UNLEASHING CENTRAL AMERICA’S GROWTH POTENTIAL

Cross-Cutting Themes: Strengthening Productive Links and Managing Volatility

Edited by Hulya Ulku and Gabriel Zaourak
# Contents

List of Acronyms and Abbreviations 1  
Acknowledgments 3  
Executive Summary 5  

## 1. Capturing Efficiency Gains from Intra-Regional Trade 13  
   1.1. Background 13  
   1.2. Methodology 14  
   1.3. Results 15  
      1.3.1. The impact of improvements in trade facilitation 15  
   1.4. Conclusion and policy recommendations 19  

## 2. Exploiting the Growth Potential of GVCs 21  
   2.1. Introduction 21  
   2.2. Measuring Export Value Added 22  
   2.3. Participation in Global Value Chains 26  
   2.4. The role of FDI and Labor Mobility in GVCs 29  
   2.5. Positioning in GVCs 30  
   2.6. Conclusion and policy recommendations 32  

## 3. Better Utilizing the Demographic Bonus in the Informal Economy 35  
   3.1. Introduction 35  
   3.2. Measuring the informal economy 36  
   3.3. Informality in Central America 36  
   3.4. Empirical results 41  
   3.5. Relevant international and Central American experiences 44  
      3.5.1. Fiscal policies 44  
      3.5.2. Business climate and governance measures 45  
      3.5.3. Measures on boosting long-term growth and improving productivity 46  
   3.6. Conclusion 47
## CONTENTS

### 4. Managing Volatility from Trade and Financial Flows 49

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.1. Introduction</td>
<td>49</td>
</tr>
<tr>
<td>4.2. Methodology</td>
<td>51</td>
</tr>
<tr>
<td>4.3. Results</td>
<td>54</td>
</tr>
<tr>
<td>4.4. Conclusion</td>
<td>55</td>
</tr>
</tbody>
</table>

### 5. Enhancing the Role of Remittances in Consumption Smoothing and Productive Investment 59

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.1. Introduction</td>
<td>59</td>
</tr>
<tr>
<td>5.2. Relationship between remittances and productivity in EMDEs and LAC</td>
<td>62</td>
</tr>
<tr>
<td>5.3. Relationship between remittances and productivity in Central America</td>
<td>65</td>
</tr>
<tr>
<td>5.4. Conclusion</td>
<td>69</td>
</tr>
</tbody>
</table>

### 6. Conclusion 73

### 7. Annexes 75

<table>
<thead>
<tr>
<th>Annex</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Key economic indicators</td>
<td>77</td>
</tr>
<tr>
<td>2. Country-level analysis on the impact of uncertainty</td>
<td>79</td>
</tr>
<tr>
<td>2.1. Costa Rica</td>
<td>79</td>
</tr>
<tr>
<td>2.2. El Salvador</td>
<td>80</td>
</tr>
<tr>
<td>2.3. Guatemala</td>
<td>81</td>
</tr>
<tr>
<td>2.4. Honduras</td>
<td>82</td>
</tr>
<tr>
<td>2.5. Nicaragua</td>
<td>83</td>
</tr>
<tr>
<td>2.6. Panama</td>
<td>84</td>
</tr>
<tr>
<td>3. Country-level Analysis on Remittances</td>
<td>86</td>
</tr>
</tbody>
</table>

### Endnotes 90

### References 93
List of Acronyms and Abbreviations

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>AEs</td>
<td>Advanced Economies</td>
</tr>
<tr>
<td>BF</td>
<td>Business Freedom</td>
</tr>
<tr>
<td>CA</td>
<td>Central America</td>
</tr>
<tr>
<td>CABEI</td>
<td>Central American Bank for Integration</td>
</tr>
<tr>
<td>CAFTA-DR</td>
<td>Central America Free Trade Agreement (DR and US)</td>
</tr>
<tr>
<td>CBOE</td>
<td>Chicago Board Options Exchange</td>
</tr>
<tr>
<td>CGE</td>
<td>Computable General Equilibrium model</td>
</tr>
<tr>
<td>CIF</td>
<td>Cost Insurance and Freight</td>
</tr>
<tr>
<td>CPI</td>
<td>Corruption Perception Index</td>
</tr>
<tr>
<td>CRI</td>
<td>Costa Rica</td>
</tr>
<tr>
<td>DB</td>
<td>Doing Business</td>
</tr>
<tr>
<td>DGE</td>
<td>Dynamic General Equilibrium</td>
</tr>
<tr>
<td>DR</td>
<td>Dominican Republic</td>
</tr>
<tr>
<td>DVA</td>
<td>Domestic Value Added</td>
</tr>
<tr>
<td>EAI</td>
<td>Economic Activity Indicator</td>
</tr>
<tr>
<td>ECLAC</td>
<td>Economic Commission for LAC</td>
</tr>
<tr>
<td>EF</td>
<td>Economic Freedom</td>
</tr>
<tr>
<td>EMDEs</td>
<td>Emerging Markets and Developing Economies</td>
</tr>
<tr>
<td>EPU</td>
<td>Economic Policy Uncertainty</td>
</tr>
<tr>
<td>FDI</td>
<td>Foreign Direct Investment</td>
</tr>
<tr>
<td>FoB</td>
<td>Free on Board</td>
</tr>
<tr>
<td>FVA</td>
<td>Foreign Value Added</td>
</tr>
<tr>
<td>GDP</td>
<td>Gross Domestic Product</td>
</tr>
<tr>
<td>GDyn</td>
<td>Dynamic GTAP</td>
</tr>
<tr>
<td>GNI</td>
<td>Gross National Income</td>
</tr>
<tr>
<td>GTM</td>
<td>Guatemala</td>
</tr>
<tr>
<td>GVC</td>
<td>Global Value Chain</td>
</tr>
<tr>
<td>HND</td>
<td>Honduras</td>
</tr>
<tr>
<td>IADB</td>
<td>Inter-American Development Bank</td>
</tr>
<tr>
<td>ICSE</td>
<td>International Classification of Status in Employment</td>
</tr>
<tr>
<td>Acronym</td>
<td>Description</td>
</tr>
<tr>
<td>---------</td>
<td>-------------</td>
</tr>
<tr>
<td>ICT</td>
<td>Information and Communications Technology</td>
</tr>
<tr>
<td>ILO</td>
<td>International Labor Organization</td>
</tr>
<tr>
<td>IMF</td>
<td>International Monetary Fund</td>
</tr>
<tr>
<td>IOM</td>
<td>International Organization for Migration</td>
</tr>
<tr>
<td>IRF</td>
<td>Impulse-response Functions</td>
</tr>
<tr>
<td>LAC</td>
<td>Latin America and the Caribbean</td>
</tr>
<tr>
<td>MIMIC</td>
<td>Multiple Indicators Multiple Causes</td>
</tr>
<tr>
<td>NIC</td>
<td>Nicaragua</td>
</tr>
<tr>
<td>NTB</td>
<td>Non-tariff Barriers</td>
</tr>
<tr>
<td>ODA</td>
<td>Official Development Assistance</td>
</tr>
<tr>
<td>OECD</td>
<td>Organization for Economic Cooperation and Development</td>
</tr>
<tr>
<td>PAN</td>
<td>Panama</td>
</tr>
<tr>
<td>PPP</td>
<td>Purchasing Power Parity</td>
</tr>
<tr>
<td>SEMP</td>
<td>Self-employment Data</td>
</tr>
<tr>
<td>SICA</td>
<td>Central American Integration System</td>
</tr>
<tr>
<td>SLV</td>
<td>El Salvador</td>
</tr>
<tr>
<td>SME</td>
<td>Small, Medium Enterprises</td>
</tr>
<tr>
<td>TFA</td>
<td>Trade Facilitation Agreement</td>
</tr>
<tr>
<td>TPS</td>
<td>Temporary Protected Status</td>
</tr>
<tr>
<td>U.S.</td>
<td>United States of America</td>
</tr>
<tr>
<td>UN</td>
<td>United Nations</td>
</tr>
<tr>
<td>UNECLAC</td>
<td>United Nations Economic Commission for LAC</td>
</tr>
<tr>
<td>UNESCAP</td>
<td>United Nations Economic and Social Commission for Asia and the Pacific</td>
</tr>
<tr>
<td>VAR</td>
<td>Vector Auto Regression/Regressive</td>
</tr>
<tr>
<td>VAT</td>
<td>Value-added Taxation</td>
</tr>
<tr>
<td>VIX</td>
<td>Volatility Index</td>
</tr>
<tr>
<td>WB</td>
<td>World Bank</td>
</tr>
<tr>
<td>WDI</td>
<td>World Development Indicators</td>
</tr>
<tr>
<td>WEF</td>
<td>World Economic Forum</td>
</tr>
<tr>
<td>WGI</td>
<td>Worldwide Governance Indicators</td>
</tr>
<tr>
<td>WoRLD</td>
<td>World Revenue Longitudinal Data</td>
</tr>
<tr>
<td>WTO</td>
<td>World Trade Organization</td>
</tr>
</tbody>
</table>
Acknowledgments

The “Unleashing Central America’s Growth Potential” analytical body of work consists of a synthesis report, six country specific reports, and a report on selected cross-cutting themes. The reports were co-led by Hulya Ulku (Senior Economist, ELCDR) and Gabriel Zaourak (Economist, ELCMU) under the guidance of Jorge Araujo (Practice Manager, ELCMU), Pedro Rodriguez (Program Leader, ELCMU), Seynabou Sakho (former Country Director, LCC2C), Michel Kerf (Country Director, LCC2C) and Robert Taliereio (Regional Director, ELCDR).

The chapters of the Cross-Cutting Themes Report were prepared by Guillermo Arenas, Natalia Leonor Campora, Sergiy Kasyanenko, Csilla Lakatos, Alen Mulabdievic and Shu Yu.

Substantive contributions to the synthesis report and country reports were made by Kazi Matin (synthesis report); Jean Nicolas Arlet, Francisco Arroyo Marioli, Natalia Leonor Campora, Sergiy Kasyanenko, Temel Taskin, and Gabriela Paz Zapata Roman (country reports); Jorge Guzman, Steven M. Pennings and Rishabh Sinha (background papers). Samuel Jaime Pienknagura contributed to the initial design of the study.

Luis Rojas provided outstanding research assistance, as did Marco Cobanera in the initial stages of the report.

The team appreciate the advice and guidance from the following Central American country economists: Rafael Barroso, Elena Bondarenko, Simon Davies, Tamoya Annika Lois Christie, Aygul Evdokimova and Eduardo Olaberria. The team is also grateful for valuable comments and insights received from Barbara Cunha, Ewa Joanna Korczyc, James Robert Ezequiel Sampi Bravo, Ekaterina Vostroknutova and David E. Yuravlivker. The reports were peer reviewed by Jose Lopez Calix (Lead Economist, EA2M1), Barbara Cunha (Senior Economist, ELCMU), Roberto Fattal Jaef (Economist, DECMG), Julie Rozenberg (Senior Economist, SLDR) and Marc Schiff Bauer (Senior Economist, EECDM2).

Editing support was provided by Katherine Shafer Coleman, Anne Davis, Suzana Abbott, and Anjali Kishore Shahani Moreno. Administrative assistance was provided by Giselle Velasquez, Miriam Beatriz Villarroel, and Elizabeth Sanchez. The Synthesis Report was designed by Alejandro Espinosa/sonideas.com and its overall dissemination was organized by Anne Davis, Cynthia Flores Mora, Cesar Armando Leon Juarez, Marjorie Jhoanna Delgado Aguirre and Susana Hortensia Mendez Madrid.
Central America comprises a diverse set of countries, including two high-middle-income countries (Costa Rica and Panama), two of the poorest countries in Latin America and the Caribbean (Honduras and Nicaragua), and two middle-income economies (Guatemala and El Salvador). The northern part of Central America (Guatemala, Honduras, El Salvador, and Nicaragua) accounts for half of the region’s economic activity, with Costa Rica and Panama in the south accounting for the other half. The north has a much higher population with a much lower income per capita. The total size of the six countries’ combined economies is about US$265 billion, or equivalent to the seventh-largest economy in the Latin America and Caribbean (LAC) region after Brazil, Mexico, Argentina, Colombia, and Chile. Individually, Guatemala is the largest economy (US$78 billion), followed by Panama (US$66 billion) and Costa Rica (US$59 billion). On average, the Central America (CA) sub-region is more open, participates more in global value chains (GVCs), attracts more foreign direct investment (FDI), and receives much larger remittances and official development assistance (ODA) than the average for the LAC region (see Annex 1). The topography of the region, with tropical ranges in the south, deserts in the north, and mountain chains cutting across it, does not facilitate intra-regional integration by land. Honduras borders three other countries and the rest of the countries border two, except for Panama that borders only one. This implies the need for numerous border crossings for goods to reach several relatively small markets.

The Central America sub-region has seen higher per capita income growth than the average across the LAC region over the past two decades. During 2000-2014, Central America’s per capita income grew at an average rate of 2.3 percent compared to 1.9 percent of LAC average, with an even wider difference during the 2015–17 period, when commodity-dependent countries in LAC went into recession. This performance has been driven largely by Panama (4.4 percent) and Costa Rica (2.7 percent). Nicaragua also advanced at 2.3 percent during those periods. With this growth came a slow but steady reduction in poverty, which, if measured at US$5.5 per person/day, impacted less than 15 percent of the population in both Costa Rica and Panama in 2019, but unfortunately around half of the population in Honduras and Guatemala, and about 35 percent in Nicaragua and 25 percent in El Salvador (in income per capita terms, Honduras and Nicaragua remain the poorest in the region after Haiti).

Low productivity and weak institutions are behind the modest economic growth in Central America in recent years. There is a significant share of informality in the countries of the sub-region, and economic activity relies on low value-added sectors such as agriculture, retail and services, and tourism, which in turn provide the bulk of low-skilled jobs. Human development outcomes are poor in most of these countries (with the exception of Costa Rica) due to low investments in human capital and inefficiencies in the delivery of social services. The quality of infrastructure is poor: Central American countries lag peers in most connecting and accessibility infrastructure. In specific cases, the countries’ benchmarks declined significantly in the past four years (Guatemala).

Both the common features and striking differences among Central American countries provide a fertile ground for exploiting complementarities. Common features include: (i) strong economic links to the United States; (ii) high labor mobility across countries and a high level of informality; (iii) the relatively poor quality of infrastructure, including border crossings; (iv) a concentration of poverty in rural areas, with a low provision of public services, that affect particularly vulnerable groups such as indigenous and Afro-descendent populations; and (v) a high exposure to natural disasters and economic and financial volatility. But the countries’ differences are more noteworthy than their similarities. These differences include, for example, the high quality of...
institutions and human capital in Costa Rica compared to the rest of the sub-region, or the success of Panama in creating a logistics and services hub, despite the country’s low level of human capital, on average, and high rates of informality. If Central America were a single country, Costa Rica and Panama would qualify as the key poles of its development. These differences among countries are worth exploiting to find market complementarities.

Integration has proceeded selectively, mainly as it relates to managing the transmission network for electricity and coordinating trade negotiations, especially with the United States and Europe. In 1993, all six countries formed the Central American Integration System (Sistema de la Integración Centroamericana—SICA) to strengthen a unified region. In 2005, all but Panama formed the Central America and Dominican Republic Free Trade Area with the United States (CAFTA-DR) that significantly boosted trade and investment between Central America (and the Dominican Republic) and the United States. Other regional institutions include the Central American Bank for Economic Integration (CABEI) and the common dispatch for the power grid. The institutional set-up for integration notwithstanding, there has been little progress in establishing trade integration with China either as a sub-region or as individual countries.

There are only a handful of results to show in terms of intra-regional integration. Despite important discussions and many studies carried out by SICA, little progress has been made to build the infrastructure needed for regional integration, including especially, ports and roads. One example of progress is the successful agreement toward a common border post between Honduras and Guatemala, but this covers only two out of the five key border crossings.

The economies of each of the six countries in the sub-region were heavily affected by COVID-19. Containment measures and the consequent deep global crisis are expected to result in the sub-region’s deepest contraction in recent times, with the countries’ economies estimated to have contracted by 7.8 percent on average in 2020 (higher than the estimated contraction of 6.7 percent for LAC). The key channels affected include tourism and trade in all six countries, and remittances in the three northern Central American countries and Nicaragua. Around four million people are expected to fall into poverty by the end of 2020, adding to the existing 17 million living in poverty (US$5.5/day at 2011 purchasing power parity—PPP). This would bring poverty rates in the region to 43 percent of the overall population of 48 million Central Americans (up from 35 percent in 2019).

In order to restore economic activity in the short run and increase potential output over the long run, Central America should launch coordinated policy action in five areas: (i) GVCs; (ii) trade integration; (iii) formalization; (iv) management of volatility; and (v) remittances (for the northern Central American countries). The findings and recommendations emerging from these analyses below are presented below.

**Exploiting the Growth Potential of GVCs**

Central America’s participation in GVCs is higher than the LAC average, and is highly integrated with the United States. The United States receives more than 50 percent of the sub-region’s domestic value-added in exports (that is, forward linkages) and provides 38 percent of the sub-region’s inputs used in the production of exports (backward linkages). Measured by the share of domestic value-added in exports in 2015, the textiles and apparel sector is the most integrated (with 21 percent of exports), reflecting the impact of the maquilas in the northern Central American countries. This sector is followed by agriculture, electrical and machinery, and food and beverages (each representing around 15 percent of exports). The participation of Central America in GVCs expanded significantly during this past decade, especially in Panama, where the domestic value-added of exports grew at 7.6 percent, followed by Nicaragua and Guatemala at 6.6 percent, Costa Rica at 5.8 percent, El Salvador at 4.7 percent, and Honduras at 3.6 percent. Central America exports mostly final products, but for the most part they are of low sophistication. Panama has also set up a re-export business line, where the value added is in retail services.

The sub-region’s expanding GVC participation provides a platform to revive its growth engine in post COVID-19 times, but further exploiting the growth potential of GVCs requires tapping into the synergies among countries as a cluster. It is not feasible to continue treating each country as an individual island, as has
been the case so far. Perhaps with the exception of Guatemala, each country is geographically, economically, and demographically too small to handle significant integration into GVCs. In practical terms, a simple two-pronged economic policy for the sub-region should be successful, yet in the past this has been politically complex to design, coordinate, and sustain. All six countries would benefit from the forward and backward linkages that would result if a steady and concerted effort is made to reduce the time and cost of crossing borders and transporting goods. The development of a single, harmonized, and digitalized border crossing process for all intra-regional trade could drive the time costs to near zero. Furthermore, it is essential that capital and labor flow easily across the borders as well. FDI is an essential condition for the integration into GVCs, and efforts must be made to establish a level playing field at the sub-regional level so that FDI is allocated across the sub-region based on each individual country's comparative advantage rather than incentives. Labor and talent should also be allowed to move freely.

Capturing Efficiency Gains from Intra-Regional Trade
A Computable General Equilibrium (CGE) model has been used to estimate the economic gains of increasing intra-regional trade in Central America by reducing trade and transport costs. Trade costs have been found to be very high in Central America, with intra-regional tariffs estimated at 76 percent on average, ranging from 91 percent in El Salvador to 64 percent in Panama. At the bilateral level, the highest bilateral tariffs are between Panama and El Salvador and between Honduras and El Salvador. At the same time, Central America’s investment in transport infrastructure amounted to only 1.1 percent of regional GDP in 2017, below the LAC average of 1.5 percent and significantly below the estimated 6.2 percent needed to satisfy medium-term infrastructure demand. On average, transport costs amount to US$0.17 per ton-kilometer in Central America, much higher than the estimated US$0.06–0.11 in Sub-Saharan Africa and US$0.02–0.05 in advanced economies. On average, transport costs account for about 2.6 percent of firms’ non-value-added expenditures in Central American countries, with Guatemala and Honduras having the highest costs. In sectors more dependent on transportation, such as agriculture and food products, the share of transport costs is higher, at 4.5 percent.

Given the above statistics, there is considerable room to improve intra-regional trade, and significant welfare gains to be realized from doing so. This paper presents four policy scenarios: First, full implementation of the World Trade Organization’s (WTO) Trade Facilitation Agreement (TFA) is estimated to reduce trade costs by 15.5 percent, increase intra-regional trade by 61 percent, and increase the sub-region’s GDP by 4.3 percent by 2030. For instance, between Guatemala and Costa Rica, trade costs are assumed to decline from the current 74 percent to 62.5 percent, a decline of 15.5 percent that occurs in equal amounts annually from 2019–2030. Gains for El Salvador and Honduras are estimated to be the highest by 2030, boosting those countries’ GDP by 8.8 percent and 5.2 percent, respectively. Second, extending the implementation of WTO’s TFA to Mexico would increase trade between Central America and Mexico by 130 percent and Central America’s GDP by 6.7 percent by 2030. Third, a 10 percent decline in intra-regional transport costs could boost intra-regional trade by 5 percent and the sub-region’s GDP by 0.3 percent by 2030. El Salvador would benefit the most from decreased transport costs, with an estimated increase of 0.8 percent in its GDP, and Panama the least, with an estimated 0.1 percent increase. Fourth, extending the reduction in transport cost between Central America and Mexico would increase the sub-region’s GDP by 0.4 percent by 2030.

