quality to high-quality products is seen as an important step towards export success and, ultimately, economic development. However, there is substantial heterogeneity in the amount of product differentiation, given that some products are characterized by a larger “quality ladder” than others. In general, the evidence suggests that the potential for quality upgrading is larger in manufacturing than in agriculture, but there are opportunities in the latter. Examples of agricultural products with a “long ladder” are wine and champagne, two products that have been used extensively in the trade literature, given the existence of objective measures of quality.

Guatemala has untapped opportunities to increase the quality of products in which the country already has a comparative advantage. The trade literature has relied on unit values (price per unit sold) to proxy quality. Figure 54 shows the worldwide maximum and minimum prices (normalized to the average price) for the main merchandise exported by Guatemala (blue line), together with the minimum, maximum, and average price charged by the country across all destinations (red line). As discussed, the scope for quality differentiation (blue line) varies across products. In particular, bananas and coffee present the best opportunities for upgrading, followed by sugar, palm oil, and cardamom. The prices charged by Guatemala (red line) in all cases are close to the worldwide minimum, indicating that Guatemala is exporting low-quality products and that there are opportunities to increase the quality of production.

**Figure 54. Quality upgrading opportunities for Guatemala**

Source: World Bank staff using data from CEPII. HS96 6-digit products.

### Strengthening safety and quality regulations and acquiring knowledge about existing differences and evolving trends in the types of products rich countries demand are key to quality upgrading.

The inability to comply with international quality standards has been identified as one of the main constraints to achieve quality upgrading. Therefore, strengthening safety and quality regulations to move toward international standards is a first step towards improving quality. The literature has also found that quality upgrading is associated with the adoption of a new set of business practices more oriented to export markets. These practices are radically different from those typically used in domestic markets, and involve adapting products to foreign demand. They entail upgrading production processes, complying with the strict requirements of foreign distributors, and seeking to establish long-term relationships with distributors to secure up-to-date information about foreign markets.

### Improving the institutional framework is key in order to upgrade the quality of products in the country.

Theoretical and empirical evidence suggest that the production of higher-quality varieties of a good typically requires the use of higher-quality inputs, which demand more customization and relationship-specific
investments. Accordingly, countries with a more developed institutional framework, including governance, rule of law, and property rights, and a strong contracting environment tend to have a comparative advantage in the production of high-quality products. Given that key development constraints in Guatemala are in part attributable to the poor quality of institutions and weak governance, improvements in these areas could open up opportunities to produce more differentiated products.

6.3.2. New export opportunities based on current capabilities

Recent research has shown that the process of economic diversification does not occur at random, rather there is path dependence based on product similarities. Changes in the RCA of nations are governed by the pattern of relatedness of products. In general, when countries diversify their export bundles, there is a propensity to move from products they are producing to products that are close, in terms of production knowledge and capabilities. Empirically, similarity is measured as the likelihood that a pair of products is co-exported. If two goods require roughly the same knowledge and capabilities, this should show up in a higher probability of a country having a comparative advantage in both products. Intuitively, if countries that tend to export wheat also export corn, then a country that starts exporting wheat should be able to diversify toward corn, given that the knowledge to produce them is similar. To graphically represent the connection of similarity across products (a network), the literature developed what is called the product space: two products connected by links based on their probability of being co-exported by countries.

Products in the product space differ in complexity and in the opportunities they present to diversify in the future. Figure 55 shows this network structure for Guatemala. The color of each node/product corresponds to a community, which is defined as a set of products that tend to be connected to each other more frequently because they require the same set of knowledge and capabilities to be produced. Products and their communities differ not only in complexity, but also in how connected they are: the higher the connectivity of a product, the higher the opportunities to diversify to other products. In general, more complex communities are more connected, and tend to be at the center of the product space. Based on this, the country’s opportunity gain (COG) is defined as the value of diversifying to a product that improves the connectivity of a country’s export basket.

Guatemala has made inroads into the larger, more complex, and more connected communities, such as garments, construction materials, chemicals, and machinery. The country has a significant presence in many products at the center of the product space, particularly, in agriculture and textiles such as sweaters, pullovers, and t-shirts (Figure 55). These sectors on average are more complex, and they open opportunities to increase connectivity for further diversification, and ultimately boost growth. However, key export products such as bananas and plantains, coffee, and palm oil are still close to the periphery of the product space and have low opportunity gains.

Countries can follow different approaches to diversify their economic structure, depending on their complexity and connectivity needs. Figure 56 maps each country in the space of the Economic Complexity Index (ECI) and Complexity Outlook Index (COI). Countries with low complexity typically have many products that are not at the core of the network and as a result do not have good connectivity. For these countries, the optimal approach would be to diversify into products that provide more opportunities for future diversification. Countries with low complexity but that are well-connected to more complex products might emphasize proximity of products. Countries with high complexity and good connectivity are in the best position to continue raising the average complexity and connectivity without much effort. Finally, countries with good complexity but lacking connectivity should weight equally proximity of the products to diversify and opportunity. Based on these considerations, a diversification strategy for Guatemala should take into account the trade-offs between distance, complexity, and opportunity value. To do this, two approaches are suggested: feasible diversification and complex diversification.
The feasible diversification strategy emphasizes feasibility rather than opportunities for further diversification. According to this strategy, a country should expand the set of goods it produces by focusing on products that have a higher level of sophistication, and for which the expertise required to produce them is closest
to the country’s present set of knowledge and production capabilities. This strategy stresses labor-intensive industries that will immediately create jobs. Specifically, the feasible index gives more weight to products that are close to the export basket of the country and gives less weight to the opportunity gain. This index weights closeness by 0.6, while the Product Complexity Index (PCI) and COG have a weight of 0.2 each. The government’s role is to provide incentives for attracting private investment, generate new production capabilities, and provide crucial public goods, such as infrastructure.

Of the 50 most feasible products for diversification, more than half belong to metals, stone, and glass; animal and vegetables; and textiles and footwear, but the products belonging to machinery, electrical and transportation score higher, on average, on the feasible diversification index. Table 2 shows the distribution across sectors of the 50 four-digit Harmonized system products scoring higher on the complex diversification index (see Appendix VII for details), as well as the mean of the index in each sector. In terms of the number of products, metals, stone, and glass present the highest number of complex diversification opportunities (12), followed by animal and vegetables (11); and textiles and footwear (6). However, according to the mean value of the index, the machinery, electrical and transportation sector seems to offer the most feasible diversification opportunities, followed by foodstuffs.

Combining the information on the top 50 products in each sector, and their average feasibility index value, three sectors are revealed as providing better strategic opportunities: i) metals, stone, and glass; ii) textiles and footwear; and iii) animal and vegetables. The feasibility analysis identified opportunities within metals, stone, and glass in plastics and articles thereof (such as bails and similar articles of iron or steel, and ferrous waste and scrap). Within the textiles and footwear sector, the opportunities are placed in articles of apparel and clothing access, not knitted/crocheted (such as women’s shirts or leather footwear. Finally, in the animal and vegetables sector, diversification is more likely in dairy products-birds’ eggs, natural honey and edible products (such as fish fillets, fowl, etc.)

The complex diversification strategy emphasizes the development of more complex products that provide more opportunities for further diversification (larger strategic value). The products identified by this strategy may require production capabilities that are not close to those in the country. This index weights COG by 0.6, while PCI and closeness have a weight of 0.2 each. The sectors identified in this strategy are important to boost economic growth, improve the diversification outlook, and create jobs of higher quality.