The results suggest that regional collaboration to decrease trade and transport costs within the sub-region as well as with Mexico have the potential to produce substantial gains for all Central American countries. The sub-region’s competitiveness, trade, and output can increase significantly if the political will exists to achieve integration. This would entail strong political empowerment and financial support to SICA, effort to upgrade the region’s infrastructure, and the removal of trade and non-trade barriers (even at the relatively low common denominator of WTO’s TFA).

Harnessing the Demographic Bonus in the Informal Economy
The informal sector represents a pool of sub-utilized labor available that would allow Central American countries to accelerate growth. Central America’s informal output and employment stood at 39 percent of GDP and 40 percent of employment in 2016. These figures are higher in the same period than those of LAC (32
and 34 percent, respectively) and well above those of advanced economies (18 and 16 percent, respectively). By most measurements, Costa Rica has the smallest informal economy, and Guatemala, Nicaragua, and Honduras have the largest. Both the informal output and employment in the sub-region have been declining during the last decade, though they are still high and thus limit the sub-region’s growth potential. Like other countries and regions around the world, Central America’s informal sector has lower productivity than its formal sector. An exception among the six countries is Panama, where workers in the informal sector are, on average, as productive as their counterparts in the formal sector. In the other five countries, especially Honduras and Nicaragua, labor productivity in the informal sector is much lower than in the formal sector, suggesting that policy interventions may be needed to address this.

A cross-sectional regression model with interaction terms has been employed to assess the determinants of informality in the six Central American countries. Estimates suggest that informality in Central America is associated with lower levels of development, human capital, and trade. Thus, scaling up basic education, targeted skills (vocational) training, and support programs for small and medium enterprise (SME) and farms, together with expanding GVC participation and reducing trade and transport costs to deepen trade, would help decrease informality and increase productivity. Improving the broad business environment would also be important, given that burdensome regulations and corruption are positively correlated with informality in Central America. The results also suggest that in Central America, improving human capital would help boost labor productivity in the informal sector more than improving access to credit.

Managing Volatility from Trade and Financial Flows

The United States is the biggest trading partner of Central American countries and the major source of their remittances. About 90 percent of remittances to El Salvador, Guatemala, and Honduras and 50 percent of remittances to Nicaragua originated from the United States in 2017. The sub-region’s dependence on the United States for trade and remittances makes it vulnerable to shocks in the U.S. economy—not the least of which has been the impact of COVID-19 recently on the unemployment rate of the Latino population in the United States.

This paper estimates the effect of economic uncertainty in the United States on remittances to, exports from, and output of Central American economies. Using monthly data over the 2005–2018 period and the Vector Auto Regressive (VAR) model, the analysis found that Central American countries are impacted negatively by economic uncertainty in the United States. A one-standard-deviation of uncertainty shock to the United States’ economy is associated with a decline in the United States’ industrial output of 0.5–0.8 percent during the 10–14 months following the shock. Economic output in Central America is estimated to decline by 0.2–1.0 percent between 2–20 months after the shock, depending on the country and the transmission channels considered. Countries with strong trade relationships with the United States, such as Costa Rica and Panama, as well as El Salvador and Honduras, are those most affected by the shock. The remittances channel is stronger than or as important as the trade channel for Guatemala, Honduras, Nicaragua, and El Salvador. The estimates show a decrease of up to one percent in remittances for Guatemala, Nicaragua, and El Salvador. However, for Honduras, the impact on remittances is positive. One explanation could be that these uncertainty shocks also increase the perceived heightened risk of deportation for Honduran migrants, which in turn increases their remittances. Honduras and Guatemala have seen substantial increases in remittances during the last two years, coinciding with various uncertainties in the United States.

These results suggest that Central American countries will need to build external fiscal and financial buffers to address volatility. They should also seek to insure themselves against the negative shocks in the United States when cost effective, using both multilateral (flexible credit arrangements) and market instruments.
Enhancing the role of remittances in consumption smoothing and productive investment

Remittance inflows to Central America surged from less than US$80 million in 1980 to over US$24 billion in 2019, and about 80 percent of these remittances originated from the United States. Although the impact of remittances on poverty and inequality in Central America has been well-documented, their impact on growth and productivity is not clear-cut. Remittances can promote growth and productivity by reducing poverty and increasing investment, entrepreneurship, and human capital, among others. However, they can also distort labor markets by creating remittance dependence, increasing reserve wages, and promoting brain drain, and can reduce the competitiveness of the recipient country by causing “Dutch disease.”

In Central America, remittances seem to have promoted growth by decreasing poverty and increasing consumption and access to education. However, productivity in the sub-region has been stagnating despite a big surge in the sub-region’s remittance inflows in recent decades. Among the factors contributing to the weak linkages between remittances and productive economic activities are the fact that the beneficiaries of remittances are more likely to live in rural areas, operate in the informal sector, and have lower education and entrepreneurial skills than the population average. Moreover, shallow financial markets, the large informal economy, weak infrastructure and institutions, and high rates of crime and violence increase the risk for remitters and recipients to invest in productive investments. Country-level reforms that improve the business environment, deepen the financial system and promote systematic programs to attract more remittances and channel them into productive investment are likely to raise the productive potential of remittances. Given that the recipients of remittances are predominantly women, supporting women entrepreneurs would increase the productive uses of remittances. Also, reducing the time and cost of money transfers and broadening the base of intermediaries might encourage savings and, thus, investments.

Summary of Policy Recommendations

Work on the first four cross-cutting issues yields a set of policy recommendations, where coordinated policy action by all countries should be a priority, while the work on remittances leads to a key country-level agenda. Table 1.1 summarizes these recommendations by topic, and attempts to prioritize them as high, medium, or low priority. Many of the recommendations are not new—they have been made several times in other analytical documents. Therefore, it would be important to consider all potential political economy barriers to the design, launch, and sustained implementation of the measures proposed. A full political and institutional assessment of the reforms is recommended. In the interim, a subjective view is offered on the likely difficulties each reform might experience.

Summary of Areas Requiring Coordinated Policy Action to Unleash Cross-Country Productivity Gains

<table>
<thead>
<tr>
<th>Policy Recommendation</th>
<th>Priority</th>
<th>Political Economy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exploiting the growth potential of GVCs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reduce tariffs and non-tariff barriers</td>
<td>H</td>
<td>H</td>
</tr>
<tr>
<td>Streamline border crossing procedures</td>
<td>H</td>
<td>M</td>
</tr>
<tr>
<td>Improve transport and logistics connectivity</td>
<td>H</td>
<td>M</td>
</tr>
<tr>
<td>Develop a common regional policy for FDI incentives</td>
<td>M</td>
<td>L</td>
</tr>
<tr>
<td>Assess policies to attract and allocate talent to complement the region's human capital and skills</td>
<td>L</td>
<td>M</td>
</tr>
<tr>
<td>Capturing efficiency gains from intra-regional trade</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fully implement the WTO’s Trade Facilitation Agreement among the six countries and with Mexico</td>
<td>H</td>
<td>M</td>
</tr>
</tbody>
</table>
### Executive Summary

**Policy Recommendation** | **Priority** | **Political Economy**
--- | --- | ---
Empower SIECA and SICA to lead this agenda, including financing instruments to allocate costs across countries fairly, and coordination instruments to secure budget space for these investments | H | M

**Better utilizing the demographic bonus in the informal economy**

- Scale up and improve vocational programs | M | L
- Scale up and improve SME and farm support programs | M | L
- Improve the business environment and reduce corruption | H | L

**Managing volatility from trade and financial flows**

- Build external fiscal and financial buffers | M | L
- When cost-effective, insure against negative shocks | L | L

**Managing Remittances in the northern Central American countries**

- Promote female entrepreneurship | M | L
- Reduce cost of remittances and broaden intermediaries | M | L

---

*Note: H: High (Priority or High Political Difficulty); M: Medium; L: Low.*
1. Capturing Efficiency Gains from Intra-Regional Trade*

This chapter uses a CGE model to estimate the economic gains of increasing intra-regional trade in Central America by reducing trade and transport costs. Trade costs are very high in Central America, with intra-regional tariff-equivalent trade costs at 74 percent of the value of traded goods, on average, and ranging from 91 percent in El Salvador to 64 percent in Panama. The highest bilateral trade costs are between Panama and El Salvador and between Honduras and El Salvador. Transport costs are also high in the sub-region, amounting to US 0.17 per ton-kilometer in Central America, well above the estimated costs of US$0.06–0.11 in Sub-Saharan Africa and US$0.02–0.05 in advanced economies. On average, transport costs account for about 2.6 percent of firms’ non-value-added expenditures in Central American countries, with Guatemala and Honduras having the highest costs. In sectors more dependent on transportation, such as agriculture and food products, the share of transport costs is higher, at 4.5 percent. This is partly due to low transport infrastructure investment. In Central America infrastructure investment represented 1.1 percent of sub-regional GDP in 2017, below the LAC average of 1.5 percent and significantly below the estimated 6.2 percent needed to satisfy medium-term infrastructure demand.

With these considerations in mind, this chapter presents four policy scenarios and their respective results: First, full implementation of the WTO’s TFA is estimated to reduce trade costs by 15.5 percent, increase intra-regional trade by 61 percent, and increase the sub-region’s GDP by 4.3 percent by 2030. Second, extending the implementation of the WTO’s TFA to Mexico would increase trade between Central America and Mexico by 130 percent and Central America’s GDP by 6.7 percent by 2030. Third, a 10 percent decline in intra-regional transport costs could boost intra-regional trade by 5 percent and the sub-region’s GDP by 0.3 percent by 2030. Fourth, reducing transport costs by 10 percent between Central America and Mexico would increase the sub-region’s GDP by 0.4 percent by 2030. These results suggest substantial gains for all Central American countries from regional collaboration to decrease trade and transport costs within them as well as with Mexico. The sub-region’s competitiveness, trade, and output could be significantly boosted, given strong political empowerment to SICA, upgrades in the sub-region’s infrastructure, and removal of tariff and non-tariff barriers (even at the relatively low common denominator of the WTO’s TFA).

1.1. Background

Central America remains among one of the least integrated sub-regions in trade. On average, only about 17 percent of Central America’s total trade flows are accounted for by intra-regional trade, compared, for instance, to above 51 percent and 68 percent in the East Asia and Pacific and Europe and Central Asia regions, respectively. El Salvador and Guatemala export relatively more intra-regionally, with 42 percent and 32 percent of total exports, respectively, while Nicaragua and El Salvador source a higher share of their imports from other Central American countries, at 24 percent and 21 percent, respectively (Figure 1.1A). Trade integration (measured as total trade) with Mexico also varies: it is the highest for Nicaragua (12 percent of total trade) and Guatemala (9 percent), and lowest for Panama (3 percent) and Costa Rica (5 percent; Figure 1.1B). As argued in Chapter 2, intra-regional trade is needed for exploiting the benefits of GVCs, among other reasons, but is stymied by high trade and transport costs, red tape, inefficient customs procedures, and infrastructural and logistical bottlenecks.

* Authored by Csilla Lakatos (Senior Economist, ESADR).
This chapter analyzes the economic impacts of two policy changes that would result in higher intra-regional trade, as well as in higher long-term productivity and growth. In the first scenario, the impact of improving the six Central American countries (C6) trade facilitation indicators is quantified through a reduction of 15.5 percent in: (i) C6 intra-regional trade costs; and (ii) C6 intra-regional and C6-Mexico trade costs. In the second scenario, the impact of a 10 percent decline in the following indicators is analyzed: (i) C6 intra-regional transport costs; and (ii) C6 intra-regional and C6-Mexico transport costs.

Previous trade tensions between the United States and China, and the impact of COVID-19 on flows, might generate a sense among policy makers that growth can come without easing trade. However, as well presented in Baldwin and Evenett (2020), turning inward will not work in general, nor in the particular case of the C6. Their argument is simple: trade barriers will make it harder to respond to COVID-19, which requires a free flow of medical suppliers. Also, trade openness is part of the solution for the recovery, as it has been found unequivocally to promote high quality employment, growth and prosperity.

**Figure 1.1. Regional trade integration of C6, 2016**

**A. Intra-regional trade**

<table>
<thead>
<tr>
<th>Country</th>
<th>Exports to other C6</th>
<th>Imports from other C6</th>
<th>Trade with C6</th>
</tr>
</thead>
<tbody>
<tr>
<td>CRI</td>
<td>10</td>
<td>8</td>
<td>18</td>
</tr>
<tr>
<td>GTM</td>
<td>14</td>
<td>12</td>
<td>26</td>
</tr>
<tr>
<td>HND</td>
<td>18</td>
<td>16</td>
<td>34</td>
</tr>
<tr>
<td>NIC</td>
<td>20</td>
<td>18</td>
<td>38</td>
</tr>
<tr>
<td>PAN</td>
<td>22</td>
<td>20</td>
<td>42</td>
</tr>
<tr>
<td>SLV</td>
<td>25</td>
<td>24</td>
<td>49</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Country</th>
<th>Exports to Mexico</th>
<th>Imports from Mexico</th>
<th>Trade with Mexico</th>
</tr>
</thead>
<tbody>
<tr>
<td>CRI</td>
<td>5</td>
<td>4</td>
<td>9</td>
</tr>
<tr>
<td>GTM</td>
<td>9</td>
<td>8</td>
<td>17</td>
</tr>
<tr>
<td>HND</td>
<td>13</td>
<td>12</td>
<td>25</td>
</tr>
<tr>
<td>NIC</td>
<td>17</td>
<td>16</td>
<td>33</td>
</tr>
<tr>
<td>PAN</td>
<td>21</td>
<td>20</td>
<td>41</td>
</tr>
<tr>
<td>SLV</td>
<td>24</td>
<td>23</td>
<td>47</td>
</tr>
</tbody>
</table>

Note: Includes goods trade only. Trade refers to the sum of exports and imports. Data represent 2016 trade flows.

### 1.2. Methodology

The model underlying the simulations is GDyn—a dynamic, multi-region, multi-sector, and multi-factor computable general equilibrium (CGE) model (Ianchovichina and McDougall 2000; Ianchovichina and Walmsley 2012). The GDyn model is calibrated using the GTAP 9 database representing the global economy in 2011 (Aguiar, Narayanan, and McDougall 2016). For the purpose of the simulations, the GTAP database was aggregated into 17 sectors (vegetables and fruits; other agriculture; energy; meat; other food; beverages and tobacco; textiles; wearing apparel; motor vehicles; machinery; other manufactures; construction; trade; transportation; public administration; business services; and other services) and 15 countries/regions (Costa Rica, Guatemala, Honduras, Nicaragua, Panama, El Salvador, United States, Mexico, Argentina, Brazil, Colombia, the rest of Latin America, the European Union, China, and the rest of the world).

The core specification of the GDyn model broadly replicates a standard global dynamic CGE model. Production is specified as a series of nested constant elasticity of substitution functions using various inputs: unskilled and skilled labor, capital, land, natural resources (sector-specific), energy, and other intermediate inputs. Demand by each domestic agent is specified at the so-called Armington level, that is, demand for a bundle of domestically produced and imported goods. Armington demand is aggregated across all agents and allocated at the national level between domestic production and imports by region of origin. The model is of a recursive dynamic type and is characterized by capital accumulation, adaptive expectations, and convergence to the steady state.
The dynamic baseline scenario follows key macroeconomic projections such as GDP, population, and skilled and unskilled labor until 2030. GDP growth data is based on projections from the World Bank’s latest *Global Economic Prospects* report (World Bank 2019b). Population growth is based on the medium fertility variant of the United Nation’s 2012 population projections. All counterfactual scenarios are discussed in reference to the baseline in order to isolate the marginal impact of various policy changes. The model is ideal for measuring the impact of policies that have wide ranging effects, as it takes into consideration general equilibrium linkages. These include interactions between consumers, producers, and governments; inter- and intra-industry links; interactions between domestic and foreign markets; investment decisions and resource constraints.

### 1.3. Results

#### 1.3.1. The impact of improvements in trade facilitation

The time and costs of trading goods in Central America remain high, but C6 countries have made progress in implementing their WTO TFA commitments. Central American countries were all signatories to the TFA in 2014, which they subsequently ratified between 2015 and 2017. Overall, close to 76 percent of TFA commitments have been implemented in the sub-region. Across Central American countries, the rate of implementation of commitments varies significantly, with Costa Rica having implemented close to 98 percent, followed by Panama (83 percent), down to the lowest two, Honduras (58 percent) and Guatemala (64 percent) (Figure 1.2A).

Implementing the WTO’s TFA could reduce trade costs by 15.5 percent in Central America (Moise and Sorescu 2013). Trade costs6 in Central America remain high, at an intra-regional average tariff equivalent of 74 percent of the value of traded goods. Average trade costs are estimated7 to be the highest in El Salvador (91 percent) and Honduras (80 percent) and lowest in Panama (64 percent) (Figure 1.2B). At the bilateral level, the highest trade costs are between Panama and El Salvador and Honduras and El Salvador (Arvis et al. 2016) (Figure 1.2B). In the simulations described below, a 15.5 percent decline in the bilateral trade costs shown in Figure 1.2B are implemented gradually over the course of the simulation period 2019–2030. For instance, between Guatemala and Costa Rica, trade costs are assumed to decline from the current 74 percent to 62.5 percent, a decline of 15.5 percent that occurs in equal annual yearly amounts over the 2019–2030 period. The proposed trade reform is obviously modest, far from a seamless trade in goods as high trading costs still remain high.

Improvements in trade facilitation through the reduction of intra-regional trade costs are expected to boost intra-regional trade, output, and investment, and benefit consumers. Higher intra-regional export demand has several implications for domestic markets in Central America: to satisfy this increased demand for their export products, countries expand domestic supply, which in turn results in an increase in demand for imported intermediates and an aggregate increase in imports. Consumers benefit from lower prices and higher wages. Increased activity boosts rates of return on capital and leads to an increase in investment, both domestic and foreign.

Gradual improvements in intra-regional trade facilitation resulting in the reduction of trade costs could translate into significant gains for Central America, increasing sub-regional GDP by up to 4.3 percent by 2030 (Figure 1.2C). Gains for El Salvador and Honduras (currently the worst performers on trade cost indicators) could be the highest, boosting their GDP by 8.8 percent and 5.2 percent, respectively, by 2030 (Figure 1.2C). If improvements in intra-regional trade facilitation are combined with further improvements in trade facilitation with Mexico, C6 regional gains could be more than 50 percent larger, with an estimated 6.7 percent increase in sub-regional GDP by 2030. In relative terms, comparing the change in each country’s GDP with and without Mexico, adding Mexico would benefit Costa Rica and Panama the most, due to their relatively stronger bilateral trade ties, with an increase in GDP of 7.1 percent and 3.2 percent, respectively (Figure 1.2C). Intra-regional trade could increase by 61 percent. Costa Rica’s and Panama’s exports to other C6 countries are estimated to increase the most, by 80 percent and 71 percent, respectively. On the other hand,
El Salvador and Costa Rica would increase imports from other C6 countries the most, by 90 percent and 62 percent, respectively (Figure 1.2D). On average, Central America’s trade with Mexico is estimated to increase by more than 130 percent, with Honduras nearly doubling its exports to, and El Salvador its imports from, Mexico.

**Gains in C6 countries of decreasing their bilateral trade costs would be driven by a significant boost in investment, which would be higher if the reduction in trade costs include Mexico (Figure 1.2E).** The highest increase in investment would be in El Salvador and Honduras, both with and without Mexico. Panama, on the other hand, benefiting from a relatively smaller decline in trade costs, would attract less investment than other C6 countries and would benefit the least compared to other C6 countries.

**Decreasing trade costs by improving trade facilitation could boost Central America’s competitiveness, improve diversification, and help in upgrading production to higher value-added manufactures.** The reduction of red tape at the border is expected to benefit small- and medium-sized firms the most and encourage their participation in international trade (UN ECLAC 2017). The increase in investment across countries leads to the expansion of the construction services sector, which is found to contribute the most to the increase in domestic output, followed by trade (wholesale and retail) and other manufactures. Intra-regional trade facilitation would allow C6 countries to become more competitive in higher value-added manufacturing and services sectors and lead the textiles and wearing apparel sector to contract, except in Honduras (Figure 1.2F). Sectoral results are broadly comparable for the simulation that includes Mexico.

**Figure 1.2. The effects of decreasing trade costs by improving trade facilitation**

**Figure 1.2A. TFA commitments implemented**

**Figure 1.2B. Intra-C6 trade costs (percent of the value of traded goods)**

**Figure 1.2C. Impact of a 15.5 percent decrease in bilateral trade costs on GDP by 2030**

**Figure 1.2D. Impact of a 15.5 percent decrease in bilateral trade costs on trade by 2030**
Transport infrastructure investment in Central America amounted to 1.1 percent of sub-regional GDP in 2017, below the LAC average of 1.5 percent and significantly below the estimated 6.2 percent needed to satisfy medium-term infrastructure demand.\textsuperscript{10} Infrastructure investment was even lower than average in Guatemala (0.3 percent of GDP) and El Salvador (0.9 percent) (Figure 1.3A). By 2019, at only around 1 percent of GDP, infrastructure investment in Costa Rica was no better. The lack of transport infrastructure, inefficiencies, and bottlenecks contribute to the high transport and trade costs in the region, with negative consequences for long-term productivity and growth. On average, transport costs amount to US$0.17 per ton-kilometer in Central America, much higher than the estimated US$0.06–0.11 in Sub Saharan Africa and US$0.02–0.05 cents in advanced economies (Schwartz 2012; Osborne, Pachon, and Araya 2014). An increase in transport infrastructure investment would not only contribute directly to growth, but also reduce transport costs and boost the sub-region’s competitiveness and exports.