Among the 50 products with the largest strategic diversification value, close to 80 percent of the products belong to three sectors: machinery, electrical and transportation; metals, stone, and glass; and chemical and allied industries. Table 3 shows the distribution across sectors of the 50 four-digit HS products scoring higher on the complex diversification index (see Appendix VII for details), as well as the mean of the index in each sector. In terms of the number of products, the machinery, electrical and transportation sector presents the highest number of complex diversification opportunities (21), followed by metals, stone, and glass (12) and chemical and allied industries (7). According to the mean value of the index in the sector, the machinery, electrical and transportation sector seems to offer the best strategic diversification opportunities with the largest strategic value, while textiles and footwear offers the least strategic among these sectors.
After combining the information on the number of top 50 products in each sector and their average strategic value, three sectors emerge as those providing the better strategic opportunities: i) machinery, electrical and transportation; ii) miscellaneous; and iii) chemical and allied industries. The complexity analysis identified opportunities within machinery, electrical and transportation mainly in the subsector “boilers, nuclear reactors, and machinery and mechanics appliances” (such as machines for assembling electric lamps, machining centers for working metal; compression-ignition internal combustion piston engines, other than for metals or glass; pumps for liquids, etc.). Within the miscellaneous sector, the opportunities are placed in the subsector “optical, photo, cine, checking, precision, industries” (such as X-ray machines, machines for testing the mechanical properties of materials, measuring instruments, etc.). Finally, in the chemical and allied industries sector, diversification is more likely in the subsector “organic chemicals” (such as phenols, phenol-alcohols and esters of other inorganic acids of nonmetals).

Combining the two approaches, three sectors provide a good balance between feasibility and strategic opportunities for diversification: i) metals, stone, and glass; ii) textiles and footwear; and iii) machinery, electrical, and transportation. Although not all the sectors offering higher feasible diversification opportunities present better strategic diversification opportunities, by combining the results of these analyses three sectors can be identified as those providing the better overall diversification opportunities. The textiles and footwear and animal and vegetables sectors provide the best feasible diversification opportunities. On the other hand, the machinery, electrical, transportation sector offers the best complex diversification opportunities, even though the required capabilities are far from current ones and therefore expanding in that sector will be challenging.

The capabilities to achieve some of these products within the feasible and complex approach require government involvement to build capacity and incubate new industries. To venture into the production of some of these products, it is not enough to just provide more education or improve infrastructure. The process of diversification requires the emergence of industries that in most cases are not currently available. In fact, these industries may require inputs or know-how that is not currently within the country. Given that some of these industries do not exist in the country, there is little incentive for workers to acquire the necessary skills to operate in these industries. The government could ease this problem by providing incentives to the private sector and creating an enabling environment to nurture the new sectors.

For products close to current capabilities, sectoral dialogue could be a solution, but for products far from current capabilities there must be a new and specialized approach. In particular, dialogue could lead to the identification of the necessary missing public goods and ways to provide them. However, for products far from existing capabilities, specialized institutions such as a public venture could be set up to fund new business models and initiatives that could trigger significant future entries into the market. The fund would give the government access to those ideas, analyze the obstacles they face, and inform public policy, so that the requisite public inputs could be provided if deemed reasonable. Some successful examples of these type of institutions are the Fundación Chile and the Industrial Development Corporation of South Africa.

New technologies and changing globalization patterns provide challenges and opportunities for export-led manufacturing strategies. In order to take full advantage of these opportunities and to mitigate some of the costs associated with these changes, countries need to embrace three areas: competitiveness, capabilities,
and connectedness. \textit{Competitiveness} addresses the shift from low wages as the main incentive to produce in developing countries to broader considerations of the business environment in determining low unit labor costs. \textit{Capabilities} addresses the need for workers and firms to strengthen their ability to adopt and use new technologies. In addition, it requires the necessary infrastructure and regulations to support the spread of new technologies. Finally, \textit{connectedness} relates to the importance of access to the inputs and output market. Key elements to progress in this area are improvements in logistics, reductions in tariffs and non-tariff barriers, and the reduction of restrictions in services, particularly trade restrictions.\textsuperscript{134}

\textbf{Guatemala needs to strengthen its capabilities and increase its competitiveness.} Countries can be mapped in each of the three areas to identify where they need to improve. Figure 57 illustrates such mapping. Competitiveness is constructed by combining different indicators such as ease of doing business and the rule of law. Capabilities to support technology diffusion and innovation combine dimensions such as information and communications technology (ICT) use and tertiary school enrollment. Finally, connectedness to markets combines dimensions such as logistics performance, restrictions on trade in manufactured goods, and restrictions on trade in professional services. Based on these measures, Guatemala is considered to have low levels of capabilities to adopt new technologies and low competitiveness. Consequently, improving in these areas could have large payoffs. For example, programs that support domestic firms—especially smaller ones—to adopt international quality standards and update their management skills would help them access funding, improve their operations, and improve competitiveness. On the other hand, enhancing connectivity within Guatemala and between countries would promote Guatemala’s competitiveness.

\textit{Figure 57. Country distribution in the space of competitiveness, capabilities, and connectedness}

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{figure57.png}
\caption{Country distribution in the space of competitiveness, capabilities, and connectedness}
\end{figure}


6.3.3. \textit{Services provide opportunities to boost trade and domestic linkages}

Exports of services from Guatemala remain an area of great potential for job creation and growth. Two characteristics that made manufacturing the preferred sector for growth in the past were the ability to address competitive pressures and achieve improvements in efficiency, and the possibility of expanding demand by exporting to global markets. These characteristics were not relevant to services. Today, the old view of services being non-tradable, with low scale and low productivity, is being challenged by the disruption of ICT. The evolution of the internet, digitalization, and electronic storage are enabling a rapid increase in cross-border trade
in services, which is an opportunity for developing countries to sustain services-led growth. The increasing prevalence of productivity-enhancing characteristics in services, including in low- and middle-income countries, expands the range of activities that will likely have positive spillovers for development.135

However, Guatemala’s exports of services are far below what is expected, opening the door for improvements and growth. The performance of service exports as a share of GDP is below the expected level, given the country’s per capita income level (Figure 58). In the regional context, Guatemala is also far below all Central American neighbors, with Panama and Costa Rica being the stars. Ghani and Kharas (2010) show that there is a linear positive relationship between the growth of services and the growth of GDP, indicating that there is a correlation between high growth in services and high growth in GDP. Figure 66 confirms this correlation: While aspirational peers and OECD countries have a large export of services as a share of GDP, low-income countries minimally participate in trade in services.

Guatemala’s exports of services are concentrated in traditional services, but modern services are rapidly becoming more relevant for Guatemala. Today, developments in ICT have changed the nature, productivity, and tradability of services. However, Guatemala’s services sector is mostly concentrated in traditional services such as transportation, travel, and construction. Developed countries tend to export more complex services, often called “modern or nontraditional services”. Among these services, economists typically include ICT, financial and insurance services, health, and other business services, which are mostly professional services such as consulting, architecture, and so on. These services in general are more intensive in high-skilled labor, and this implies that they are important to generate high-wage jobs that allow the absorption of highly-skilled workers. Regulatory barriers continue to slow down trade in these services, although where deregulation has occurred, it has coincided with a marked increase in FDI inflows in developing and developed countries. In Guatemala, the share of modern services exports is growing, from 20 percent of service exports in 2000 to 27 percent in 2018.

The “other business services” element of modern services is showing signs of an important dynamism, and continuing support is necessary. Other business services have exhibited impressive growth but need
6. DIVERSIFICATION AND EXPORTS

continued support, since the sector requires high-skilled workers. Exports of other business services have multiplied by a factor of three between 2010 and 2018, contributing the most to total modern services export growth during this period. Moreover, they now represent more than 16 percent of total service exports, and the sector is rapidly gaining competitiveness in the global economy, as measured by the RCA index.

Guatemala has comparative advantages in tourism and sea transport, which are also growing components of the modern services sector, and worthy of continued support. Between 2010 and 2018, tourism exports increased by 13 percent, and sea transport exports increased by 18 percent. Tourism is an important sector to support, given the potential to create jobs for low-skilled workers in related activities such as hotels, restaurants, and entertainment. On the flip side, these types of sectors are less likely to provide much by way of productivity gains. Therefore, a given service subsector is unlikely to simultaneously provide opportunities for productivity growth and job creation for unskilled people.