On average, transport costs account for about 2.6 percent of firms’ non-value-added expenditures in C6 countries, with Guatemala and Honduras having the highest costs (Figure 1.3B). The share of transport costs is higher in those sectors that rely more on transportation, such as agriculture and food products, (4.5 percent). A decline in transport costs would benefit firms through a reduction in input costs, which, in turn, could lead to the expansion of output and exports. Lower transport costs could also reduce prices for consumers, improving their purchasing power, thereby contributing to higher investment and growth.

A 10 percent decline in intra-regional transport costs could boost Central America’s GDP by 0.3 percent by 2030 and by 0.4 percent if the decrease in transport costs includes Mexico.\textsuperscript{11} El Salvador is estimated to benefit the most, with a 0.8 percent increase in GDP, followed by Guatemala with a 0.4 percent increase, and Panama the least, by 0.1 percent (Figure 1.3C). By 2050, the decline in transport costs would boost intra-C6 trade by 5 percent. Honduras and Costa Rica are estimated to increase exports to other C6 countries the most, by 5.9 percent and 5.7 percent, respectively (Figure 1.3D). Model results show that the increase in output as a result of a 10 percent decrease in transport cost will be mainly through an increase in investment (Figure 1.3E). If the decline in transport costs were to extend to C6 trade with Mexico, Costa Rica and Guatemala would benefit the most and El Salvador the least (Figure 1.3E). At the sectoral level, the decrease in the transport cost in C6 will boost the output of construction services and other sectors such as machinery, other manufactures, and trading services (Figure 1.3F).
**Figure 1.3. The effects of a 10 percent decline in transport costs**

- **Figure 1.3A.** C6 transport infrastructure investment, 2017
- **Figure 1.3B.** C6 firms’ transport expenditures, 2011
- **Figure 1.3C.** Impact of a 10 percent decrease in transport cost on GDP by 2030
- **Figure 1.3D.** Impact of a 10 percent decrease in transport cost on intra-regional trade by 2030
- **Figure 1.3E.** Impact of a 10 percent decrease in transport cost on GDP components by 2030
- **Figure 1.3F.** Impact of a 10 percent decrease in transport cost on sectoral output by 2030

Source: World Bank, GTAP database, Infralatam. A. Data for El Salvador is for 2015, for all remaining countries it is for 2017. B. Transport costs as share of firms' non-value-added expenditures. C. D. E. F. Estimates are based on simulations using the dynamic GTAP (GDyn) CGE model. Percent changes in volumes reported relative to the baseline scenario in 2030. E. F. Agriculture and food, energy, wearing apparel, public administration, and business services sectors are modelled but not included in the chart due to small impacts.
1.4. Conclusion and policy recommendations

Intra-regional trade and integration in Central America are currently stymied by high trade and transport costs. These are mainly driven by red tape, inefficient customs procedures, and infrastructural and logistical bottlenecks, with adverse effects on long-term productivity and growth. This chapter used a dynamic CGE model to estimate the economy-wide impacts of improvements in intra-regional trade facilitation and a decline in transport costs to boost regional integration and growth in Central America.

Results suggest that implementing the WTO’s TFA that are estimated to result in a 15.5 percent reduction in trade costs could increase Central America’s GDP by up to 4.3 percent by 2030. Gains for El Salvador and Honduras are estimated to be even higher, boosting their GDP by 8.8 percent and 5.2 percent, respectively, by 2030. Intra-regional trade could increase by 61 percent. If, in addition to the reduction in intra-regional trade costs, bilateral trade costs of C6 trade with Mexico were also to improve, C6 regional gains could be more than 50 percent higher, with an estimated increase in regional GDP of 6.7 percent by 2030. On average, Central America’s trade with Mexico could increase by more than 130 percent.

A 10 percent decline in intra-regional transport costs could boost Central America’s GDP by 0.3 percent by 2030. El Salvador is estimated to benefit the most from this scenario, with an increase in GDP of 0.8 percent, and Panama the least, with a 0.1 percent increase. The decline in transport costs would boost intra-C6 trade by 5 percent by 2030. If the decline in transport costs were to extend to C6 trade with Mexico, benefits for the sub-region could be close to one-quarter higher, increasing GDP by 0.4 percent by 2030.

The sub-region’s competitiveness, trade and output can be significantly boosted by a strong political mandate and a borrowing allowance to Central American Integration System (SICA). This could operationalize its mandate to upgrade infrastructure needed for regional trade in a swift manner and allocate the cost across the six countries (or collect the necessary transfers and/or revenues). The mandate should also be strengthened to remove trade and non-trade barriers (at least to the relatively low common denominator of WTO’s TFA, but preferably much beyond). Time of import procedures should also be reduced at the sub-region’s internal borders. The development of a single, harmonized, and digitalized border crossing process for all intra-regional trade can potentially drive the time costs to near zero.
Lunes 23/September 2013

Temas: Particiones y Unidades Lógicas

Objetivo: aprender a identificar unidades de almacenamiento.

Práctica: Convertir unidades de medida de unidades lógicas.

1 byte = 8 bit
1 kilobyte = 1024 bytes
1 megabyte = 1024 kilobytes

Conversión de Unidades

10 GB x 1024 MB = 10,240 MB
2. Exploiting the Growth Potential of GVCs*

Central America’s participation in GVCs is higher than the LAC average, due to strong integration with the United States which receives more than 50 percent of the sub-region’s domestic value added in exports (forward linkages) and provides 38 percent of the sub-region’s inputs used in the production of its exports (backward linkages). Measured by the share of domestic value added in exports in 2015, textiles and apparel are the most integrated sector (with 21 percent of exports), reflecting the impact of maquila industries in the northern Central American countries. This sector is followed by agriculture, electrical and machinery, and food and beverages (each with around 15 percent of exports). The participation of Central America in GVCs expanded significantly during the past decade, especially in Panama, where the domestic value added of exports grew at 7.6 percent, followed by 6.6 percent in Nicaragua and Guatemala, 5.8 percent in Costa Rica, 4.7 percent in El Salvador, and 3.6 percent in Honduras. Central America exports mostly final products, largely of low sophistication. Panama has also set up a re-export business line, where the value added is in retail services. The sub-region’s increased GVC participation provides a platform to revive the growth engine post-COVID-19, for the benefit of all six countries.

As argued in this and the next chapter, further exploiting the growth potential of GVCs requires tapping into the synergies of the group of countries as a cluster, rather than treating each country as an individual island, as has been the case so far. Perhaps with the exception of Guatemala, each country is geographically, economically, and demographically too small to handle a significant integration into value chains. In practical terms, a simple two-pronged economic policy for the sub-region should be successful, yet in the past this has been politically complex to design, coordinate, and sustain. All countries will benefit from the forward and backward linkages that would result if a steady and concerted effort is made to reduce the time and cost of crossing borders and transporting goods. As mentioned in Chapter 1, the development of a single, harmonized, and digitalized border crossing process for all intra-regional trade could drive the time costs to near zero. In addition, it would be critical for capital and labor to flow easily across the borders as well. FDI is an essential condition for integration in GVCs, and efforts must be made to establish a sub-regional level playing field so that FDI is allocated across the sub-region based on each individual country’s comparative advantage rather than upon incentives.

2.1 Introduction

The production of goods has become increasingly unbundled, with countries positioning to integrate their economies into key global value chains (GVCs). COVID-19 might permanently alter these dynamics, particularly as a trend to “near-shoring” takes root. However, while this might alter the GVCs’ main “tectonic” clusters, namely those around North America, Germany and China, it might bring the same or even improved opportunities for the Central American countries to position themselves to contribute to high value segments of global production processes. Finding the right fit for each country and the sub-region’s skills and other endowments is the challenge, but recent country experiences offer important lessons. This chapter explores the nature of GVC integration in Central America and presents some stylized facts about trade in value-added terms using data from the Eora database (UNCTAD).

* Authored by Guillermo Arenas (Economist, ETIRI) and Alen Mulabdić (Analyst, ETIRI).
Although agricultural products have traditionally dominated their exports, countries in Central America also export manufacturing products associated with GVCs, such as textiles and apparel, automotive parts (northern Central American countries) and medical devices (Costa Rica). About half of Central America’s exports come from agricultural products like bananas, sugar, coffee, and cardamom (Figure 2.1). Textiles and apparel are the sub-region’s leading manufacturing exports, accounting for approximately 15 percent of sub-regional exports. The textile and apparel industry is important in El Salvador (45.4 percent of exports), Nicaragua (27.3 percent of exports), and Guatemala (14.9 percent of exports). Medical devices are the second-highest export manufacturing category by value, increasing from US$744 million in 2007 to US$2.9 billion in 2017, but are only significant in Costa Rica (20.1 percent of exports) and account for less than 0.5 percent of exports in the remaining Central American countries. Wire harnesses (ignition wiring sets for automobiles) are the sub-region’s fastest growing manufacturing export, growing in value from US$223 million in 2007 to US$1.1 billion in 2017. This industry reflects the initial integration with the auto industry in Mexico and is important in Honduras (9.3 percent of exports), Nicaragua (8.9 percent of exports), and, to a lesser extent, El Salvador (1.4 percent of exports).

**Figure 2.1. Central America Total Exports (2007 and 2017)**

Source: WB staff’s calculations using COMTRADE data.

### 2.2. Measuring Export Value Added

The composition and growth of domestic value added (DVA) over time takes a central role in a world dominated by the fragmentation of production. Analyzing trade based on value added rather than gross export flows more accurately accounts for a country’s economic relevance. Trade measured using value added data traces the contribution of inputs from abroad to a country’s gross exports, in order to generate estimates of exports in value added terms. This captures the value of the economy’s goods and services embodied in its exports, after accounting for the use of imports of intermediate goods and services.

What matters ultimately for a country is not gross exports, which may include a significant share of foreign value added (FVA) via imported inputs, but the DVA embodied in gross exports and its growth over time. An increase in DVA in gross exports over time signifies greater value addition within the country itself. Figure 2.2 demonstrates the decomposition of gross exports using the auto industry as an example. In this case, domestic value added consists of:

**I.** Value-added created in the auto industry (direct DVA);

**II.** Value-added created in other sectors supplying to the auto industry (indirect DVA) and re-imported intermediates (which have been previously exported); and

**III.** Value-added imported from abroad in terms of both intermediate inputs and services (FVA).
The textile and agriculture sectors have traditionally dominated both gross and value-added exports in Central America. Central America’s DVA in exports recorded single-digit growth (5.9 percent) between 2005 and 2015, with all sectors expanding save for the financial intermediation sector (Table 2.1). In 2015, the textile sector accounted for the largest share of total DVA in Central America’s exports, with a 21.3 percent share (down from 23.9 percent in 2005). The DVA of agriculture, the sector with the second-largest contribution to DVA in Central America’s exports, grew at 6.1 percent (CAGR), and its relative importance stayed around 15 percent of total DVA during this period.

Table 2.1. Central America: Domestic value added in exports by sector, 2005 and 2015

<table>
<thead>
<tr>
<th>Sector</th>
<th>Value (US$m) 2005</th>
<th>Value (US$m) 2015</th>
<th>DVA (%) 2005</th>
<th>DVA (%) 2015</th>
<th>CAGR (%) 2005–15</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>17,114</td>
<td>30,478</td>
<td>100.0</td>
<td>100.0</td>
<td>5.9</td>
</tr>
<tr>
<td>Textiles and Apparel</td>
<td>4,082</td>
<td>6,503</td>
<td>23.9</td>
<td>21.3</td>
<td>4.8</td>
</tr>
<tr>
<td>Agriculture</td>
<td>2,532</td>
<td>4,585</td>
<td>14.8</td>
<td>15.0</td>
<td>6.1</td>
</tr>
<tr>
<td>Electrical and Machinery</td>
<td>2,274</td>
<td>4,159</td>
<td>13.3</td>
<td>13.6</td>
<td>6.2</td>
</tr>
<tr>
<td>Food and Beverages</td>
<td>1,915</td>
<td>3,348</td>
<td>11.2</td>
<td>11.0</td>
<td>5.8</td>
</tr>
<tr>
<td>Transport</td>
<td>1,528</td>
<td>2,847</td>
<td>8.9</td>
<td>9.3</td>
<td>6.4</td>
</tr>
<tr>
<td>Petroleum, Chemical, and Mineral</td>
<td>1,309</td>
<td>2,630</td>
<td>7.7</td>
<td>8.6</td>
<td>7.2</td>
</tr>
<tr>
<td>Hotels and Restaurants</td>
<td>397</td>
<td>845</td>
<td>2.3</td>
<td>2.8</td>
<td>7.9</td>
</tr>
<tr>
<td>Other Manufacturing</td>
<td>454</td>
<td>805</td>
<td>2.7</td>
<td>2.6</td>
<td>5.9</td>
</tr>
<tr>
<td>Wood and Paper</td>
<td>475</td>
<td>797</td>
<td>2.8</td>
<td>2.6</td>
<td>5.3</td>
</tr>
<tr>
<td>Metal Products</td>
<td>352</td>
<td>668</td>
<td>2.0</td>
<td>2.2</td>
<td>6.6</td>
</tr>
<tr>
<td>Education, Health, and Other Services</td>
<td>295</td>
<td>594</td>
<td>1.7</td>
<td>2.0</td>
<td>7.3</td>
</tr>
<tr>
<td>Post and Telecommunications</td>
<td>273</td>
<td>503</td>
<td>1.6</td>
<td>1.7</td>
<td>6.3</td>
</tr>
<tr>
<td>Transport Equipment</td>
<td>253</td>
<td>430</td>
<td>1.5</td>
<td>1.4</td>
<td>5.4</td>
</tr>
<tr>
<td>Fishing</td>
<td>240</td>
<td>376</td>
<td>1.4</td>
<td>1.2</td>
<td>4.6</td>
</tr>
<tr>
<td>Wholesale Trade</td>
<td>177</td>
<td>369</td>
<td>1.0</td>
<td>1.2</td>
<td>7.6</td>
</tr>
<tr>
<td>Other</td>
<td>559</td>
<td>1027</td>
<td>3.3</td>
<td>3.4</td>
<td>6.3</td>
</tr>
</tbody>
</table>

Source: Authors’ calculations based on Eora database. Note: Sectors accounting for less than one percent of DVA in 2015 are grouped under “Other.” a./ Mineral refers to non-metallic mineral.
Central America’s DVA growth is driven by the textile, agriculture, and electrical and machinery sectors, and some countries (e.g., Panama) performed as good as many aspirational comparators. Figure 2.3 shows the growth in export DVA between 2005 and 2015, during which the pace of DVA growth in Central America as a sub-region was close to two points lower than in South America and East Asia and Pacific, but higher than the rest of LAC, which only includes the Caribbean and Belize. The growth of DVA in the sub-region was driven by Panama, Nicaragua, and Guatemala and not far from the averages for South America and East Asia and Pacific, especially for Panama. The textile, agriculture, and electrical and machinery sectors provided the largest contributions to DVA growth between 2005 and 2015, followed by the food and beverages, petroleum and chemical, and transport sectors (Figure 2.4).

**Figure 2.3. Annualized Growth of DVA in Exports (2005–2015)**

<table>
<thead>
<tr>
<th>Country</th>
<th>2005-2015 Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Panama</td>
<td>7.6</td>
</tr>
<tr>
<td>Nicaragua</td>
<td>6.6</td>
</tr>
<tr>
<td>Guatemala</td>
<td>6.6</td>
</tr>
<tr>
<td>Costa Rica</td>
<td>4.7</td>
</tr>
<tr>
<td>El Salvador</td>
<td>3.6</td>
</tr>
<tr>
<td>Honduras</td>
<td>3.6</td>
</tr>
<tr>
<td>South America</td>
<td>3.6</td>
</tr>
<tr>
<td>East Asia and Pacific</td>
<td>5.9</td>
</tr>
<tr>
<td>Central America</td>
<td>7.6</td>
</tr>
<tr>
<td>Rest of LAC</td>
<td>3.6</td>
</tr>
<tr>
<td>Mexico</td>
<td>3.6</td>
</tr>
</tbody>
</table>

**Figure 2.4. Central America: Contribution to DVA Growth by Sector (2005–2015)**

- Textiles and Wearing Apparel: 14.1
- Agriculture: 12.0
- Food & Beverages: 11.0
- Petroleum, Chemical and Non-Metallic Mineral: 8.4
- Transport: 7.7
- Hotels and Restaurants: 7.7
- Other Manufacturing: 7.7
- Wood and Paper: 7.7
- Metal Products: 7.7
- Education, Health and Other Services: 2.6
- Post and Telecommunications: 2.6
- Wholesale Trade: 2.1
- Transport Equipment: 1.9
- Other Manufacturing: 1.8

Source: Eora database.

Note: Sectors with contribution of less than 1 percent are not reported in Figure 2.4. Rest of LAC includes only the Caribbean and Belize.

Direct and indirect exports contribute equally to the growth of Central America’s DVA embedded in gross exports. The contributions of Central America’s direct and indirect DVA exports vary significantly across sectors. The textile sector’s contribution is almost entirely direct, which means that the majority of Central America’s exporting textile firms export their products directly to the international market without any further processing in the sub-region (Figure 2.5). Sectors related to energy and services, such as petroleum and wholesale trade, on the other hand, export indirectly, through their contributions to exports in the sub-region’s other sectors. These results highlight the fact that GVC integration can benefit not only the exporters, but also their suppliers, given that indirect exports account for half the growth of DVA in Central America, with direct exports accounting for the other half. The average contribution to direct exports in Central America is lower than the 69 percent contribution in LAC (Central America excluded).

A country’s relative position in GVCs can be analyzed by investigating the share of FVA (foreign value added) in its exports and the share of its DVA (domestic valued added) in other countries’ exports. The analysis of the origin of FVA in a country’s exports helps identify potential sources of technology and productivity spillovers (through intra-firm and arm’s length transfers). The analysis of the final destination of DVA, on the other hand, is crucial to evaluate the degree of exposure to foreign demand shocks.

North America remains the main partner for Central America in terms of GVC trade, although its importance has decreased slightly between 2005 and 2015. Figure 2.6 shows that North America is the largest destination for Central America in terms of value-added demand, but its share decreased from 59 in 2005 to 51 percent between in 2015. Other important destinations are Europe and Central Asia (ECA) and LAC (excluding Central America), which account for 22 and 20 percent, respectively, of exported DVA. Figure 2.7 shows the origin of Central America’s FVA in its exports. LAC (excluding Central America) is the second-largest source of FVA in Central America’s exports. Between 2005 and 2015, LAC increased its supply of FVA in Central America’s exports from 17 percent to 24 percent, while North America decreased its supply from 41 to 38 percent, indicating a reduction in Central America’s dependence on inputs from North America.
**Figure 2.5. Direct and Indirect Contributions of Sectors to DVA Growth in Central America’s Gross Exports, 2005–2015**

<table>
<thead>
<tr>
<th>Sector</th>
<th>Direct</th>
<th>Indirect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Agriculture</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>Fishing</td>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td>Mining and Quarrying</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Food and Beverages</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Textiles and Wearing Apparel</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Wood and Paper</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Petroleum, Chemical and Non-Metallic Mineral</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Metal Products</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Electrical and Machinery</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Transport Equipment</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Other Manufacturing</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Recycling</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Electricity, Gas and Water</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Construction</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Maintenance and Repair</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Wholesale Trade</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Retail Trade</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Hotels and Restaurants</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Transport</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Post and Telecommunications</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Financial Intermediation and Business Activities</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Public Administration</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Education, Health and Other Services</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Private Households</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Re-export and Re-import</td>
<td>5</td>
<td>5</td>
</tr>
</tbody>
</table>

**Source:** Eora database.

**Figure 2.6. Domestic Value Added Demand, by Destination (%)**

<table>
<thead>
<tr>
<th>Destination</th>
<th>2005</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>North America</td>
<td>58.5</td>
<td>51.2</td>
</tr>
<tr>
<td>Europe and Central Asia</td>
<td>20.9</td>
<td>22.3</td>
</tr>
<tr>
<td>Latin America and Caribbean</td>
<td>14.3</td>
<td>19.7</td>
</tr>
<tr>
<td>East Asia and Pacific</td>
<td>4.5</td>
<td>4.8</td>
</tr>
<tr>
<td>Rest of World</td>
<td>1.5</td>
<td>2.0</td>
</tr>
</tbody>
</table>

**Source:** Eora database. Note: Latin America and Caribbean excludes Central America.

**Figure 2.7. Sources of Foreign Value Added in Exports (%)**

<table>
<thead>
<tr>
<th>Destination</th>
<th>2005</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>North America</td>
<td>41.3</td>
<td>38.3</td>
</tr>
<tr>
<td>Latin America and Caribbean</td>
<td>16.7</td>
<td>19.5</td>
</tr>
<tr>
<td>Europe and Central Asia</td>
<td>19.5</td>
<td>20.0</td>
</tr>
<tr>
<td>East Asia and Pacific</td>
<td>12.3</td>
<td>12.7</td>
</tr>
<tr>
<td>Middle East and North Africa</td>
<td>1.7</td>
<td>1.8</td>
</tr>
<tr>
<td>Sub-Saharan Africa</td>
<td>0.7</td>
<td>1.2</td>
</tr>
<tr>
<td>South Asia</td>
<td>0.6</td>
<td>1.0</td>
</tr>
</tbody>
</table>

**Source:** Eora database. Note: Latin America and Caribbean excludes Central America.

The share of DVA that is consumed abroad has remained stable between 2005 and 2015, suggesting that Central America’s domestic market increased in importance over the period. Industries that rely on final demand abroad experienced a decline in the share of DVA in foreign demand over total DVA. The share for the fishing and agriculture sectors decreased the most, from 56 to 49 percent for the former, and from 42 to 40 percent for the latter (Figure 2.8). Except for re-exports and re-imports, which account for a small portion of total DVA creation, the share of DVA created by foreign final demand has expanded only in private households during this period, as firms relied less on foreign demand.
2.3. Participation in Global Value Chains

A country’s ability to participate in GVCs depends as much on its capacity to import efficiently world-class inputs, technology, and know-how as on its capacity to export. Within a GVC, imports are essentially inputs into exports, thus countries cannot become major exporters without first becoming successful importers of intermediate inputs. A country’s level of participation can be assessed in part based on both its forward and backward integration. Forward integration refers to a country’s share of value added embodied in other countries’ exports, that is, domestically produced intermediates to be used in further stages of production of goods and services abroad, which are then exported as finished products or intermediates. Backward integration, or FVA (foreign value added), is the share of foreign value added embodied in a country’s exports, that is, intermediate inputs and services imported from other countries that are used to produce final goods or intermediates to be exported. A greater dependency on foreign inputs for domestic exports is a common trend in most economies over the past few decades, given the emergence of increasingly complex and fragmented international production networks.