The country possesses comparative advantage in ICT, but exports in that industry have been declining since 2015. Between 2010 and 2015, the ICT industry made important progress as a genuine source of exports, increasing the value of exports, the participation in services, and its RCA. In particular, ICT participation increased from 12 percent of services exports in 2010 to 18 percent in 2015, an increase of 95 percent in the value of exports in that period of time. Since then, exports of ICT in Guatemala have declined, and today they stand at similar levels as in 2010. However, the country still retains comparative advantage in the sector, and continuing support will be necessary to recover lost ground. Strengthening the ICT sector is important not only as a source of growth, but also as a critical input for trade integration, private sector development, and public service delivery.

Closing the gaps in institutions and education could favor the development of high-skill services. Better institutions and higher levels of education are complementary sources of comparative advantage in the more complex goods and services. The value-added content or complexity of services is not homogenous. For instance, professional services are more complex than hotel services. In general, the production of more complex processes implies a larger number of tasks. An economic environment with a well-defined rule of law is associated with comparative advantages in complex services, and as a result with higher exports of complex services. This is because complex services are dependent on good institutions that enforce contracts: better institutions increase the probability that contracts are enforced, and therefore complex services with multiple tasks have a higher probability of being delivered. Similarly, complex services require high-skilled workers, and therefore the quality of the pool of workers is a key enabler of services trade.

Increased investments in R&D could also spur domestic innovation which could help domestic firms plug into GVCs. Over 2017-19, Guatemala experienced a decrease in R&D expenditures as a percentage of GDP (0.04 to 0.02) and industry-university collaboration in R&D (3.4 to 3.2) (WEF, 2019). Moreover, in the same period, the number of companies embracing disruptive ideas in Guatemala did not change. Government needs to increase investments in R&D and introduce capital intensive inputs to increase value addition. Taking the example of Denmark, the country became a top exporter in food products simply by investing heavily in R&D along the value chain e.g., from innovative methods of food production to ICT communication strategies for advertising. Guatemala should leverage its positive performance in the trade of computer and communication services (at 28.5 percent, exports were greater than imports at 15.8 percent of commercial services exports in 2018) by increasingly utilizing its homegrown talents in different industries.
7. Conclusion

In recent years, Guatemala has made substantial macroeconomic progress to stabilize its economy, but despite these achievements, growth has been modest. Historically low budget deficits and public debt levels have made the country more resilient to external shocks and have helped it achieve more stable macroeconomic conditions. In this context, Guatemala has exhibited sustained, albeit modest, economic growth since the late 1990s. However, this progress has not been able to offset continuous declines in real GDP per capita since 1960, suggesting that further action must be taken to promote growth. Inequality is still very large in several important areas, including education, healthcare, and access to basic services, such as electricity, water, and sanitation.

Growth has been mainly driven by a factor accumulation, primarily labor accumulation, but has been hindered by inadequate infrastructure and human capital, among other constraints. The analysis shows that Guatemala’s TFP growth has been disappointing, suggesting that the country may have considerable room for improvement in this area. Moreover, Guatemala’s structural transformation did not always reallocate labor to higher productivity sectors. The analysis identifies several areas that may be hindering TFP growth in Guatemala, such as the high levels of corruption, gaps in human capital and infrastructure, limited innovation, and crime and violence. Poor and inadequate physical infrastructure has been identified as one of the major constraints to growth and development in Guatemala. A comprehensive growth agenda in Guatemala needs to strengthen its institutions; incentivize investment in human capital, innovation, and infrastructure; and promote the diversification of production and exports by adding high value-added products to the mix.

Guatemala can leverage its strategic location, cultural diversity, and promising diversification opportunities in sectors in which the country already has a comparative advantage. Duty-free access under CAFTA-DR makes prices from other regions uncompetitive, but the United States is increasingly importing from Vietnam, as it is still affordable. Competition would have intensified had the United States signed the Comprehensive and Progressive Agreement for Trans-Pacific Partnership, which includes Vietnam. While this is not yet the case, Guatemala would do well to prepare for external competition, take advantage of its geographic position, produce better quality goods, and supply according to real-time demand.

Accordingly, an export-oriented growth strategy based on new products, including services, could help Guatemala create better job opportunities, generate sustainable growth, reduce the dependence on remittances, and limit exposure to the United States. Such a strategy implies higher competition in the global markets, so productivity growth is key for success. Promoting exports of services could also be an important part of this strategy, as services exports are currently far below their potential. Closing institutional gaps and improving education could favor the development of high-skilled services, given that better institutions and higher levels of education are complementary sources of comparative advantage in services.
Outdated data in poverty and other indicators: the last household survey (ENCOVI) was collected in 2014, the last demographic and health survey (ENSMI) was collected in 2014/5, and the last household budget survey (ENIGIFAM) was collected in 2009/10.

Aspirational peers of Guatemala are Albania, Chile, Jordan, Latvia, Lithuania, Panama and Peru. See Table 1.3. in the Appendix for the methodology used to identify the structural and aspirational peers of Guatemala.

The five determinants are innovation, education, market efficiency, infrastructure and institutions that are linked to policy choices. This model is an Excel-based tool that could be used by policymakers for more detailed counterfactuals if desired.

WDI 2019. GDP is in 2010 constant U.S. dollars. Honduras had the second largest population, with 9.6 million, and Costa Rica the second largest real GDP, with $56.3 billion.

Guatemala's structural peers are El Salvador, Bolivia, Honduras, Nicaragua, Paraguay, and Senegal and aspirational peers are Albania, Chile, Jordan, Latvia, Lithuania, Panama, and Peru. See appendix I for the methodology of determining the structural and aspirational peers.

All figures are computed using data from WDI 2019. Volatility is measured as the standard deviation of the growth rate of real per capita output.

The average gross debt of the Guatemalan government averaged 14%, 20.7% and 24.3% during the 1990s, 2000s, and 2010s, respectively, and was 24.5% in 2018. Similarly, the general government budget deficit is the lowest among all comparator economies in 2010–2018 (2% of GDP), despite a gradual increase since the 1990s. Data is from the Federal Reserve Bank of St. Louis and World Economic Outlook (WDI).


See Keen (2003) for a detailed analysis of the Guatemalan Civil War.

Chamarbagwala and Morán (2011). Commission for Historical Clarification 1999. During the Civil War, around 200.000 people were killed or disappeared, and 500.000 were displaced. More than 90 percent of the total human rights violations were committed by the government or allied groups, mainly by the state to civilians, and 83% of the identified victims of these violations were Mayan.

Chamarbagwala and Morán (2011).

Growth during the 2008-2009 financial crisis was positive, but when population growth is confirmed there is a contraction in per capita GDP.

WDI.

United Nations Conference on Trade and Development (UNCTAD).


Economic Commission for Latin America and the Caribbean (CEPAL) 2002; World Bank 2002.

CEPAL 2002, and World Bank 2002. In only one year, from 1999 to 2000, revenue from coffee sales decreased by 44 percent in Central America, including in Guatemala, leading to high levels of unemployment and poverty in rural areas.


UNDP 2009; FDI share of GDP in 2000, 2001, and 2002 were -4.09%, -5.01%, and -4.89% of GDP, respectively, before reverting to positive (0.09%) in 2003 (WDI).

WDI 2019. In 2004, official development assistance was 0.96 percent of Guatemala’s GDP, which stayed around 1 percent until 2014, before settling around 0.5 percent from then onwards.

Structural peers of Guatemala are Bolivia, El Salvador, Honduras, Nicaragua, Paraguay and Senegal. See Table 1.3. in the Appendix for the methodology used to identify the structural and aspirational peers of Guatemala.


See Appendix II for a discussion on the concept of productivity and how it is measured.

See Solov (1956) and Solow (1957).

Sanchez et al (2015). The 2015 systematic country diagnostic pointed out that the Guatemala was in the early stages of a demographic transition. Guatemala collected its most recent Population census in 2018, after more than 15 years since the last Census (INE, 2002). The recently published Census data confirms that a demographic dividend in the country is already in progress, which translates into a large population entering the labor market, despite the fact that migration flows out of Guatemala are important.

This largely reflects our calculation of TFP as a residual (in line with standard growth accounting methodologies) such that the recent period of growth slowdown and recession appears caused by a negative contribution of productivity, when in fact it was driven by other unobserved factors which are bundled into the TFP residual, such as an increase in spare capacity and inventories.