Central America displays a low and shrinking use of foreign inputs in its exports, but trade liberalization could help reverse the trend. Relative to the rest of the world, Central America has a lower share of FVA in
exports but, surprisingly, South America and the rest of LAC have even lower shares (Figure 2.9). The foreign content of Central America’s exports decreased from 22 to 19 percent between 2005 and 2015, and the decrease in the use of foreign inputs is spread among almost all industries in Central America, except for re-exports that are a characteristic mainly of Panama (Figure 2.10). Interestingly, El Salvador and Panama’s foreign value content of exports are comparable to that of East Asia and Pacific (Figure 2.9). These high backward linkages can either be driven by: (i) size, as small countries are more dependent on imported inputs and foreign markets, or (ii) better connectivity to major GVC hubs, such as China and the European Union, which can positively impact both backward and forward GVC participation in manufacturing. The latter appears to be more relevant in explaining their performance given that these two countries have excellent air hubs, and in the case of Panama also ports. More generally for the sub-region as a whole, trade liberalization (tariffs and non-tariffs) and seamless border crossing can expand effective market size and promote participation in GVCs.16

Among the countries in the sub-region, Costa Rica, Nicaragua, and Guatemala are relatively more integrated through forward linkages. The DVA of Central American countries in third countries’ exports varies between 14 percent for Costa Rica and 8 percent for El Salvador and Honduras (Figure 2.11). Relative to the rest of the world, however, Central America’s results are not as strong as before, which may be due to the pre-eminence of unsophisticated final products in the sub-region’s export basket, as described before. Across comparators, only Mexico has lower forward linkages than the average for Central America, although this country exports sophisticated final products to the United States, such as cars. Forward linkages increased slightly over the last decade for most Central American countries, except Panama and El Salvador, but the sub-region still lags considerably in providing inputs to other countries’ exports compared with Europe and East Asia.
Figure 2.10. Foreign value-added content of exports by sectors, 2005–2015

- Re-export and Re-import: 2015: 73.9, 2005: 72.1
- Transport Equipment: 2015: 26.0, 2005: 25.0
- Metal Products: 2015: 22.9, 2005: 22.0
- Other Manufacturing: 2015: 18.6, 2005: 18.0
- Electrical and Machinery: 2015: 16.1, 2005: 15.5
- Wood and Paper: 2015: 15.7, 2005: 15.0
- Food and Beverages: 2015: 12.2, 2005: 11.6
- Recycling: 2015: 10.6, 2005: 10.0
- Public Administration: 2015: 6.1, 2005: 5.6
- Fishing: 2015: 5.1, 2005: 4.6
- Private Households: 2015: 4.6, 2005: 4.1
- Wholesale Trade: 2015: 4.1, 2005: 3.6
- Hotels and Restaurants: 2015: 3.6, 2005: 3.1
- Maintenance and Repair: 2015: 3.1, 2005: 2.6
- Others: 2015: 2.6, 2005: 2.1
- Mining and Quarrying: 2015: 2.1, 2005: 1.6
- Agriculture: 2015: 1.6, 2005: 1.1
- Electricity, Gas and Water: 2015: 1.1, 2005: 0.6
- Post and Telecommunications: 2015: 0.6, 2005: 0.1
- Education, Health and Other Services: 2015: 0.1, 2005: 0.0
- Retail Trade: 2015: 0.0, 2005: 0.0
- Financial Intermediation and Business Activities: 2015: 0.0, 2005: 0.0
- Total: 2015: 5.6, 2005: 5.1

Source: Eora database. Rest of LAC includes only the Caribbean and Belize.

Figure 2.11. Domestic Value Added in Third Country Exports: Forward Linkages (2005–2015)
Overall, Central America exhibits the second-lowest participation in GVCs among comparators. The GVC participation index combines the measures of forward and backward integration, indicating the extent to which a country participates in vertically integrated production (Koopman et al. 2010). Countries that rely intensively on imported inputs for their exports or export mostly to supply foreign exporters, or both, have higher values of GVC participation. As seen in Figure 2.12, Central America has the lowest GVC participation index among comparator regions after the Rest of LAC (the Caribbean and Belize). The decomposition of the GVC participation index into backward and forward linkages shows that among the comparator regions, Central America has the lowest participation in GVCs as a supplier of intermediate inputs and the third-lowest participation as a user of imported inputs for its exports. Regions that are more integrated into GVCs, such as Europe and Central Asia and East Asia and Pacific, have higher levels of both backward and forward linkages, indicating that they make use of both channels more than other regions with lower GVC participation.

**Figure 2.12. GVC Participation Index**

![GVC Participation Index](image)

Source: Eora database. Note: Rest of LAC includes only the Caribbean and Belize.

### 2.4. The role of FDI and Labor Mobility in GVCs

FDI is shown to be the main catalyst for developing countries’ participation into GVCs – to list a few, intel played a key role in Costa Rica, Samsung in Vietnam, and Renault-Nissan in Morocco. Through several channels, FDI helps developing countries connect to GVCs: (i) it brings the most needed scarce capital to developing countries to build their capacity and attract global producers; (ii) foreign firms provide more training to their local employees than local firms and transfer their technical skills to them through learning by doing and demonstration; (iii) foreign firms introduce local employees and producers to global markets helping them acquire new skills and expand their global networks; (iv) foreign investment provides a vote of confidence for the country that helps attract more global producers. Technology transfer from foreign firms to local firms, which is crucial for developing countries, takes place through labor market mobility, that is, when local employees move from foreign to local firms; as well as through collaboration between foreign firms and local buyers and suppliers.

Data suggests that Central America is attracting FDI in relatively good amounts, better than the average for LAC (4.9 percent compared to the LAC average of 4 percent in 2018). Consequently, the sub-region also has a higher level of participation in GVCs than LAC average (with a GVC index of 30 versus 24 for LAC). However, a closer look at the composition of FDI in the sub-region shows that the bulk of FDI goes to three countries: Panama, Costa Rica and Honduras, in that order. Panama and Costa Rica’s successful use of FDI to boost their economic
performance is well documented. However, their linkages to GVCs are weaker when compared to countries in the East Asia and Pacific region with similar FDI inflows. One explanation for this could be that Central America’s labor market mobility is low due to limited competition and regulatory distortions that weaken knowledge spillovers and lower productivity gains from FDI. Therefore, increasing labor market mobility not only within each Central American country, but also in the sub-region, given the small size of each economy, offers high potential to increase the sub-region’s productivity and competitiveness and its participation into GVCs.

**Box 2.1. The impact of Multinationals on domestic firms and workers**

FDI is long known for its multiple benefits to host countries, leading to competition among countries to attract more of it. Empirical evidence shows that multinational firms tend to be larger and more productive, Research & Development (R&D) intensive, and export-oriented than non-multinational firms.\(^1\) Another strand of the literature highlights that multinational firms are key to diversify exports, integrate into regional and global value chains and bring capital, technology and management skills.\(^2\) Through these channels, multinationals are expected to promote productivity and innovation in the host countries. Therefore, countries around the world compete to attract FDI using a wide range of fiscal incentives such as tax holidays, subsidized industrial infrastructure or the establishment of special economic zones.\(^3\) However, multinationals’ (MNC) impact on host countries’ productivity depends largely on how linked these companies are to the local economy.

**Using data for Costa Rica, research shows that interaction with multinational firms in the domestic market increases the size and productivity of domestic suppliers as well as the earnings of workers moving from domestic firms to multinationals.** To supply multinational corporations, domestic firms in Costa Rica improved their performance, expanded their workforce (by 26 percent) and gained 6 to 9 percent in standard measures of total factor productivity (TFP) four years after the multinationals began operations.\(^4\) Furthermore, the empirical evidence for Costa Rica shows that that MNCs’ expansions have a positive and significant impact on the wages of workers in domestic firms. This impact manifests through both the labor market and firm-level exposure of the worker to MNCs. In particular, the wages of workers who move from a domestic firm to a multinational increase 9 percent more on average than those of workers who move from one domestic firm to another (direct effect).\(^5\)

### 2.5. Positioning in GVCs

The position of a particular country in a GVC can be measured by its “distance to final demand” (Antràs, Chor, Fally, and Hillberry 2012), that is, the distance in terms of the number of production stages between the production of a good in a country and the final demand.\(^6\) Evidence suggests that only a few countries have managed to move downstream, as in, closer to the final demand. Most countries have increased their “upstreamness,” because the overall length of value chains has increased with the fragmentation of production. Moreover, the offshoring process that lengthens a GVC tends to affect more the early stages of production. A country’s ideal position in a GVC is not always clear, as it depends on the value chain in question. For some, most of the value is captured upstream, while for others, more value is downstream, and in some cases they are equal.

Central America’s exports are closer to final demand (more downstream) than those of other regions, which reflects the sub-region’s specialization in the exports of (mostly unsophisticated) final goods. Export upstreamness in Central America is the lowest among the comparators, along with Mexico, and significantly lower than in South America, where exports are dominated by minerals and agricultural products (Figure

---

3. Typically the creation of these special areas within countries offer different benefits to foreign firms. These benefits typically encompass taxation, trading, quotas, customs and labour regulations.
2.13). It is worth noting that among the Central American countries, export upstreamness has decreased the most in Nicaragua over the last decade, followed by Costa Rica and Panama, which reflects the increased importance of final goods in these countries’ export baskets.

**Figure 2.13. Export Upstreamness**

[Figure showing export upstreamness with data points for different regions and years, 2007 and 2017.]

Source: Eora database.

Central America’s import upstreamness is among the lowest globally, and it increased only slightly over the past decade. This indicates that the sub-region imports goods that are closer to final demand, which may explain the modest amount of value addition that takes place in Central American countries. Among these countries, El Salvador had the highest decrease in import upstreamness, followed by Costa Rica (Figure 2.14). East Asia and Pacific has the highest upstreamness among comparators due to the large domestic production of intermediate inputs in China, Malaysia, and Thailand, which allowed imports to switch to more upstream sectors.

**Figure 2.14. Import Upstreamness**

[Figure showing import upstreamness with data points for different regions and years, 2007 and 2017.]

Source: Eora database.
2.6. Conclusion and policy recommendations

As 70 percent of world trade takes place within international production networks, export competitiveness is increasingly dependent on the efficient sourcing of imported intermediate inputs and services, as well as the ability to attract and retain FDI. Central American exporters use fewer imported inputs than a decade ago. Although the reasons for this vary from country to country, this is likely due to a combination of the following factors: (i) high tariff or non-tariff barriers; (ii) cumbersome border crossing processes; and (iii) weak infrastructure and logistics. The sub-region is also attracting reasonable amounts of FDI, driven particularly by Panama – but FDI in Costa Rica and, surprisingly in Honduras, is also high as a share of GDP. However, the sub-region’s high share of FDI does not match with its low GVC participation, since regions with high FDI also tend to have high GVC participation. This could be due to the sub-region’s weak human and physical human capital capacity, broadly speaking, as well as distortions in its markets. Therefore, further reforms are needed to diversify exports, increase FDI and its linkages to the rest of the economy and strengthen integration into GVCs. Central American countries will benefit from adopting a two-pronged strategy:

1. Focus on reducing tariffs and non-tariff barriers especially those increasing production costs for domestic firms and negatively affecting their competitiveness in export markets. Likewise, a renewed focus on streamlining procedures in trade facilitation and improving connectivity in transport and logistics would help foster GVCs. Reducing trade barriers would enable potential GVC participants in Central America to compete better in the global market through importing high quality inputs to complement their own production. In addition, gains from reducing tariffs and non-tariff barriers are magnified when goods cross borders many times, as is often the case in international production networks. Stronger trade facilitation measures, such as simplified customs clearance and improved transport and logistics, are policy levers that governments can pull to deepen regional and global connectivity within value chains and facilitate firm upgrading. Better logistics and improved transportation and communications infrastructure can facilitate the operation of cross-border value chains and address one of the sub-region’s main disadvantages. In addition, Central American countries need to continue developing the absorptive capacity of local firms to link with foreign manufacturers and comply with the standards in foreign markets.

2. Further improve policies to attract and retain FDI in sectors beyond natural resources (e.g., agriculture and minerals). This will also help diversify exports by increasing participation in GVCs. Ideally FDI will flow to countries based on their comparative advantages, which has probably been the case already. However, as countries introduce seamless borders, i.e., integrate their markets for goods and services, excessive competition for FDI should be avoided. Simple but binding rules on FDI incentives will need to be introduced across the sub-region. Related to FDI, is labor mobility across countries, which has been good overall. As industries integrate, the sub-region might need to re-assess its policy to attract and allocate human capital talent to complement existing skills.
PROGRAMA DE EJECUCIÓN FÍSICO
3. Better Utilizing the Demographic Bonus in the Informal Economy*

The informal sector represents an underutilized labor endowment that could enable countries to accelerate growth. At 39 percent of GDP and 40 percent of employment in 2016, Central America’s informal output and employment are larger than that of the rest of LAC (32 and 34 percent, respectively) and well above that of advanced economies (18 and 16 percent, respectively). By most measurements, Costa Rica has the smallest and Guatemala, Nicaragua, and Honduras have the largest informal economies. Both informal output and employment in Central America have been decreasing during the past decade, though they are still high and thus limit the sub-region’s potential growth. As in most emerging markets, Central America’s informal sector has lower productivity than its formal sector, with the exception of Panama, where workers in the informal sector are, on average, as productive as their counterparts in the formal sector. In the other Central American countries, especially in Honduras and Nicaragua, labor productivity in the informal sector is much lower than in the formal sector, suggesting that policy interventions are needed to address the issue. This chapter runs a cross-sectional regression model with interaction terms to assess the determinants of informality in the six Central American countries. Results suggest that informality in Central America is associated with under-development and its related symptoms, including lack of human capital and poor trade openness. Thus, policies that aim at long-term development, such as scaling up basic education, targeted skills and vocational training, and providing SME and farm support programs, together with implementing the recommendations made in chapters 1 and 2 to deepen trade, will help unleash this potential source of growth. Burdensome regulations and corruption are positively correlated with informality in Central America, so improving the overall business environment is also required. Further improving human capital will help boost labor productivity in the informal sector.

3.1. Introduction

The informal sector is prominent in emerging markets and developing economies (EMDEs). In 2016, it accounted for about one-third of official GDP and 70 percent of total employment, more than half of which consisted of self-employment (World Bank 2019b). While the informal sector contracted in most EMDE regions between 1990 and 2016, including in the six Central American countries, the average share of GDP of informal output remained at around 45 percent, and the share of informal employment in total employment remained at 65 percent, two-thirds of which was self-employment (Figure 3.1).

The informal sector tends to lock physical and human capital in a less-productive sector, resulting in low productivity growth and untapped growth potential (Loayza 2018). Although the informal sector offers flexibility and employment opportunities in some economies (Maloney 2004), a large informal sector is associated with a range of adverse economic issues, including lack of development, low productivity, low wages, low-skill jobs, reduced tax revenues, and excessive regulatory burdens. A prominent informal sector also constrains the government’s ability to collect revenues and spend on growth-enhancing activities, which further dampens a country’s long-term growth potential (Loayza 1996).

* Authored by Shu Yu (Economist, EPGDR).
There are large potential gains from reducing the size of the informal sector through country-specific policies. This chapter will examine the informal economy in Central America, and then use this information to discuss some of the policy options that are available to address any issues. Chapter 3.2 uses descriptive statistics and a wide range of informality measures to show the patterns and evolution of informality over time in Central America. Chapter 3.3 applies regression methods to identify the main correlates of informality in the sub-region and the potential correlates of low productivity in the informal sector. Section 3.4 presents policy discussions.

### 3.2. Measuring the informal economy

Informality is often defined as market-based legal production of goods and services hidden from public authorities for monetary, regulatory, and institutional reasons (Schneider, Buehn, and Montenegro 2010). The classification of informality is deeply context-specific (World Bank 2019b): Some studies distinguish different types of informality by the motives for participating in the informal economy (as in, to be involuntarily “excluded” from the formal sector or to voluntarily “exit,” Perry et al. 2007). Others focus on “subsistence informality,” which captures low-skilled workers who would fall below subsistence levels in the absence of an informal economy (Docquier, Muller, and Naval 2017). Some others use the entities engaged in informal activity (as in, “intrafirm margin” and “intersectoral margins of firms and workers,” Maloney 2006; and “extensive” and “intensive” margins, Ulyssea 2018). The International Labor Organization (ILO) defines informal employment as all workers of the informal sector and informal workers outside the informal sector (ILO 2018). The most frequently used measure of informal employment is the share of self-employment in total employment, which largely overlaps with informal employment. For this report, the informal economy includes activities that, if recorded, would contribute to GDP, but does not include illegal or criminal activities or household production (Schneider, Buehn, and Montenegro 2010; Medina and Schneider 2018).

Given the difficulty in measuring informality, the literature has developed a wide range of estimation methods. For this report, the database of Elgin et al. (2019) is used to measure the informal economy, as it contains all commonly used measures of informality, ranging from model-based estimates of the share of informality in official GDP—MIMIC (Multiple Indicators and Multiple Causes MIMIC) and DGE (Dynamic General Equilibrium) estimates—to survey-based measures of the share of informality in total employment (share of self- and informally employed), to public perceptions of the extent of informality (World Economic Forum [WEF] index). The database includes up to 196 economies (36 advanced and 160 EMDEs) over the 1990–2016 period. Both cross-country rankings and time trends are consistent for most countries.

The productivity of the informal sector is measured as the ratio of informal labor productivity to total labor productivity (Loayza 2018). If the ratio is close to one, it implies that labor productivity in the informal and formal sectors is similar. If it is lower than one, it implies that labor productivity in the informal sector is lower than productivity in the formal sector. Identifying correlates of the relative productivity ratio will shed light on the factors associated with productivity in the informal sector.

### 3.3. Informality in Central America

The size of the informal sector in Central America is slightly larger than the LAC average and, as expected, also relative to advanced economies. In 2016, the informal sector in Central America accounted for, on average, about 40 percent of official GDP, while the average share of informal output in other countries in LAC was about 32 percent of official GDP, or 37 percent when MIMIC estimates are used, and around 18 percent in advanced economies (Figure 3.1). The average share of self-employment was around 40 percent of total employment in Central America in 2016, which is about 6 percentage points higher than in other countries in the region, and about 25 percentage points higher than in advanced economies.

There is heterogeneity in the size of the informal sector across countries in Central America. The informal sector is the smallest in Costa Rica, at 22 percent of official GDP and 23 percent of total employment (proxied...
by self-employment) in 2016. When measured in output, Panama has the second lowest informal sector, though it is nearly twice as large as Costa Rica’s. When measured in survey-based self-employment data (SEMP), Guatemala has the second lowest informal sector (at 30 percent of total employment), followed by Panama (at 33 percent). However, Guatemala’s informal sector is the largest in terms of output (46 percent of GDP) and in Nicaragua and Honduras in terms of informal employment measured through survey-based self-employment (56 and 55 percent, respectively).

**Informality has been contracting in Central America during the past few decades, following the trend in the LAC region.** The decline is greater in output than in self-employment (Figure 3.2). On average, the share of informal output in Central America has dropped from about 45 to 40 percent of GDP between early 1990s and 2016. The share of self-employment in Central America climbed to 46 percent of employment in 2002 (Argentina crisis) but has dropped to 37 percent on average during the 2013–2016 period, as in other LAC countries.

Between 1990 and 2016, Central America experienced a decline in the share of informal output but the share of informal employment rose in some countries (Figure 3.2). Focusing on DGE-based estimates, Panama and El Salvador are notable for the decline in informal output after relatively high informality in the beginning of the 1990s. During the period 1990–2016, the share of self-employment rose in Honduras and Nicaragua, remained stable in Panama and El Salvador, and declined in Costa Rica and Guatemala. The lack of a joint decline in informal output and informal employment in Panama and El Salvador implies that labor productivity declined more in the informal sector relative to the formal sector.

**Central America’s labor productivity in the informal sector is significantly lower than in the formal sector, but there are important country differences.** As shown in Figure 3.3A, the ratio of informal labor productivity over total labor productivity in Central America is significantly below one, and below the ratio in advanced economies, indicating relatively lower productivity in Central America’s informal sector. Among the six countries, Panama has the highest—close to one—suggesting workers in the informal sector are, on average, as productive as their counterparts in the formal sector. In other countries, especially in Honduras and Nicaragua, labor productivity in the informal sector is much lower than in the formal sector, suggesting that some informal workers or firms might not be productive enough to survive in the formal sector and there is room for policy interventions (section 4). The relatively lower labor productivity in the informal sector indicates that policy makers should consider placing greater emphases on policies aimed at boosting Central America’s long-term development and productivity.

A higher level of informality can be associated with poor fiscal indicators, after controlling for tax rates and bases. The level of informality in Central America, together with low tax rates and narrow bases, hinders the countries’ ability to collect tax revenue: tax revenue accounts for 19 percent of GDP in other EMDEs in LAC, it is only about 14 percent of GDP in Central America (Figure 3.3C). Efforts to design a tax collection system that reaches all taxpayers will be needed, along tax reforms that broaden tax bases and enhance the neutrality of the tax systems relative to individuals’ and a firms’ choice regarding formality/informality.

**Personal income tax revenues are much lower in Central America than in other EMDEs.** Personal income tax collected in Central American countries is, on average, about 1.5 percent of GDP, which is statistically and significantly lower (by 1 percentage point of GDP) than the average level in other EMDEs (Figure 3.3D). Although this is beyond the scope of this chapter, earlier work by the World Bank suggests that this is driven mainly by low and narrow rates, rather than informality. In Guatemala, for instance, the maximum marginal rate is only 7 percent of income. However, on average, the amount of corporate income tax collected does not differ significantly between Central America and other EMDEs, presumably also driven by a more even application of rates (in most countries, the marginal corporate income tax rate is 25 percent). Assuming that informality also plays a role in low tax collection, the above statistics suggest that tax avoidance in Central America’s informal sector is more likely to occur at the personal level rather than at the firm level.

**Women tend to work more in the informal sector in Central America than they do in the rest of LAC.** The data does show that a large part of female employment around the world takes place in the informal
For example, close to 79 percent of those working in the informal in Guatemala are women. Similarly, in Costa Rica, women working in the informal sector as a share of employment is 40 percent.

**Facilitating access to education and access to the labor market can boost growth.** In a background paper for this section, Sinha (2019b) applies the occupational choice model developed by Hsieh *et al.* (2019) to study how reducing barriers in labor markets and in human capital accumulation faced by women can facilitate female labor force participation and accelerate growth in Central America (Box 3.1). The results show that removing these barriers faced by women can have a large effect on aggregate output and female labor force participation in the analyzed countries.

**Box 3.1. Unleashing female participation in Central America**

In a background paper for this report, Sinha (2019b) applies the occupational choice model developed by Hsieh *et al.* (2019) to study how reducing barriers in labor markets and in human capital accumulation faced by women can accelerate growth in Central America. Barriers in the labor market appear in the model as a wedge that breaks the identity between occupational wages and marginal products. The stylized specification captures the many taste-based and statistical discrimination (Altonji and Blank, 1999). Barriers in human capital accumulation arise as higher relative education costs and envelop a menu of factors such as favorable treatment received by men from parents and teachers, formal and informal restrictions on women entering schools and training programs etc. In addition to the two barriers, the occupational choices between men and women can deviate due to differences in preferences and social norms (Costa, 2000; Blau *et al.*, 2013).

The model yields a rich set of estimates on barriers faced by women between 1985 and 2015 in three Central American countries: Costa Rica, Panama and El Salvador. Considering the joint effect of the two barriers reveals that the changes over time have benefitted women in most occupations in each of the three Central American economies. The barriers affecting human capital accumulation have gone down more generally across occupations in each of the three countries. Changes in labor markets are less encouraging, with only El Salvador showing overall improvement. Moreover, labor market barriers have risen in the education-intensive occupations (managerial, professional and technical) in Costa Rica and Panama. These findings highlight the need for reforms that correct for barriers arising post educational attainment in the job market.

Finally, the author finds that removing barriers in labor markets and in human capital accumulation faced by women have a large effect on aggregate output which differs considerably across countries. Conservative estimates suggest that market output in Costa Rica and El Salvador expands by 15 and 20 percent respectively, and results in Panama are even larger. Additionally, female labor force participation increases by more than 20 percentage points in all three countries.

**Figure I: Counterfactual change in Female labor force participation**

<table>
<thead>
<tr>
<th></th>
<th>Counterfactual changes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Barriers</td>
</tr>
<tr>
<td></td>
<td>Labor market (1)</td>
</tr>
<tr>
<td></td>
<td>Human capital accumulation (2)</td>
</tr>
<tr>
<td></td>
<td>Both (3)</td>
</tr>
<tr>
<td><strong>Panel A: Women</strong></td>
<td></td>
</tr>
<tr>
<td>Costa Rica</td>
<td>24.9</td>
</tr>
<tr>
<td></td>
<td>16.8</td>
</tr>
<tr>
<td></td>
<td>31.0</td>
</tr>
<tr>
<td>El Salvador</td>
<td>12.3</td>
</tr>
<tr>
<td></td>
<td>11.4</td>
</tr>
<tr>
<td></td>
<td>20.5</td>
</tr>
<tr>
<td>Panama</td>
<td>25.7</td>
</tr>
<tr>
<td></td>
<td>18.0</td>
</tr>
<tr>
<td></td>
<td>29.3</td>
</tr>
</tbody>
</table>

*Source: Sinha (2020b) Note: The table shows the counterfactual change in female labor force participation when each distortion is lifted individually (columns 1 and 2), and jointly (column 3).*

---

*VI World in Data: [https://ourworldindata.org/female-labor-force-participation-key-facts](https://ourworldindata.org/female-labor-force-participation-key-facts)

*VII These were the only countries where harmonization of panel data was possible. For more details on data harmonization, please refer to the appendix in Sinha (2020b).*
Figure 3.1. Informality in Central America

A. Informal output

- DGE (CA)
- MIMIC (CA)
- DGE (LAC excl. CA)
- MIMIC (LAC excl. CA)

B. Informal employment

- SEMP (survey-based, CA)
- SEMP (model-based, ILO, CA)
- SEMP (survey-based, LAC excl. CA)
- SEMP (model-based, ILO, LAC excl. CA)

C. Informal output across countries

- CRI
- PAN
- GTM
- HND
- NIC
- SLV

D. Informal employment across countries

- CRI
- PAN
- GTM
- HND
- NIC
- SLV

Source: Elgin et al. (2019), ILO, WEF, World Bank (2019). Notes: EMDEs: Emerging markets and developing economies. AEs: Advanced economies. LAC: Latin America and Caribbean region (all EMDEs). CA: Central America (6 EMDEs). DGE (MIMIC): DGE-based (MIMIC-based) estimates on informal output as percent of official GDP. SEMP: share of self-employment in total employment to proxy for informal employment. WEF: WEF index on people’s perception of the extent of informality (high numbers refer to more informality). Data are from the latest year available, which is 2016 for DGE, MIMIC, model-based SEMP estimates, and WEF. Simple average informal output and employment of other regions in 2016 are as follows. Output (DGE): ECA 34 and EAP 26 percent; Employment (SEMP): ECA 30 and EAP 40 percent.

Figure 3.2. Evolution of informality in Central America

A. Informal output over time

- DGE (CA)
- MIMIC (CA)
- DGE (LAC excl. CA)
- MIMIC (LAC excl. CA)

B. Informal employment over time

- SEMP (survey, CA)
- SEMP (model, CA)
- SEMP (survey, LAC excl. CA)
- SEMP (model, LAC excl. CA)

C. Evolution of informal output across countries

- CRI
- PAN
- GTM
- HND
- NIC
- SLV

D. Evolution of informal employment across countries

- CRI
- PAN
- GTM
- HND
- NIC
- SLV

Source: Elgin et al. (2019), ILO, World Bank (2019). Notes: DGE = DGE (dynamic general equilibrium)-based estimates on informal output in percent of official GDP. SEMP = self-employment in percent of total employment. LAC = Latin America and Caribbean region (all EMDEs). CA = Central America (6 EMDEs). Data are between 1990 and 2016. A.-B. Lines show simple averages of each country group. C.-D. Bars show simple averages of each sample period for each country in Central America. DGE estimates are used for informal output in C, while survey-based self-employment shares (SEMP, survey) are used for informal employment in D.
Two major reasons for informality emerge from existing theoretical models: lack of development and poor governance, including burdensome regulations, corruption, and poor public services. Informality has often been attributed to underdevelopment, as it reflects the inability of an urban formal sector to absorb rural migrants during the urbanization process (Harris and Todaro 1970; Loayza 2016). Limited access to credit, also related to underdevelopment, is shown as another factor preventing informal firms from moving to the formal sector (Capasso and Jappelli 2013). Poor governance, higher taxation, and heavy-handed regulation have also been shown to increase firms’ incentives to avoid interaction with the state by remaining informal (Ihrig and Moe 2004; Choi and Thum 2005; Amaral and Quintin 2006; Dabla-Norris et al. 2018; Ulyssea 2018). Excessive labor regulations encourage informal employment by increasing the cost of formal employment (Rauch 1991; Loayza 2016).

Theoretically, a sizeable informal sector could impede growth, encourage poor governance, and limit a government’s ability to raise revenues. A sizeable informal sector that competes with the formal sector for low-skilled workers reduces the incentives to invest in human and physical capital and new technologies and slows growth in the long run (Docquier, Müller, and Naval 2017; Loayza 1996; Sarte 2000). Several theoretical models attribute corruption and excessive regulations to the presence of an informal economy. Government officials are incentivized to impose excessive regulations and permits to increase their power for collecting bribes in return for providing permits (Shleifer and Vishny 1993).
3.4. Empirical results

Consistent with the theoretical models and World Bank (2019), four economic factors are included in the analyses of the correlates of informality: level of development, years of schooling, access to credit, and trade openness. A list of institutional factors is considered, including ease of doing business; business and economic freedom from Freedom House; and government effectiveness, control of corruption, and rule of law from Worldwide Governance Indicators (WGI). Here, higher values of institutional measures imply better governance, less regulatory burden, and more ease of doing business. Both groups of correlates are included in cross-sectional regression models. Interaction terms between correlates of informality and a regional dummy for Central America are further added to show whether the relationship between each correlate and informality differs between Central American countries and non-Central American countries.

A lower level of development, measured as per capita income, is associated significantly with higher informality (Figure 3.4). Per capita income is related negatively to both output and employment informality, while it is related positively to the relative ratio of informal labor productivity to total labor productivity. This suggests that as the economy develops, informality decreases, while relative informal labor productivity increases. The relationship between informality and per capita income does not differ between Central American countries and non-Central American countries, implying that underdevelopment is an important factor in Central America’s high level of informality (Figure 3.5).

A larger and less productive informal economy is associated significantly with a lower level of human capital. At the firm level, informality can limit access to conventional bank credit, due to a lack of documentation for assets and adequate financial statements, which in turn limits investment in physical and human capital. Investment activity in the informal sector may also be suppressed because informal firms may be unwilling to adopt technologies that would make them more visible to tax and other authorities, thereby resulting in lower productivity. The relationship between informality and per capita income does not differ between Central American countries and non-Central American countries, implying that underdevelopment is an important factor in Central America’s high level of informality (Figure 3.5).

In Central American countries, human capital stands out in its significant negative association with informal employment (Figure 3.5). The connection between informal employment and years of schooling remains significant for countries in Central America (as well as the connection between labor productivity in the informal sector and years of schooling). The results suggest that in Central America, improving human capital may help boost labor productivity in the informal sector.

A smaller and more productive informal sector is associated typically with greater trade openness (Figure 3.4). However, empirical studies show that the impact of major trade liberalization episodes on informality varies across countries and between short- and long-term analyses. When looking only at Central American countries, there is a significantly positive link between informal output and trade openness, which suggests that trade liberalization could be associated with the expansion in informality. However, there is no significant association between trade openness and informal employment (Figure 3.5).

Heavier regulatory burdens may encourage informality, as workers and firms join the informal sector to avoid regulatory (or administrative) compliance costs. The Doing Business distance-to-frontier scores are associated negatively with levels of informality, but linked positively with labor productivity in the informal sector. Similarly, indexes of economic and business freedom are connected negatively with the extent of informality, but connected positively with informal labor productivity. Both results suggest the importance of alleviating regulatory burdens for improving productivity in the informal sector. The linkages between informality (and informal labor productivity) and regulatory burdens also apply to both Central American and non-Central American countries (Figure 3.5). Additional productivity gains could be achieved in the informal sector by improving the business climate and removing burdensome, redundant regulations.
Past studies have shown the significant contribution of poor governance to informality in some EMDEs (Loayza, Oviedo and Serven 2006, Dreher and Schneider 2010). By adding costs for working or operating in the formal sector, poor governance reduces workers’ and firms’ incentives to interact with the state. For instance, a high level of corruption essentially implies more bribery and greater rent-seeking in the formal sector, resulting in workers and firms moving to the informal sector to avoid such costs (Shleifer and Vishney 1993; Choi and Thum 2005; Dutta, Kar, and Roy 2013). As an example, it is estimated that 75 percent of the difference in labor informality between Peru and Chile is due to causes related to poor governance (Loayza and Wada 2010).

Significant negative associations are found between the extent of informality, both in terms of output and employment, and the three governance indicators under consideration: government effectiveness, control of corruption, and rule of law (Figure 3.4). In contrast, better governance indicators are shown to be connected positively with the ratio of productivity in informal sector to total labor productivity (Amin, Ohnsorge, and Okou 2019). The positive association between governance and the relative ratio of productivity suggests that improved
governance is linked with a narrowing productivity gap between formal and informal firms. This may further imply that improved government effectiveness lowers the entry barriers to the formal sector for informal firms, increasing their linkages with formal firms and knowledge spillovers between them (De Soto 1989; Loayza 2018).

The negative association between governance and the level of informality is observed in both Central American countries and non-Central American countries in LAC (Figure 3.5). In terms of informal output, the negative association between control of corruption and the level of informal output is stronger in Central America than in the rest of LAC. Since corruption is more severe in Central America than in other countries in LAC, the results suggest that reducing corruption might relate to a stronger reduction in informal output in Central America. The same theory applies to rule of law. In addition, government effectiveness in Central America is found to be connected positively with higher labor productivity in the informal sector.

**Figure 3.5. Correlates of informality in Central America**

**A. Economic correlates of informal output**

<table>
<thead>
<tr>
<th>Coefficient</th>
<th>Non-CA</th>
<th>CA</th>
<th>Non-CA</th>
<th>CA</th>
<th>Non-CA</th>
<th>CA</th>
<th>Non-CA</th>
<th>CA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ln(GDP pc)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yrs of schooling</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Access to credit (10)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trade openness</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**B. Institutional correlates of informal output**

<table>
<thead>
<tr>
<th>Coefficient</th>
<th>Non-CA</th>
<th>CA</th>
<th>Non-CA</th>
<th>CA</th>
<th>Non-CA</th>
<th>CA</th>
<th>Non-CA</th>
<th>CA</th>
</tr>
</thead>
<tbody>
<tr>
<td>DB (*10)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BF (*10)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EF (*10)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gov Eff</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Corrupt</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rule of law</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**C. Economic correlates of informal employment**

<table>
<thead>
<tr>
<th>Coefficient</th>
<th>Non-CA</th>
<th>CA</th>
<th>Non-CA</th>
<th>CA</th>
<th>Non-CA</th>
<th>CA</th>
<th>Non-CA</th>
<th>CA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ln(GDP pc)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yrs of schooling</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Access to credit (10)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trade openness</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**D. Institutional correlates of informal employment**

<table>
<thead>
<tr>
<th>Coefficient</th>
<th>Non-CA</th>
<th>CA</th>
<th>Non-CA</th>
<th>CA</th>
<th>Non-CA</th>
<th>CA</th>
<th>Non-CA</th>
<th>CA</th>
</tr>
</thead>
<tbody>
<tr>
<td>DB (*10)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BF (*10)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EF (*10)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gov Eff</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Corrupt</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rule of law</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**E. Economic correlates of informal productivity (ratio)**

<table>
<thead>
<tr>
<th>Coefficient</th>
<th>Non-CA</th>
<th>CA</th>
<th>Non-CA</th>
<th>CA</th>
<th>Non-CA</th>
<th>CA</th>
<th>Non-CA</th>
<th>CA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ln(GDP pc)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yrs of schooling</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Access to credit (10)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trade openness</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**F. Institutional correlates of informal productivity (ratio)**

<table>
<thead>
<tr>
<th>Coefficient</th>
<th>Non-CA</th>
<th>CA</th>
<th>Non-CA</th>
<th>CA</th>
<th>Non-CA</th>
<th>CA</th>
<th>Non-CA</th>
<th>CA</th>
</tr>
</thead>
<tbody>
<tr>
<td>DB (*10)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BF (*10)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EF (*10)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gov Eff</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Corrupt</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rule of law</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: The same as in Figure 3.4.

Notes: All bars show the coefficients from estimating the following cross-section regressions: $y_i = \alpha + \beta_1 x_i + \beta_2 C_{i, \text{CA}} + \beta_3 \text{Reg}_i + \epsilon$ where $y_i$ is the average informal output (DGE)/employment (SEMP)/productivity ratio over the period 1990–2016 in country i, $x_i$ is the variable of interest averaged over the period 1990–2016 in country i, Central America is a dummy that equals to 1 if country i is in Central America and 0 otherwise, and Reg is a set of regional dummies. The coefficients before $x_i$ are shown in blue for countries out of Central America, while $\beta_1 + \beta_2$ are shown in red for countries in Central America. Whiskers show the 90 percent confidence intervals. “Access to credit” is measured as “domestic credit to private sector in percent of GDP”. “Trade openness” is proxied by “the sum of imports and exports in percent of GDP”. Most of the regression results remain when GDP per capita is controlled in the cross-section regressions.
3.5. Relevant international and Central American experiences

This chapter summarizes the economic and institutional interventions that have been linked to a smaller but more productive informal sector, including fiscal policies, business climate governance, and other measures that aim at long-term growth and productivity. In the case of Central America, a comprehensive policy mix that aims at long-term development while lowering entry barriers to the formal sector and boosting productivity in the informal sector should be considered. Policies should be tailored carefully to country circumstances, as causes and types of informality may vary across countries.

Many EMDEs have experimented with policy reforms to cope with the informal sector, from improving access to credit to simplifying tax systems (Figure 3.6A). In countries like Panama, Costa Rica, and Guatemala, several reforms have been implemented to remove tax and regulatory burdens and improve the ease of getting credit (Figure 3.6B). Past experience suggests that policies aimed at streamlining tax regulations and lowering tax burdens can be associated with lower informality.33 Removing regulatory burdens and improving governance are also linked with lower informality and improved conditions in the informal sector. Finally, increasing labor market regulations can facilitate the transition of workers and firms from the informal sector to the formal sector (Loayza 2018).

To tap the unexploited growth potential of the informal sector, Central America needs a comprehensive development strategy that is tailored carefully to country circumstances and the specifics of the informal sector in the sub-region. Policy interventions in isolation may have a limited impact on informality and can have unintended consequences (Ulyssea 2018; World Bank 2019b). For instance, trade liberalizations in Brazil, Colombia, and Egypt were found to be associated with greater informality in the short run, unless they were accompanied by measures to improve labor market flexibility (Goldberg and Pavcnik 2003; Attanasio, Goldberg, and Pavcnik 2004; Selwaness and Zaki 2015; Bosch, Goni, and Maloney 2007).34 The informal sector in Central America is associated with low labor productivity and poor fiscal outcomes. Improving both governance and the provision of public education could incentivize firms (and enable workers) to join the formal sector and boost their productivity.

3.5.1. Fiscal policies

Tax and spending policies can induce informality, and at the same time a sizeable informal sector undermines a country’s ability to collect taxes or provide basic services. While establishing a causal relation between taxation and informality for Central America was beyond the scope of this report, it is useful to summarize international experience with tax policy reforms that avoid creating a vicious cycle between taxation and informality:
Tax compliance can be encouraged by simplifying tax codes, improving tax enforcement (such as through the use of Information and Communications Technology—ICT), building the capacity of tax administrations, harmonizing tax regulations, limiting the use of cash transactions, and encouraging the use of bank-based tax payments (Ulyssea 2018; Awasthi and Engelschalk 2018). The ability to collect personal income tax in Guatemala is particularly low, suggesting that these types of measures could make large improvements (Figure 3.7).

Tax simplification can reduce the tax burden for formal firms through tax relief for new employees or simplifying tax bases in industries with a high percentage of undeclared workers. Past empirical studies show that tax simplification and tax cuts were associated with lower informality in India, Russia, Georgia, and Brazil—in the form of increased formal firm registration (India, Georgia), income reporting (Brazil, Russia), and share of formal employment (Brazil, Russia).35

Value added taxation (VAT) can help strengthen tax collection even in the presence of a sizable informal sector, as it can serve implicitly as an input tax (de Paula and Scheinkman 2010). In countries like Panama and Guatemala, the relatively low level of VAT suggests that an increase may offer potential for improvement (Figure 3.7). Costa Rica is also showing a low tax turnover collection in this figure, but in 2018 the government enacted a reform to transform the turnover tax into a proper VAT, and significantly broadened its base in the process. During the six months prior to the COVID-19 Pandemic, this reform was bearing significant fruits.