In general, TFP is proportional to labor productivity. As a result, low levels of labor productivity are related to low levels of TFP. See appendix II for a discussion of different measures of productivity commonly used in the literature.

Here, it is assumed that the public capital stock generates social benefits in the future. In this sense, investment with low social returns shouldn’t be considered. To see more details of the model, see Appendix III.

The Long-Term Growth Model (LTGM) is an Excel-based tool building on the celebrated Solow-Swan growth model, but adapted to include growth and poverty reduction drivers. See Appendix III for more details on the model and the methodology to perform the simulations. All the quantitative results presented in this section are pre-Covid estimates on long-term output.

One potential concern related to the increase in public infrastructure is corruption. From a policy perspective, a reduction in corruption today will increase the growth dividend from public investment, suggesting the need to “invest in investing” – building the institutional capacity in public investment management systems to reduce corruption. These improvements in institutional capacity will have a greater effect on growth the higher the rate of public investment (Devadas and Pennings 2018 WPS8604). A reduction in corruption can be modelled in the LTGM-Public Capital in principle but is hard to calibrate in practice. More technically, LTGM-Public Capital, the level of corruption in public investment projects doesn’t affect growth so long as it is constant (has always been the same in the past). This reason is that past corruption reduces the current effective public
capital to output ratio and increases the marginal product of public capital. In other words, high levels of past corruption mean that the current level of the public capital stock is overstated, and the country is in even greater need of public capital. This almost exactly offsets the reduced effectiveness of new public investment due to current corruption (the offset is exact if the production function is Cobb-Douglas). This surprising result, which is very robust, comes from Berg et al (2015).

34 The barriers are typically model as a wedge between that breaks the identity between occupational wages and marginal products. These barriers capture the many taste-based and statistical discrimination. Barriers in human capital accumulation arise as higher relative education costs and enrollment of factors such as favorable treatment received by men from parents and teachers, formal and informal restrictions on women entering schools and training programs. In addition to the two barriers, the occupational choices across men and women can deviate due to differences in preferences and social norms. See Costa (2000) and Blau et al. (2013).

35 Estimates are based on simulations using the dynamic GTAP model (GDyn) – a multi-sector, multi-region, multi-factor CGE model. The model is ideal for measuring the impact of labor market policies as it takes into consideration general equilibrium linkages such as interactions between consumers, producers, and governments; inter- and intra-industry links; interactions between domestic and foreign markets; and resource constraints. Results capture the long-run impacts of policy changes as results are reported relative to a baseline scenario by 2030.

36 It is implicitly assumed that women entering the labor force had no previous economic value added. E.g. taking care of children or their employment in informal activities is only captured to the extent that these are in the official labor force statistics. Wages for women are assumed to be the same as those of men.


38 Indicators used to conduct the indexes for each of these areas are listed Appendix III and the data used to compute these indicators are available upon request.

39 Kim, Loayza, and Meza-Cuadra (2016); Kim and Loayza (2019).


41 Buera and Shin (2013).

42 Structural transformation typically holds for developed and developing countries. See the flagship “Economic transformation and Future of Work in LAC” (2019). Also, see Kutznets (1975) and Herrendorf, Rogerson, and Valentinyi (2014).

43 See Lewis (1954), Fei and Ranis (1964) and Chenery (1979).


45 Rodrik (2013).

46 See Buera and Kaboski (2009) and Restuccia et al. (2008).


48 The sectors that diverged the most are utilities and transportation, storage, and communications.


51 A. Bars show the simple averages of DGE-based estimates for corresponding country groups, with diamonds showing the simple averages of MIM-IC-based estimates for corresponding country groups.

52 B. Bars show the simple averages of survey-based estimates on self-employment for corresponding country groups, with diamonds showing the simple averages of model-based estimates on self-employment (ILO) and triangles showing the simple averages of informal employment (ILO).

53 See Table 5.1 in the Appendix for the methodology used to compute indexes and the full list of indicators used to compute the indexes for each 18 area.