Tax morale, generally defined as voluntary compliance with tax laws and creating a social norm of compliance, can be encouraged to increase tax compliance and reduce informality (Luttmer and Singha 2014; Sung, Awasthi, and Lee 2017).36

On the spending side, improving the provision of public goods and services, such as through strengthening education or infrastructure, could help improve productivity in both formal and informal sectors. Furthermore, reforms to social security systems could reduce the incentives to hire informal workers while at the same time providing a better safety net for informal workers (Oviedo, Thomas, and Karakurum-Ozdemir 2009; Truman et al. 2019).

**Figure 3.7. Fiscal policies in Central America**

![Fiscal policies in Central America](image)

Source: Elgin et al. (2019); World Bank (2019); IMF, WoRLD. Notes: LAC= Latin America and Caribbean region (all EMDEs). CA= Central America (6 EMDEs). A-B. Bars (lines) show simple averages for each country (each country group) over the period 2013–2016.

### 3.5.2. Business climate and governance measures

Reducing regulatory burdens. In Central America, the level of ease of doing business is similar to the level in other EMDEs but remains lower than in advanced economies (Figure 3.8). This suggests that productivity gains in the informal sector or a higher level of formality could be achieved by further reducing regulatory costs. Reducing either labor or firm regulatory costs may help incentivize workers or firms to move to the formal sector (Bruhn 2011, 2013). For workers, policy changes such as providing incentives for worker registration and improved enforcement of existing labor laws may encourage them to move to the formal sector (Anand and Khera
2016; Munkacsi and Saxegaard 2017). To encourage firms to enter the formal sector, governments can create a “one-stop-shop” or online “single window” registration to simplify the process (as was done in Honduras in 2010). Training and business services can help firms benefit from their newly obtained formal status (Campos, Goldstein, and McKenzie 2018).37

More effective governance. Countries in Central America have poorer governance relative to other EMDEs in LAC (Figure 3.8). As shown in Figure 3.4 and Figure 3.5, higher government effectiveness is linked with lower informality and improved informal labor productivity in Central America. The finding is in line with existing studies showing that poor governance, such as corruption and the absence of rule of law is associated positively with informality in EMDEs.38

3.5.3. Measures on boosting long-term growth and improving productivity

Improving education. Countries in Central America are lagging behind the rest of the region in terms of educational attainment, especially Guatemala, Honduras, and Nicaragua. This implies that potential productivity gains and reductions in informality can be achieved by building human capital (Figure 3.8). Workers may be trapped in the informal sector due to lack of the human capital and skills needed in the formal sector (Perry et al. 2007). Higher quality and more accessible public education may help increase labor productivity in the informal sector and move workers to better paid formal employment (Loayza 2018; Docquier, Muller, and Naval 2017).

Figure 3.8. Governance and business climate in Central America

A. Institutional conditions across EMDEs

B. Government effectiveness across countries in Central America

C. Years of schooling across countries in Central America

D. Years of schooling in Central America and comparator country groupings.

Source: World Bank, WDI, Doing Business, WGI; Barro and Lee (2013); Freedom House. Notes: LAC= Latin America and Caribbean region (all EMDEs). CA= Central America (6 EMDEs). DB= Doing Business. BF= Business Freedom (Freedom House). EF= Economic Freedom (Freedom House). A-B. Bars show the simple averages for each country group from the latest year available. C-D. Data are from the latest year available. Lines show simple averages for each country group.

Increasing access to credit. Firms in the informal sector have limited access to credit from the banking sector and capital markets, which restricts their ability to make investments and enhance productivity (Capasso and Jappelli 2013). While Central America has made progress in access to credit during the past few decades (Figure 3.8), further improvement in access to the banking system and digital payment systems can provide an entry point to the formal financial system and encourage a shift away from informal finance.
**Leveraging new technologies.** Governments should take advantage of new technologies to lower regulatory burdens, improve productivity, and motivate firms and workers to join the formal sector. In particular, new technologies can be used to strengthen tax administration, broaden tax collection, and improve access to credit (Gupta et al. 2017; Awasthi and Engelschalk 2018). Digitalization can lower regulatory burdens and operating costs in the formal sector. For example, Costa Rica reduced the time required to register a business by digitizing tax registration records and company books in 2009 (Doing Business 2009). This was followed by a drop in the share of informal employment by 4 percentage points of total employment and a fall in the share of informal output by about 2 percentage points of official GDP over the 2009–16 period.

### 3.6. Conclusion

**Informality is more pervasive in Central America relative to other developing countries in LAC.** Despite the recent decline in informality, the informal sector in Central America is linked with low labor productivity and poor fiscal outcomes: informal labor productivity is significantly lower than formal labor productivity and informality is associated particularly with low (personal income) tax revenues.

A comprehensive policy package designed for long-term growth and tailored to country-specific circumstances should be implemented in Central America to unleash the growth potential in the informal sector and improve the quality of jobs. More years of schooling, lower regulatory costs, and improved governance are linked with less informality and improved labor productivity in the informal sector in Central America.
4. Managing Volatility from Trade and Financial Flows*

The United States is the biggest trading partner of Central American countries and the major source of their remittances. About 90 percent of remittances to El Salvador, Guatemala, and Honduras, and 50 percent of remittances to Nicaragua originated from the United States in 2017. The sub-region's dependence on the United States in trade and remittances makes it vulnerable to the shocks in the United States economy—not least of which is the impact of COVID-19 on the unemployment rate of the Latino population in the United States. This chapter estimates the effect of economic uncertainty in the United States on the remittances, exports, and output of Central American economies. Using monthly data during 2005–2018 and the VAR model, the analysis found that Central American countries are impacted negatively by economic uncertainty in the United States. A one-standard-deviation of uncertainty shock to the United States economy is associated with a decline in the United States industrial output of 0.5–0.8 percent during the 10–14 months following the shock. In Central America, economic output is estimated to decline by 0.2–1.0 percent during the 2–20 months after the shock, depending on the country and the transmission channels considered. Countries with stronger trade relationships with the United States such as Costa Rica and Panama, as well as El Salvador and Honduras, are most affected by the shock. The remittances channel is stronger than or as important as the trade channel for Guatemala, Honduras, Nicaragua, and El Salvador. The estimates show a decrease of up to one percent in remittances for Guatemala, Nicaragua, and El Salvador. However, for Honduras, the impact on remittances is positive. One explanation could be that these uncertainty shocks also increase the perceived heightened risk of deportation for Honduran migrants, which in turn increases their remittances. Honduras and Guatemala have seen substantial increases in remittances during the last two years, coinciding with various uncertainties in the United States. These results suggest that Central American countries will need to build external fiscal and financial buffers to address volatility and seek to insure themselves against negative shocks from the United States when cost-effective, using both multilateral (flexible credit arrangements) and market instruments.

4.1. Introduction

Concerns about the impact of uncertainty in Central America increased after the 2009/2010 global financial crisis and the recent crisis precipitated by the COVID-19 pandemic. The global economy generated what were thought as the most uncertain moments in recent history. But COVID-19 has generated an even higher level of uncertainty: oil prices have dropped to levels unimaginable a while ago, the Chinese economy suffered a major shock, and debt levels are increasing. Such high levels of uncertainty affect financial markets and increase volatility. Although the exact impact of uncertainty on economic activity is not simple to measure, there is strong theoretical and empirical evidence that it is countercyclical, indicating that it is associated with a reduction in real economic activity (Fajgelbaum, Schaal, and Taschereau-Dumouchel 2017; Decker and D’Erasmo 2016; Bachmann and Moscarini 2011).

Given the current period of heightened uncertainty, this chapter explores the impact of uncertainty on trade, remittances, and economic activity in Central American economies, which are closely connected to the world through trade and remittances, among other channels. The results can provide a scale of the potential impacts as well as the possible transmission mechanisms of uncertainty shocks originating outside

* Written by Natalia Leonor Campora (Consultant, ELCMU), drawing on the Internal World Bank Report entitled “Exploring Impacts of External Uncertainty on Central America (P165256)”.
Central America (Figure 4.1, Figure 4.2, and Figure 4.3). They can also be used to inform policy makers about the unexpected consequences of some decisions.

**Central American countries are closely linked to the United States’ economy through trade and remittances.** As mentioned earlier, the United States’ share of Central American exports ranges between 30 and 77 percent, and its share of imports ranges between 20 percent and 43 percent (Figure 4.2). Besides trade, remittances from the United States are essential for the economies of Nicaragua, Guatemala, El Salvador, and Honduras (the “C4”), representing 10 to 20 percent of their GDPs (Figure 4.3).

**Figure 4.1. Trade of Central American countries (% of GDP)**

```
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Guatemala</td>
<td>60</td>
<td>80</td>
<td>100</td>
</tr>
<tr>
<td>El Salvador</td>
<td>40</td>
<td>60</td>
<td>80</td>
</tr>
<tr>
<td>Costa Rica</td>
<td>20</td>
<td>40</td>
<td>60</td>
</tr>
<tr>
<td>Nicaragua</td>
<td>10</td>
<td>20</td>
<td>30</td>
</tr>
<tr>
<td>Honduras</td>
<td>5</td>
<td>10</td>
<td>15</td>
</tr>
<tr>
<td>Panama</td>
<td>2</td>
<td>4</td>
<td>6</td>
</tr>
</tbody>
</table>
```

Source: WDI.

**Figure 4.2. U.S. share in C6 exports and imports (% of GDP) Average of 2004–2018**

```
<table>
<thead>
<tr>
<th>Country</th>
<th>Exports to the US</th>
<th>Imports from the US</th>
</tr>
</thead>
<tbody>
<tr>
<td>Guatemala</td>
<td>80%</td>
<td>60%</td>
</tr>
<tr>
<td>Nicaragua</td>
<td>70%</td>
<td>50%</td>
</tr>
<tr>
<td>Costa Rica</td>
<td>60%</td>
<td>40%</td>
</tr>
<tr>
<td>El Salvador</td>
<td>50%</td>
<td>30%</td>
</tr>
<tr>
<td>Honduras</td>
<td>40%</td>
<td>20%</td>
</tr>
</tbody>
</table>
```

Source: WDI. Note: Panama is not included in Figure 4.3 as its remittances are low, at 0.86 percent of GDP in 2017, skewing the results.

Given the strong economic linkages of Central American countries with the United States, they could be impacted negatively by the recent reduction in industrial production resulting from uncertainty shocks, as put forward by Baker, Bloom, and Davis (2016). This chapter focuses on production, export, and remittance channels to analyze how uncertainty shocks in the United States’ economy can impact economic activity in each of the six Central American countries. The results obtained from the vector autoregression (VAR) model reveal that increased economic uncertainty is followed by a decline in economic activity in the Central American economies, and that trade and remittances are likely to be the major transmission channels. The magnitude and persistence of the effect varies across countries.

**In line with previous research, this chapter explores the relationship between economic uncertainty in the United States and Central American economies, with an emphasis on remittances for the C4.** Several papers have studied long-term trends and factors affecting remittance inflows in Latin America (Vargas-Silva and Huang 2006; Roache and Gradzka 2007; Ruiz and Vargas-Silva 2010) and other regions of the world (Ratha 2003), showing that remittance inflows mirror the economies where the migrant workers are located. The impact of remittances may depend how they covary with economic activity in the receiving country. If remittances
Remittances play a crucial role in the Central American region, as they represent a significant share of households’ income and allow countries to import inputs and technology. In addition, they have allowed communities in some Central American countries avoid extreme poverty and economic hardship after natural disasters. As discussed in Borja (2012), the rise in remittances to Central American countries reflects the structural transformation experienced by these economies, as they moved from exporting garments and commodities to exporting labor to the United States. On the other hand, high levels of remittances may appreciate exchange rates, reducing the competitiveness of the countries’ exports and preventing the development of their manufacturing sectors (Amuedo-Dorantes and Pozo 2004). This negative effect may translate into lower investment, lower income, and increased poverty.

This chapter builds on a previous World Bank internal study that suggests that the increased level of uncertainty in today’s global economy appears to be having negative effects on the economic performance of Central American countries. The study concludes that uncertainty in the United States has an impact on Central American economies via direct and indirect transmission channels and presents empirical support to an indirect transmission channel through United States’ economic activity and trade. Complementing this previous study, this chapter focuses on the role of remittances as an additional transmission channel of economic uncertainty in the United States to C4 countries. Therefore, the VAR models are reformulated to show the effects of remittances on the six Central American countries’ economic performance as well as on the other variables.

**Box 4.1. Related Literature Using VAR**

Extensive research uses VAR models to investigate the impact of uncertainty on macroeconomic indicators and economic activities (e.g., Alexopoulos and Cohen 2009; Bloom 2009; Baker et al. (2016); Caggiano et al. 2013; Leduc and Liu 2013; and Nodari 2014). These papers have typically followed a within-the-United States country approach: they have focused on the reaction of a set of United States’ variables to a shock to the level of uncertainty affecting the United States economy itself. However, shocks hitting a leading economy such as the United States may very well spill over to other countries. Kim (2001), Favero and Giavazzi (2008), and Mumtaz, and Theodoridis (2012) estimate spillover effects regarding financial markets. For example, Colombo (2013) investigates the effects of a United States economic policy uncertainty shock on some Euro-area macroeconomic aggregates via structural VARs. Carrière-Swallow and Céspedes (2013) study the impact of uncertainty shocks in emerging countries, while Cerda, Silva, and Valente (2018), measure the impact in a small open economy, Chile.

**4.2. Methodology**

Two indicators are used to proxy uncertainty. The first, the volatility index, or VIX, measures market expectations of near-term volatility in Standard & Poor’s 500 stock index option prices. The data are available from the Chicago Board Options Exchange (CBOE) webpage. The second, the United States Economic Policy Uncertainty (EPU) index is created from three components: (i) newspaper coverage of policy-related economic uncertainty; (ii) number of federal tax code provisions set to expire in future years; and (iii) disagreement among economic forecasters. The VIX and the EPU index often move together, with a correlation of 0.42 (Figure 4.4).

Following Baker, Bloom, and Davis (2016), structural VAR models are used to assess the effect of economic uncertainty in the United States on six Central American countries (Box 4.1 presents related literature). Drawing on the literature, it is assumed that uncertainty shocks in the United States are transmitted to Central American countries through changes in economic activities in the United States, the United States’ demand for the exports of Central American countries, and remittances from the United States to Central America. Economic activities, exports, and remittances are measured using the monthly indicators produced by
the National Statistical Offices of each country, from January 2005 to 2019. The model is estimated separately for each Central American country and displays the orthogonalized impulse-response functions (IRF) for economic activity, exports, and remittances following a shock to uncertainty of one standard deviation (Box 4.2 presents details of methodology).

**Figure 4.4. Monthly U.S. EPU Index and the VIX monthly average (average of daily values for 30 days)**

The first step is to assess the effects of uncertainty on each country. The number of lagged values to be included in each equation is determined following the specifications in Baker, Bloom, and Davis (2016). Log levels of variables are used in the estimations, instead of differences, as in cases where variables are co-integrated, a VAR in differences may be incorrectly specified, as it may not capture part of the long-run dynamics of the variables.

To explore the channels through which uncertainty could impact Central American countries, several VAR models are estimated for each country. Uncertainty can impact countries both directly and indirectly through a range of transmission channels, such as exports, remittances, and United States’ economic performance. The basic VAR model includes only two variables: the measure of uncertainty (VIX and EPU) and the economic activity indicator (EAI) of the country of interest. This basic model shows that increased uncertainty tends to be followed by reduced economic activity in C4 countries, but it does not shed light on the importance of the direct and indirect channels discussed above. In addition, omitting the United States’ economic performance could lead to miscalculations. To address this issue, alternative specifications of the model are estimated with a measure of United States’ economic activity (the U.S United States’ Industrial Production Index), and the exports and the remittances of C6 countries under consideration. The IRFs of these models provide support to an indirect transmission channel through United States’ economic activity, remittances, and trade. Figure 4.5 presents the order of the first-round shocks for the main model used for the analysis, as well as the feedback loops allowing for interactions among all variables.

Following the Cholesky decomposition method, it is assumed that shocks hitting Central America do not have contemporaneous effects on United States variables. Results for two models are presented depending on the country under study. The first model is for Costa Rica and Panama, where only exports are included in the model, as monthly data is not available for remittances (which are trivial for these countries). The second model is for the C4, where both exports and remittances are included in the model as the transmission channels of uncertainty.

First a bi-variate VAR in which uncertainty impacts the economic performance of each C6 country is estimated, and then more variables are added to the model. This allows the analysis of the dynamic nature
of the relationship between different variables, making the model robust to several specifications. In addition, only the estimated IRFs of the most relevant model are reported for each country and only results of the model using VIX are presented, since the EPU index gives similar results. Box 4.3 shows the results of uncertainties generated by the COVID-19 pandemic on remittances.

Figure 4.5. Direct and indirect impact of an increase in uncertainty in the U.S. on the economic performance of C6

Box 4.2. Econometric Analysis and Building the Model

VAR models are estimated using monthly data for each country separately. VAR models extend the univariate autoregression to multiple time series variables and allow the user to estimate the dynamic responses to an exogenous impulse. They consist of a set of $n$ time series regressions, of which each variable's linear model is explained by its own lagged values of all $t$ series. In a VAR model with two time-series variables, $y_t$ and $z_t$, there are two equations with lagged values of both variables in both equations. The reduced form VAR is specified as:

$$
y_t = \delta_0 + \alpha_1 y_{t-1} + \gamma_1 z_{t-1} + \alpha_2 y_{t-2} + \gamma_2 z_{t-2} + \mu_t,
$$

$$
z_t = \phi_0 + \beta_1 y_{t-1} + \rho_1 z_{t-1} + \beta_2 y_{t-2} + \rho_2 z_{t-2} + \epsilon_t,
$$

where the coefficients are unknown and $\mu_t$ and $\epsilon_t$ are error terms, which are the shocks in the variables after considering its past values. If the different variables are correlated with each other, the error terms in the reduced form model will also be correlated across equations. To estimate VAR coefficients with uncorrelated error terms for each regression equation (called “recursive VAR”), the Cholesky decomposition is employed. The results using this method depend on the order of the variables, showing which variable is assumed to impact which, and in which order. Therefore, the order of the variables in the VAR system is a critical choice. To test for robustness, we assume, for example, that United States' economic performance tends to impact C6 economic performance rather than the other way around, although we perform robustness checks to rule out reverse causation.

Given the dynamic interactions between the variables, the direct interpretation of VAR models is difficult. By computing IRFs, VAR models show the effect over time of the structural shocks on the variables of one of the VAR errors. IRFs simulate the response of current and future values of each variable in the system to a one-unit increase in the current value of the variables, assuming this error returns to zero in subsequent periods and that all other errors are equal to zero.

---

VIII Key concepts based on Neusser (2016); Stock and Watson (2001); and Stock and Watson (2015).

IX For more details see Neusser (2016).
In the model, dynamic responses after an impulse such as a VIX shock (increase in uncertainty) are estimated. As in Baker, Bloom, and Davis (2016), the variables in levels (log) are used instead of differences, since a VAR in differences may be incorrectly specified if some variables are co-integrated, as that does not capture part of the long-run dynamics of the variables. However, running the model in logs may imply that the variables are not covariance stationary, so it is important to test to ensure the specification does satisfy this condition.

The number of lags to be included in each equation is determined following the specifications in Baker, Bloom, and Davis (2016). The models estimate the impact of a one standard deviation shock to the uncertainty indicator (monthly VIX). The first round of shocks can have: (i) a direct impact on C6 economic performance (measured by monthly EAIs); and (ii) an indirect impact on C6 economic performance through United States’ economic performance, C6 exports, and C6 remittances. The model is dynamic in nature; therefore, it allows for feedback loops in which each variable can impact other variables. Although drawing causal inferences from VARs is tremendously challenging, VARs are useful for describing dynamic relationships.

**Box 4.3 Impact of COVID-19 on Remittances**

COVID-19 and the policies implemented to contain it have led to a worldwide collapse in economic activity, which most likely resulted in significant wage and employment losses for migrant workers. As a result, remittances are expected to decline significantly as well, reducing an important source of income for Central American countries. Data on remittances for the last few months is not currently available, precluding a direct quantitative assessment of the effect of COVID-19 on remittances. However, the models discussed in this study can shed light on this issue. Specifically, using available United States industrial production data to calibrate the size of the negative shock to economic activity in the United States, impulse-response functions can be used to obtain the model-implied decline in remittances. Figure 17 in Annex 2 shows the impact over time of a 15 percent negative shock to United States industrial production, the observed decline between February and April of 2020. Increasing the size of the shock to 15 percent.

According to the IRFs, a 15 percent negative shock to United States. Industrial Production Index leads to a drop in remittances of up to 22 percent in Guatemala, 34 percent in Honduras, 14 percent in Nicaragua, and 12 percent in El Salvador (Figure 18 in Annex 2). However, there are some caveats about the numbers presented. First, the confidence intervals are wide, therefore, these numbers are imprecisely estimated. Second, COVID-19 represents an unprecedented shock to economic activity, and thereby, the implemented measures as well as its impacts are unusual. The VAR model is a simulate-based-forecasting method, which uses variables past performances to predict the impact of certain shocks, but COVID-19 is certainly a unique kind of shock. In fact, the COVID-19 shock has impacted stronger on the services sector, while in the past recessions where associated with larger impact on the manufactures sector.

**4.3. Results**

Uncertainty shock impacts the United States’ economic performance negatively for the first ten months, which is expected to affect the C6 countries through at least three channels: (i) remittances; (ii) trade demand; and (iii) financial flows. Detailed calculations and context by country are included in Annex 2 and can be summarized as follows:

- **In Costa Rica** most important transmission channel of uncertainty from the United States is trade. A shock to economic uncertainty reduces Costa Rican monthly economic activity by around 0.4 percent during the first 18 months and reduces exports up to 1 percent for around 5–20 months after the shock.

- **El Salvador** is linked to the United States’ economy through both international trade and remittances. The simulations confirm that both trade and remittances are transmission channels of an external uncertainty shock. Exports, remittances, and economic activity substantially decrease after the VIX shock: remittances go down 0.8 percent and this impact remains for about 4–30 months, as well as a
decline in economic activity of up to 0.4 percent. The impact on exports lasts for a shorter duration but is still significant (around 18–20 months) and is up to 1 percent.

- **Guatemala** is linked to the United States’ economy mainly through international trade and remittances. The simulations suggest remittances are a stronger transmission channel for Guatemala than trade. A shock to United States’ uncertainty of one standard deviation: (i) reduces the remittances to Guatemala up to 1 percent 8-30 months after the shock; (ii) increases exports moderately, after a short period of decrease; and (iii) reduces economic activity up to 0.2 percent during the first 20 months after the shock to uncertainty in the United States.

- **Honduras** is also linked to the United States economy through trade and remittances. A shock to United States uncertainty of one standard deviation: (i) increases the remittances to Honduras up to 2 percent 15-32 months after the shock; (ii) reduces the exports of Honduras up to 1 percent around 10 months after the shock; and (iii) reduces Honduran monthly economic activity up to 0.5 percent 5-20 months after the shock.

- **Nicaragua** is also linked to the United States economy mainly through international trade and remittances. The simulations suggest remittances are a stronger transmission channel for Nicaragua than trade. A shock to United States uncertainty causes an immediate reduction in remittances, exports, and economic activity in Nicaragua. However, the impact on exports is moderate and does not last more than three to four months after the shock. On the contrary, the drop in remittances is up to 1 percent and the impact on economic activity is up to 0.8 percent, and both last around ten to fifteen months.

- **Panama** is linked to the United States economy mainly through international trade, especially exports. An uncertainty shock to the United States has a statistically significant effect on Panamanian exports for around 15 months, with a drop of up to 1 percent. The impact on economic activity is less significant, lasting a few months, and amounting to up to 0.25 percent.

### 4.4. Conclusion

This chapter analyzed the impact of an uncertainty shock in the United States’ economy on the remittances, exports and output of Central American countries. This analysis using monthly data from 2005 to 2018 and VAR model show that Central American countries are impacted negatively by uncertainty in the United States. Specifically, a one-standard-deviation shock via the VIX, measuring market expectations of near-term volatility, is associated with a decline in the negatively industrial output of 0.5–0.8 percent in the 10–14 months after the shock. Economic output is estimated to decline by 0.2–1.0 percent in Central America between 2–20 months after the shock, depending on the country and the transmission channels considered.

**Countries with strong trade relationships with the United States are most susceptible to uncertainty impacts.** Costa Rican and Panamanian exports are especially vulnerable to the uncertainty in the United States, as well as the exports of El Salvador and Honduras. Guatemala and Nicaragua do not appear to be strongly impacted through the export channel.

**The remittances transmission mechanisms tend to be stronger than or as important as the trade channel for Guatemala, Honduras, Nicaragua, and El Salvador.** The results of the analyses show a negative impact of an uncertainty shock on the remittances of Guatemala, Nicaragua, and El Salvador up to one percent. However, Honduras’s remittances increase up to 2 percent for around 15 months. Further analysis may be needed to understand why the remittances to Honduras increased as a response to the uncertainty shock in the United States, unlike the other three C4 countries, which recorded a decrease. One explanation could be that these uncertainty shocks also increase the perceived heightened risk of deportation of Honduran migrants, which in...
turn increases their remittances. Honduras has seen substantial increases in its remittances during the last two years, together with Guatemala, coinciding with various uncertainties in the United States.

**Overall, results suggest that an increase in uncertainty in the United States’ economy has an impact on economic activity in Central American countries, largely through remittance and trade channels.** The IRFs show that a shock to the United States’ uncertainty has a negative impact on its economic activity and on Central America’s remittances, exports, and economic activity—although in different degrees, depending on the country.

**Managing uncertainty and volatility requires first and foremost the ability to run countercyclical fiscal policies, ideally by building fiscal, external and financial buffers.** The COVID-19 pandemic found most Central American countries with enough external and financial buffers, but the fiscal situation in countries like Costa Rica and El Salvador, and most recently Nicaragua has eroded steadily over the past few years and is unlikely to provide headroom for a proper countercyclical policy. When feasible and cost effective, countries could also seek to insure themselves against these risks, including through flexible credit line offered by multilaterals.
5. Enhancing the Role of Remittances in Consumption Smoothing and Productive Investment*

Remittance inflows to Central America surged from less than US$80 million in 1980 to over US$24 billion in 2019 and about 80 percent of these remittances originated from the United States. Although the impact of remittances on poverty and inequality in Central America has been well documented, their impact on productivity is not clear cut. Remittances can promote productivity by reducing poverty and increasing investment, entrepreneurship and human capital, among others. However, they can also distort labor markets—by creating remittance dependence, increasing reserve wages and promoting brain drain—and reduce competitiveness of the recipient country by causing Dutch-disease. In Central America, remittances seem to have promoted growth by decreasing poverty, increasing consumption, access to education and health. However, productivity in Central America has been stagnating despite a surge in the sub-region’s remittance inflows in recent decades. Among the factors contributing to the weak linkages between remittances and productive investment are the high share of rural households and informal workers among remittance beneficiaries, who tend to have lower education than the population average and limited access to finance and entrepreneurial skills. Furthermore, shallow financial markets, weak infrastructure, high crime and violence, weak rule of law and control of corruption are likely to increase the risk of investment for remittances recipients. Country level reforms tackling these issues as well as developing institutionalized programs to channel migrant remittances to productive investments are likely to increase the remittances-productivity linkage, as well as the sub-regional reforms put forward in the previous chapters. Given that the recipients of remittances are predominantly women, programs to support women entrepreneurs would also increase the productive uses of remittances. Also, reducing the time and cost of money transfers, and broadening the base of intermediaries might encourage savings and, thus, investments.

5.1. Introduction

Remittances are a major source of financial flows to EMDEs. They exceed total inflows of official development assistance and private capital, including FDI (World Bank 2019a). In 2019, remittance inflows to EMDEs stood at over US$560 billion, with LAC accounting for 17 percent of the EMDE total (Figure 5.1A). Many EMDEs rely heavily on remittances for foreign exchange and for several EMDEs, including economies in Central America, this reliance has increased substantially since 2000 (Figure 5.1B). Therefore, the economic crisis triggered by the rapid spread of the COVID-19 virus poses a challenge for those economies, because of its acutely adverse impact on labor migration and incomes of migrant workers. In 2020, remittance receipts are estimated to collapse across all EMDE regions (including by over 19 percent in LAC)—the first broad-based reduction in remittances since the Asian financial crisis in 1997. The governments of EMDEs must put forth more efforts to ensure that remittances are directed to productive activities that help sustain productivity growth (World Bank 2020a).

* Authored by Sergiy Kasyanenko (Economist, EPGDR) and Hulya Ulku (Senior Economist, ELCDR).
Outward migration and remittances are a structural feature of many EMDEs in LAC, particularly for those in Central America and the Caribbean (Beaton et al. 2017). Natural disasters, past armed conflicts and political instability, persistent poverty, high levels of income inequality, and other challenging socioeconomic and security conditions drive the substantial outward migration flows from Central America. From 1980 to 2017, the Central American immigrant population in the United States increased by nearly ten times, to over 3.5 million people. As a result, remittance receipts in Central America surged from less than US$80 million in 1980 to over US$24 billion in 2019 (Figure 5.1C). In Honduras, El Salvador, Nicaragua, and Guatemala, remittances as a percent of GDP stood at around 22 percent, 21 percent, 13 percent, and 13 percent, respectively—well above the median for LAC or EMDEs, that stood at around 2 percent of GDP. Moreover, over the past two decades, these four Central American economies have experienced a large increase in remittance inflows as a percentage of GDP. For example, the ratio of remittances to GDP has more than tripled in Guatemala and Nicaragua since 2000 (Figure 5.2A).

The United States is the source of 90 percent of remittances to El Salvador, Honduras, and Guatemala. Nicaragua, in contrast, received a significant share of remittances from within the region: in 2017, nearly 40 percent of all remittance inflows to Nicaragua came from Costa Rica, and just over half originated in the United States. On that count, Nicaragua stands out as one of the LAC economies (with Haiti and Bolivia) where remittance inflows from within the region represent a nontrivial share of total remittances received (Figure 5.2B).

**Figure 5.1. Remittances in EMDEs and LAC**

A. Composition of remittances to EMDEs

B. Remittances in EMDEs: 2000 vs. 2019, % of GDP

C. Remittance receipts in Central America, US$ billion

**Figure 5.2. Remittances in EMDEs and LAC, % of GDP**

A. Remittances in LAC: 2000 vs. 2019

B. Sources of remittances in LAC


**Labor productivity growth in LAC has been consistently lagging the EMDE average and was at about a third of the OECD average in 2019 (Figure 5.3A).** Indeed, during 2012–2019, productivity in LAC grew by less than 1 percent a year on average, compared to 1.6 percent for all EMDEs. Excluding Middle East and North Africa, LAC experienced the slowest improvement in labor productivity after the global financial crisis compared to other EMDE regions. There is, however, substantial variation in productivity growth within LAC, with several economies managing to achieve annual productivity growth above 2 percent, on average, during 2000–2019 (Figure 5.3B). Still, EMDEs in Central America remain laggards in productivity growth, both compared to other LAC economies and EMDEs as a whole. Average annual labor productivity growth in El Salvador, Guatemala, Honduras, and Nicaragua over the 2000–2019 period stood at only 0.65 percent, 0.36 percent, 1.1 percent, and 1.1 percent, respectively. In addition, over the past two decades, productivity growth in these economies has been slower than many other regional peers. As a result, unlike many other EMDEs, productivity levels in Central America did not improve much over the past two decades relative to high-income countries (Figure 5.4A). For example, compared to 2000, relative productivity levels in Guatemala, El Salvador, Nicaragua, and Honduras in 2019 were about the same or lower relative to the OECD average, at 22 percent of the OECD level in Guatemala, 20 percent in El Salvador, 14 percent in Nicaragua, and 12 percent in Honduras (Figure 5.4B). Contrary to this, labor productivity was at 58 percent of the OECD average in Panama in 2019 (up from 35 percent in 2000), at 35 percent in China in 2019 (up from 8 percent in 2000), 22 percent in India (up from 9 percent), and 85 percent in Turkey (up from 60 percent).

**Figure 5.3. Labor productivity in EMDEs vs. LAC**

A. Productivity growth in EMDEs (percent)

B. Productivity growth in LAC (percent)

Source: World Bank. Note: Productivity refers to GDP per person employed in constant 2011 PPP $.
5.2. Relationship between remittances and productivity in EMDEs and LAC

Remittance inflows can provide a range of benefits to recipient economies, but they may also pose challenges. Remittances can promote economic development by reducing poverty and inequality, financing investments in education and infrastructure, and strengthening fiscal revenue, trade and investment networks, among others. They may, however, also retard economic development. For example, substantial inflows of remittances, like other private capital inflows, may cause currency appreciation and undermine the competitiveness of recipient countries. Remittances may also reduce the labor supply in recipient households by raising reserved wage rates or encouraging informal employment by providing a safety net for workers who lack access to formal social protections, such as unemployment insurance and sick leave. Large-scale labor migration may also impede economic and productivity growth by depleting the human capital of the country of origin, as outflows tend to consist of working-age people who may be more productive and better educated than the rest of the labor force (IMF 2017; ILO 2015). In many EMDEs, the expansion of the labor force, rather than improvements in labor productivity, is a major driver of economic growth. As a result, outward migration may impact productivity growth negatively, as it reduces the size of the labor force and increases labor costs.

Evidence does not provide a clear-cut relationship between remittances and productivity at the aggregate level. There is a strong association between migration and economic wellbeing—the data show that people tend to migrate from economies with lower GDP per capita, both for the sample as a whole and for the LAC region (Figure 5.5A and B). However, the relationship between labor productivity growth and remittances is less clear. Both for the full sample of EMDEs and, to a lesser extent, for LAC, a higher level of remittance inflows as a percentage of GDP tends to be associated with slower productivity growth (Figure 5.5C and D) but this correlation is weak and not statistically significant.

The weak association between productivity and remittances may be driven in part by the level of economic and financial development, quality of the business environment, and country-specific structural and policy weaknesses. More developed EMDEs with better institutions and more mature financial systems appear to be able to earn better growth dividends from remittances, while economic development outcomes may be less strong in EMDEs with higher remittances. For example, a study of remittances to a group of Central European economies, which tend to have better institutions, friendlier business regulations, and more developed financial markets compared to other EMDEs, found that remittances may have a similar impact on economic growth as other private capital inflows, such as FDI (Comes et al. 2018). Consequently, policy actions encouraging remittances (like measures targeting FDI inflows) may help channel remittances to more productive uses.
Despite a weak relationship between remittances and productivity, in many EMDEs, remittances are an important source of economic growth. There are positive spillovers from remittances to economic and productivity growth. They include the reduction of poverty and inequality, stronger social safety nets in recipient countries (which often have high levels of poverty and lack adequate social protections due to pervasive informal employment), increased investment in human capital (through higher spending by recipient households on education and healthcare), financial sector development, improved financial inclusion, and funding of entrepreneurial activities and small firms. However, without complementary structural reforms, such as business-friendly regulations and strong rule of law, many EMDE recipients of large inflows of remittances may not capture fully the potential impact of these inflows on long-term economic growth. In fact, economic growth in many EMDEs that receive sizable remittances is often supported by an increase in consumption driven by remittances; however, the impact of remittances on investment remains weak (Lim and Simmons 2015).

Remittance inflows are more stable and less sensitive to cyclical fluctuations than private capital flows, contributing significantly to national savings. Private capital flows, including FDI, are more sensitive to global business cycles as well as sudden shifts in investor confidence, often caused by the unfavorable political events common in Central America. As a result, remittances can be a reliable source of national savings and can greatly expand the pool of financial resources for investment projects. Furthermore, remittances may alleviate credit constraints and lower the cost of capital in many recipient EMDEs with insufficient access to bank loans due to the lack of developed local financial sector or high levels of informality (Bettin, Presbitero, and Spatafora 2017; Md et al. 2015). Therefore, when they are received by households in less-developed rural areas and by credit-constrained entrepreneurs in financially less developed EMDEs, remittances, tend to be positively associated with capital accumulation, private sector activity and investment.

**Figure 5.5. Migration vs GDP per capita and remittances vs labor productivity in EMDEs and LAC**

Source: IMF, World Bank. Note: Productivity refers to GDP per person employed in constant 2011 PPP $. Solid red lines indicate medians for EMDEs (LAC, panel B).
However, at the aggregate level, the relationship between remittances and investment is not strong. EMDEs with a higher share of gross fixed capital investment in GDP tend to achieve faster labor productivity growth (Figure 5.6A). However, for the full sample of EMDEs, the association between remittance inflows and investment is insignificant, though for the sample of LAC EMDEs there is a weak positive relationship (Figure 5.6B and C). Empirical studies find a modest contribution of remittances to investment and growth in LAC (World Bank 2006). This reflects considerable heterogeneity in migration and remittance patterns across the region, which leads to differences in expenditure and savings behavior of remittance recipient households. For example, remittances are positively associated with higher savings and investment rates and entrepreneurship; however, the strength of this association varies substantially across economies and depends on the socioeconomic characteristics of recipient households. Furthermore, the effect of remittances on productivity may not be easily detectable because the key channels involved—such as human capital accumulation, increased spending on healthcare, and poverty reduction—only impact growth over very long time periods (IMF 2005).

Figure 5.6. Remittances, investment, and labor productivity in EMDEs and LAC

Note: Productivity refers to GDP per person employed in constant 2011 PPP $; Investment refers to gross fixed capital formation as a percentage of GDP; Economic Freedom Index: higher value indicates more freedom; CPI (panels E, F) refers to Corruption Perception Index.

Enhancing the role of remittances in consumption smoothing and productive investment

Substantial inefficiencies in the public sector, weak rule of law, and high levels of corruption are major obstacles for sustained gains in productivity for EMDEs in Central America (Figure 5.6D and F). In particular, corruption and weak protection of property rights may discourage recipient households from using remittances to invest in physical capital. To make the most productive use of remittances, the governments of EMDEs that receive large amounts of remittances need to implement complementary reforms that strengthen public governance, reduce corruption, enhance competition and innovation, encourage participation in regional and global supply chains, improve the quality of education, reduce labor market inefficiencies and the size of informal employment, and boost public infrastructure investment.

5.3. Relationship between remittances and productivity in Central America

Guatemala, El Salvador, Nicaragua, and Honduras are small, low-growth economies with high poverty rates, weak institutions, high levels of corruption, and substantial exposure to political and natural disaster risks. Many workers are self-employed, and most jobs are low-skilled and informal, particularly in less-productive subsistence farming. Meanwhile, remittances represent a substantial share of the total income of remittance recipient households. In 2019, they amounted to US$620 per capita in Guatemala, US$873 in El Salvador, US$551 in Honduras, and US$255 in Nicaragua—well above the US$153 LAC or US$87 EMDE averages. A recent surge in remittances after the global financial crisis can be associated with falling unemployment rates among the Hispanic population in the United States and less uncertainty surrounding some of the immigration policies regarding the Temporary Protected Status (TPS) designations for El Salvador, Honduras, and Nicaragua.

However, despite sizable inflows of remittances, labor productivity in Central America remains well below the LAC and OECD averages. Labor productivity is about one-fifth of the OECD level in Guatemala and El Salvador, and less than 15 percent in Honduras and Nicaragua. Furthermore, productivity levels in Guatemala and El Salvador are about 60 percent of the LAC average, and less than 40 percent of the LAC average in Nicaragua and Honduras. Meanwhile, Panama and Costa Rica experienced much faster productivity growth over the past two decades relative to the LAC average, even though their remittances are below 1 percent of GDP. Thus, although remittances in Central America are associated with better welfare outcomes (such as lower inequality and poverty) and more spending on education, healthcare and housing investment, especially for poorer households, there is still scant evidence of substantial positive spillovers from remittances to productivity growth (Box I presents country level results). Higher prevalence of rural (except Honduras) and informal employment and remittance beneficiaries that are less educated than population average, combined with limited access to finance and entrepreneurial opportunities, are among the factors leading to underutilization of remittances in entrepreneurial activities in northern Central America. Furthermore, structural weaknesses such as political instability, crime, extortion, weak rule of law, corruption, often do not create a favorable environment for investing remittances in productive economic activities, as the recipients perceive credit and investment risky. For example, in Guatemala and Honduras extortion is one of the reasons remittance recipients keep a low profile and do not invest in businesses as they are more targeted for extortion.

Remittances tend to be used mostly for personal consumption expenditure. In fact, the weak association between long-term development and remittance inflows may, to some extent, resemble a result from the studies of the economic impact of foreign aid. Remittances are usually intended to serve as social insurance to help recipient families finance basic consumption needs, rather than investment spending. Empirical findings on the impact of remittance flows on productivity and long-term growth are often inconclusive and not very robust to alternative specifications. Furthermore, while large remittance inflows can boost short-term economic growth by supporting private consumption and alleviating poverty, abundant remittances may also create dependency and pose a moral hazard, as they reduce the incentives to enact structural reforms, which would enable channeling remittances into productive uses. A surge in remittance inflows may also worsen institutional quality in recipient countries by weakening public governance and encouraging corruption.
Box 5.1. Remittances and productivity linkages: country level findings

El Salvador. In 2019, remittances constituted 21 percent of El Salvador’s GDP, up from 15 percent in 2000. Remittances were going to one in five Salvadorans, primarily from over a million Salvadorans residing in the United States. Since nearly 80 percent of all remittance recipient households are poor or at risk of falling into poverty, remittances help reduce poverty and inequality, smooth consumption and attain better educational outcomes, including a much lower likelihood of children from remittance receiving households never enrolling in or leaving school. They also support financial inclusion and ease credit constraints. Ninety four percent of remittance recipients spend their remittances on consumption and 19 percent also spend on education, health, and savings. Although surge in remittances coincide with higher capital formation (Figure A19 in the Annex), they are less frequently used for income generating productive investment. Low rate of entrepreneurship among the beneficiaries of remittances is partly due to the fact that the beneficiaries often reside in poorer and less developed rural areas, work in informal sector and have lower education than non-recipients. The probability of being a microentrepreneur among remittance beneficiaries is the same as that of non-recipients. However, remittance beneficiaries are less likely to be salaried workers and more likely to be students, homemakers, business owners and unpaid homeworkers. Higher barriers to entrepreneurship, such as limited access to additional financial and lack of know-how on entrepreneurship given the profile of the beneficiaries mentioned above, as well as lack of institutional support and guidance to remittance recipients or senders, lead to underutilization of remittances in productive areas.