54 Fund for Peace 2018.

55 Males accounted for 85 percent of homicides in 2018, and young men aged between 25 and 29 are at highest risk of homicide.

56 Chioda (2017).


60 This result is obtained from the fixed effects regression analysis of real GDP growth in terms of security threat index and its interaction term with country dummies, after controlling for investment, labor, human capital and year dummies and correcting for heteroskedasticity and cross-country correlation in the error terms. Data cover 1794 observations from 156 countries during 2000-2018. Results are not reported but available upon request.


63 Transparency International 2019, Grand Corruption and the SDGs.

64 This result is obtained from the fixed effects regression analysis of real GDP growth with respect to freedom from corruption index and its interaction term with country dummies, after controlling for investment, labor, human capital and year dummies and correcting for heteroskedasticity and cross-country correlation in the error terms. Data cover 2772 observations from 161 countries during 2000-2018. The relationship between real GDP per capita (log) and freedom from corruption index is also positive and significant. Results are not reported but available upon request.


68 BTI (2018).


72 See WDI data.


The results are obtained from the fixed effects regression analysis of real GDP growth with respect to infrastructure indicators and their interaction terms with country dummies after controlling for GDP per capita, investment, labor, human capital and year dummies. Cross sectional regression results are obtained from the regression of GDP per capita (log) with respect to infrastructure indicators, after controlling for investment, labor, human capital and regional variations. Results are not reported here but available upon request.

Only two variables had an unexpected sign. (i) Brain drain indicator: though the coefficient of this indicator was negative for Guatemala, it was not significantly different from that of its structural peers, which had a coefficient with a positive sign. (ii) Health spending per capita had a positive and significant. Human Development Indicator was not significant.

Skilled labor is defined based on the ILO’s International Standard Classification of Occupations and includes occupations such as managers, professionals, technicians, and associate professionals. Unskilled labor includes clerical support workers, service and sales workers, craft and related trades workers, plant and machine operators, assemblers and elementary occupations, and skilled agricultural, forestry, and fishery workers.

The results are obtained from the fixed effects regression analysis of real GDP growth with respect to innovation indicators and their interaction terms with country dummies after controlling for GDP per capita, investment, labor, human capital and year dummies. Cross sectional regression results are obtained from the regression of GDP per capita (log) with respect to innovation indicators, after controlling for investment, labor, human capital and regional variations. Results are not reported here but available upon request.

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As it is standard in a large part of the literature, we will proxy quality with unit values. See Schott (2004), Hummels and Klenow (2005), and Khaldewal (2010).

This proxy for quality is standard in the trade literature. See Schott (2004), Hummels and Klenow (2005), Khaldewal (2010).

Here we are using a weighted average, where the weights are given by the export value for a given unit price relative to the value of exports of a HS96 product.

Note: To reduce the influence of measurement error and outliers, we “winsorized” the unit prices for each HS6 product by keeping the values between the 3rd and 97th percentile.

OECD/WTO (2019).


See Levchenko (2007), Hallak and Schott (2010), and Essaji and Fujiwara (2012).


Technically, the product space is a network that formalizes the idea of relatedness between products traded in the global economy.

The COI is a measure of how many complex products are near a country’s current set of capabilities. It captures the ease of diversification for a country, where a high COI reflects an abundance of nearby complex products with similar capabilities to the ones the country is using.

For more details on the construction of these indexes, please refer to Appendix VII.

These sectors were selected based on an index that combines the number of products and mean value of the feasible index (normalized series). More details on the construction of these indexes, please refer to appendix VII.

These sectors were selected based on an index that combines the number of products and mean value of the complexity index (normalized series). More details on the construction of these indexes, please refer to appendix VII.


Hallward-Driemeier and Nayyar (2017).

See Ghani and Kharas (2010).

See Anand et al. (2012) and Duarte and Restuccia (2019).


For example, other business services include professional services, consulting services, technical and trade related, and research and development services.

Competitiveness is measured using the revealed comparative advantage (RCA) index developed by Balassa in 1965. Country A has RCA


Costinot (2009).
References


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