Guatemala. Remittance inflows to Guatemala increased from less than 3.5 percent of GDP in 2000 to over 13 percent of GDP in 2019, constituting ten times the level of net FDI inflows in 2018 (Figure A20 in the Annex). About one in seven Guatemalans reside abroad, sending remittances to one in ten Guatemalans. These remittances constitute 44 percent of remittance recipient households’ income. Remittances promote growth in Guatemala by boosting private consumption, reducing poverty, and providing funding for external financing needs. Fifty three percent of remittance recipient households is poor and 35 percent is vulnerable. Despite a substantial increase in remittances during the last two decades, productivity remains below LAC average and the share of gross fixed capital investment in GDP has been decreasing over the past decade— at 12 percent of GDP in 2018 it is one of the lowest in the LAC region (Figure 20C in the Annex). Several factors affect the productive uses of remittances in Guatemala. Although households receiving international remittances spend 58 percent more on education and housing than the rest, most remittances are still spent on daily consumption. Moreover, incidence of micro entrepreneurship among beneficiaries is the same as the population average. However, beneficiaries are less likely to be salaried workers and more likely to be students, homemakers, economically inactive and looking for a job. They are also more likely to live and work in rural areas and have lower level of education.

---

2. Cáceres and Saca 2006; Cox-Edwards and Ureta 2003. Children in household receiving remittances are less likely never enrolling in or leaving school than other children.
3. Anzoategui et al. 2014.
5. Wainer 2012.
6. Keller and Rouse 2016a. Share of microentrepreneurs among working age group of remittance beneficiaries (at 16 percent) is equal to population average, while the share of salaried workers is 13 percentage point lower than the population average. Four percent of these 13 percent of beneficiaries are students; 4 percent are homemakers, 1 percent each are business owners and unpaid homeworkers and other activities (2). Beneficiaries are also more likely to be women (70 percent), live in rural areas (47 versus 37 percent); work in agriculture (30 vs 22 percent) and in informal sector (78 vs 68 percent); own their house (61 vs 53), have lower education (4.8 years vs 6.8 years).
8. Keller and Rouse 2016b: Remittances recipients in Guatemala: A socioeconomic profile. About one in seven Guatemalans reside abroad, and for one in ten households in Guatemala, remittances represent nearly half of their income (IADB 2016).
10. ICEFI 2018.
11. Share of poor and vulnerable population in total population is 58 and 29 percent, respectively.
12. In 2000–2019, productivity grew on average by only 0.4 percent a year, compared to 0.6 percent for LAC and 1.1 percent for the OECD (Figure 19B in the appendix).
14. Keller and Rouse 2016b. At 13 percent, share of microentrepreneurs among remittance receiving households is the same as that of general population, while the salaried workers (at 24 percent) is 14 percentage point below that of general population. This difference comprised of students (4 percent), economically inactive (6), homemaker (3) and looking for a job (1).
**Honduras.** At 22 percent of GDP in 2019, remittance inflows to Honduras were more than three times higher than in 2000 and are well above the net FDI inflows of about 6 percent of GDP (Figure A21 in the Annex). Recent strong growth in remittances has been fueling robust economic growth, supported by private consumption. Remittance beneficiaries are more likely to be women, microentrepreneurs, students and homemakers, to live in urban areas and to work in services, while less likely to be salaried workers than the population average. During 2000-2019, Honduras’ labor productivity grew at nearly twice the pace of LAC. This occurred despite the sharp decline after the global financial crisis (Figure 5.3B), which is largely attributed to substantial drop in private investment triggered by the reversal of capital flows and the 2009 constitutional crisis (Figure 21C). Therefore, Honduras’s productivity remains at only around 12 percent of the OECD average (Figure 5.4B).

**Nicaragua.** Nicaragua relies on within-LAC labor migration and remittances more than other Central American EMDEs. Remittance flows to Nicaragua represented 13 percent of GDP in 2019, up from 6 percent of GDP in 2000. Unlike, private capital flows, which fell sharply amid heightened political uncertainty in 2018, remittances remain a more stable and growing source of external financing (Figure A22 in the Annex). Almost 40 percent of all remittances received in Nicaragua originate in Costa Rica. A third of households in Nicaragua receive remittances, with most of the remittances used to finance household expenditures, such as food consumption and utilities. Productivity in Nicaragua is growing faster than other Central American EMDEs, reaching 40 percent of the LAC average versus about a third in 2000, but it is still less than 15 percent of the OECD productivity levels (Figure 22B in the Annex). Higher investment spending, partly due to high FDI inflows, was an important driver of an increase in productivity. However, the recent upsurge in political uncertainty and violence triggered a drop in sectors such as tourism and construction. FDI as a share of GDP fell to its lowest level in almost two decades and gross fixed capital investment dropped from over 30 percent on average in 2011–13 to 23 percent in 2018 (Figure 22C). Furthermore, the fact that Nicaragua is one of the poorest countries in LAC, with 30 percent of employment in rural areas with low financial inclusion and savings rates, may limit the potential of remittances to accelerate productivity. Indeed, remittance receiving households are significantly less likely to have a savings account or loans from a financial institution. Therefore, the economic impact of remittances in Nicaragua is largely through informal and agriculture sectors, which, combined with lack of structural reforms and a strategic approach on remittances, limit the impact of remittances on productivity.

---

**Notes:**

XXIV Keller and Rouse 2016c: One in six Hondurans benefit from remittances, and 83 percent of all remittance recipient households are poor or at risk of falling into poverty, with remittances representing nearly 40 percent of household income. Most of the remittances are used to pay for daily consumption expenditures and basic household needs, and they are also critical for financing the current account deficit. Thirty eight percent of remittance recipients also use their remittances for health, 28 percent for education, 7 percent for saving and 6 percent for housing investment. Remittance beneficiaries are more likely to be women, microentrepreneurs, students and homemakers, to live in urban areas and to work in services, while less likely to be salaried workers than the population average.

XXV Magnoni et al. 2007. 

XXVI Brogan and McGuinness 2013; Keller and Rouse 2016c. Current account deficit is over 5 percent of GDP in 2018, is well above the LAC average of 1.5 percent of GDP and is higher than El Salvador at 4.7 percent in 2018, compared to the current account surplus of Nicaragua (0.6 percent) and Guatemala (0.9 percent) according to WDI.

XXVII Keller and Rouse 2016c: Sixty nine percent of remittance recipients are women and they receive more 58 percent more remittances than men headed households. Remittances constitute 38 percent of income in Honduras. Eighty eight percent of all recipient households report using remittances to cover daily consumption expenditures. Two in five remittance recipient households also use them for medical expenses. Remittance recipients are more likely to live in urban areas (58 vs 53 percent) though those living in rural areas have higher income share of remittances (41 vs 36 percent). Remittance recipients are also less educated (5.4 vs 5.9 years of education); less likely to work in rural areas (32 vs 36) and more likely to work in services (35 vs 30). 86 percent of the recipients spend remittances on consumption.

XXVIII World Bank 2015.


XXX Rojas-Suárez 2016; Magnoni et al. 2007.

XXXI Magnoni et al. 2007.

XXXII Orozco 2018. In addition to remittances, Nicaraguan diaspora consume home country goods, increasing the demand of agricultural commodities, and their visits to the country represent 15% of total tourism revenue.
Collective remittances and matching grants by governments could help the sub-region channel remittances into productive investment. Collective remittances, which refer to the remittances sent by migrant organizations in the host country for social and productive projects in their communities in the home country, have been used by several remittance recipient countries and show encouraging results to promote productive, income generating investment. However, in order for these projects to be scaled up and replace public services that need to be delivered by local governments, the studies suggest close collaboration of migrant organizations with local municipalities and other non-governmental organizations. These collaborations would help increase funding for projects through matching grants by local or central governments, increase the involvement of the migrants in the development and monitoring of the projects and most importantly allow migrants to influence policy reforms in the home country to improve business environment. However, despite its substantial remittance inflows, governments and the development agencies in northern Central America have not adopted institutionalized strategies to promote the investment of remittances in productive areas. For example, following the footsteps of Mexican community in the United States, hometown associations of Salvadoran migrants in the United States invested in community projects in El Salvador. However, due to lack of government support, they faced many challenges, including that the projects were not followed through or maintained upon completion and there was a lack of capacity to identify business opportunities in a highly informal economy.

The northern countries of Central America can learn to increase productive use of remittances from successful policies of other governments and organizations. Mexico’s three-to-one matching grants, reflecting the three-dollar grant by the government for every dollar remittance sent for selected projects, have been shown to increase employment and labor force participation in Mexican municipalities, with no effect on the preferences to migrate. Another field study that conducted a matching grant program for education in El Salvador in collaboration with Salvadoran migrants in the United States showed a significant increase in the remittance amount with matching grant program and positive impact on the educational outcomes covered by the program. Another project, carried out in collaboration with Germany and local NGOs, funded by European Union (EU) and the United Nations (UN), improved financial skills of remittance users through financial training and increased the use of remittances for investment and savings. The two key success factors of this project were the quality of the coaching sessions provided by savings and credit associations (SCAs) in Moldova combined with the availability of the necessary financial infrastructure. Another project, co-funded by the International Fund for Agricultural Development (IFAD) and the Inter-American Development Bank (IDB), entitled “Remittances and Rural Development in the Dominican Republic,” was implemented from 2005 to 2010 by the Banco de Ahorro y Crédito (ADOPEM). The project developed a regulated system to bring remitters and recipients into the Dominican Republic’s banking system and channel remittances into production-oriented investments run mainly by low-income women in rural areas. The project successfully helped microfinance institutions introduce remittances and remittance-linked products. Examples of successful collaborations between migrant groups, organizations, government and remittances recipients are ample and could help governments and other interested parties to implement their own innovative projects.

Women play a key role as recipients and managers of remittances. Men tend to migrate first, with women staying behind and managing the household financially. These women tend to spend remitted money on the nutritional, educational, and healthcare needs of household members, especially children, with a small portion allocated to investment. Furthermore, in LAC, and in Central America in particular, women are more likely than men to have informal jobs or be employed in low-skilled, low-paid occupations, and are less likely to be engaged in entrepreneurial activities. Gender discrimination and a gender gap in educational attainment and access to credit (women typically have more legal barriers to asset use and ownership, which limits their access to collateral) often prevent effective participation of women in the development of new businesses. For example, in Guatemala, female-owned firms tend to be smaller and less profitable and have lower levels of physical and human capital than firms owned by men (World Bank 2010). Governments should accelerate reforms that reduce gender inequality, empower women, and promote female entrepreneurship to unlock the full productive capacity of remittance inflows.
Policies that reduce the cost of sending remittances, and channel remittance inflows into the formal financial system, could increase productivity impacts. Notwithstanding recent technological advances in digital finance and mobile banking, the cost of sending remittances to EMDEs remains stubbornly high. Globally, sending remittances costs an average of 6.8 percent of the amount sent, with the aggregate annual cost of sending remittances estimated at over US$30 billion (Cecchetti and Shoenholtz 2018; World Bank 2020c). At 6 percent, the cost of sending remittances to LAC is below the EMDE average. However, it is still well above the Sustainable Development Goal (SDG) target of 3 percent. The cost of sending remittances to Central America is lower than the LAC average—sending US$200 from the United States to Guatemala, Honduras, El Salvador, and Nicaragua costs 4.5 percent, 3.4 percent, 3.5 percent, and 4 percent, respectively, and several economies made progress in reducing those costs over the last decade (Figure 5.7A). However, although households’ access to formal financial institutions in Central America is improving, it still lags LAC and EMDE financial inclusion levels (Figure 5.7B). Governments should promote a more active role for formal financial intermediaries, such as banks and microfinance institutions, in the remittances market by, for example, reducing entry barriers and promoting competition. This will allow remittance recipient households to gain better access to banking and financial services, and, as a consequence, will contribute to the more productive use of remittance receipts, especially in economies that receive sizable remittance inflows.

**Figure 5.7. Remittances in EMDEs and LAC, % of GDP**


### 5.4. Conclusion

EMDEs in Central America receive large amounts of remittance inflows, which surpass other types of private capital flows, including FDI. Compared to other LAC EMDEs, these economies depend more on agriculture, have higher levels of informality, poverty, and inequality, and often suffer from insufficient provision of public services. Therefore, remittances provide a vital source of income for many vulnerable households who otherwise lack the means to ensure an adequate quality of life.

Remittance inflows do not seem to significantly increase productive investment in Central America. Although remittances help improve learning and health outcomes, they are less frequently associated with the expansion of entrepreneurial activities and business investments. A high concentration of remittance recipients in rural areas (except El Salvador) and an informal economy, with limited education, entrepreneurial skills and access to finance, are likely to be among the causes of weak linkage between remittances and productivity. Moreover, shallow financial markets, high crime and extortion rates, high levels of corruption, burdensome business regulations, weak rule of law, poor quality of infrastructure, and country-specific challenges (such as political uncertainty) continue to deter more productive use of remittances in Central America. Therefore, easing these constraints would likely to increase the productive uses of remittances.
Governments should develop joint programs with NGOs to channel remittances into productive investment and decrease cost of money transfers. Learning from the lessons of other governments and organizations, Central American governments should develop sustainable institutional programs to increase and channel migrant remittances into productive areas. Research provides a wide range innovative, successful programs some of which are covered in this chapter. Also, given that sending remittances to LAC is still more expensive than many other regions, there is room for improving the cost and convenience of money transfers.

Creating a business-friendly environment and encouraging female entrepreneurship, are both vital to unlocking the productive potential of remittances. Many remittance receiving households in Central America are headed by women, who are more likely to allocate remittances to basic household needs and childcare rather than investment. In Central America, women still face more barriers than men in creating and developing new businesses and accessing financial services. Policies that promote female entrepreneurship and bridge gender gaps in education, access to credit, and property rights are critical to ensuring that remittance recipients have stronger incentives to save and allocate remittances to investment spending rather than consumption.
This chapter argued that to restore economic activity in the short run and to increase potential output over the long run, Central America should launch coordinated policy action in five areas: (i) GVCs; (ii) trade integration; (iii) formalization; (iv) management of volatility; and (v) remittances (for the northern Central American countries). The findings and recommendations of each chapter are summarized below:

- Trade costs are very high in Central America, with an intra-regional tariff-equivalent trade costs at 74 percent, on average, and ranging from 91 percent in El Salvador to 64 percent in Panama. In addition, transport costs are also high in the sub-region amounting to US$0.17 per ton-kilometer, on average, in Central America, above the estimated cost of US$0.06–0.11 in Sub-Saharan Africa and US$0.02–0.05 in advanced economies. These high costs are most likely to be driven by the sub-region’s low investment in infrastructure compared to other regions – at only 1.1 percent of regional GDP in 2017, Central America’s investment in infrastructure was below the LAC average of 1.5 percent and significantly below the estimated 6.2 percent needed to satisfy medium-term infrastructure demand. The findings of the analysis show that implementation of the WTO’s TFA to eliminate non-tariff barriers is estimated to reduce trade costs by 15.5 percent and increase intra-regional trade by 61 percent and the sub-region’s GDP by 4.3 percent by 2030. Extending these reductions to Mexico would increase trade between Central America and Mexico by 130 percent and Central America’s GDP by 6.7 percent by 2030. In addition, a 10 percent decline in intra-regional transport costs could boost intra-regional trade by 5 percent and the region’s GDP by 0.3 percent by 2030. Extending the reduction in transport cost between Central America and Mexico would increase the region’s GDP by 0.4 percent by 2030. These results suggest substantial gains for all Central American countries from regional collaboration to decrease trade and transport costs within them as well as with Mexico. The sub-region’s competitiveness, trade, and output could be significantly boosted, given strong political empowerment to SICA, upgrades in the sub-region’s infrastructure, and removal of tariff and non-tariff barriers (even at the relatively low common denominator of the WTO’s TFA).

- Central America’s participation in GVCs is higher than LAC average, but lower than other comparator economies such as those in Europe and Central Asia and East Asia and the Pacific, and with strong integration with the United States. The participation of Central America in GVCs expanded significantly during this past decade, especially in Panama. However, the sub-region mostly exports final products, largely of low sophistication, with small room for domestic value added, which is what the sub-region most needs to boost its productivity and create jobs. The foreign content of Central America’s exports has decreased from 22 to 19 percent between 2005 and 2015 across all countries and nearly all sectors, except for Panama’s re-exports of, limiting the sub-region’s potential to expand its exports production given their small sizes. Culprits are likely to be: (i) high trade barriers; (ii) cumbersome crossing processes; and (iii) weak infrastructure and logistics. The sub-region is also attracting reasonable amounts of FDI but compared to other regions with similar level of FDI, its connection to GVCs is weaker, suggesting underutilization of FDI, possibly due to distortions in the factor markets and weaker human and physical capital and integration to the global economy.

- At 39 percent of GDP and 40 percent of employment in 2016, Central America’s informal output and employment are larger than in the rest of LAC (at 32 and 34 percent, respectively) and well above advanced economies (at 18 and 16 percent, respectively). By most measurements, Costa Rica has the smallest and Guatemala, Nicaragua, and Honduras have the largest informal economies. Both informal output and employment in Central America have been decreasing during the past decade,
CONCLUSION

though they are still high and thus limit the sub-region’s potential growth. As in other countries and regions, Central America’s informal sector has lower productivity than its formal sector, with the exception of Panama, where workers in the informal sector are, on average, as productive as their counterparts in the formal sector. In the other Central American countries, especially in Honduras and Nicaragua, labor productivity in the informal sector is much lower than in the formal sector, suggesting that policy interventions are needed to address the issue. Results of the regression analyses suggest that informality in Central America is associated with lower levels of development, human capital, and trade. Thus, scaling up basic education, targeted skills and vocational training, and SME and farm support programs, together with implementation of the recommendations to deepen trade, will all help unleash this potential source of growth. Burdensome regulations and corruption are positively correlated with informality in Central America, so improving the overall business environment is also required. The results suggest that in Central America, improving human capital will help boost labor productivity in the informal sector more than improving access to credit.

Central American countries also need to adopt policies to manage volatility from trade and financial flows. The United States is the biggest trading partner of Central American countries and the major source of their remittances. About 90 percent of remittances to El Salvador, Guatemala, Honduras, and 50 percent of remittances to Nicaragua originated from the United States in 2017. The sub-region’s dependence on the United States in trade and remittances makes it vulnerable to the shocks in the United States’ economy—not the least of which is the impact of COVID-19 on the unemployment rate of the Latino population in the United States. The effect of economic uncertainty in the United States on the remittances, exports, and output of Central American economies has been estimated. Countries with stronger trade relationships with the United States such as Costa Rica and Panama, as well as El Salvador and Honduras, are those most affected by uncertainty shocks. On the other hand, the remittances channel is stronger than or as important as the trade channel for Guatemala, Honduras, Nicaragua, and El Salvador.

Remittance inflows to Central America surged from less than US$80 million in 1980 to over US$24 billion in 2019. About 80 percent of these remittances originated from the United States. Remittances seem to have promoted growth by decreasing poverty, increasing consumption and access to education. However, productivity in Central America has been stagnating despite a big surge in the sub-region’s remittance inflows in recent decades. Among the factors contributing to the weak linkages between remittances and productive economic activities are high concentration of remittance recipients in rural areas and in the informal economy, with low education and entrepreneurial skills, combined with shallow financial markets, weak infrastructure and institutions and high rates of crime and violence. Country level reforms would be effective to tackle these issues and develop programs to attract more remittances and channel them in productive investment. Regional reforms described earlier would also increase the potentials for the productive uses of remittances. Given that the recipients of remittances are predominantly women, supporting women entrepreneurs would increase the productive uses of remittances. Also, reducing the time and cost of money transfers, and broadening the base of intermediaries might encourage savings and, thus, investments.
7. Annexes
Annex 1 – Key economic indicators

Table A1. Key economic indicators of Central American countries and comparator groups
(Data are from 2018 unless otherwise indicated)

<table>
<thead>
<tr>
<th></th>
<th>SLV</th>
<th>GTM</th>
<th>HND</th>
<th>NIC</th>
<th>CRI</th>
<th>PAN</th>
<th>CAM</th>
<th>LAC</th>
<th>ECA</th>
<th>EAP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population in millions</td>
<td>6.4</td>
<td>17.3</td>
<td>9.6</td>
<td>6.5</td>
<td>5</td>
<td>4.2</td>
<td>8.5</td>
<td>18.8</td>
<td>17.3</td>
<td>76.8</td>
</tr>
<tr>
<td>GDP in billion (2010 US$)</td>
<td>23</td>
<td>55</td>
<td>21</td>
<td>12</td>
<td>50</td>
<td>49</td>
<td>37</td>
<td>192</td>
<td>491</td>
<td>832</td>
</tr>
<tr>
<td>GDP per capita (2010 US$)</td>
<td>3511</td>
<td>3160</td>
<td>2204</td>
<td>1860</td>
<td>9893</td>
<td>11724</td>
<td>5768</td>
<td>8248</td>
<td>27669</td>
<td>15784</td>
</tr>
<tr>
<td>GDP Growth 2018 (2010 US$)*</td>
<td>2.5</td>
<td>3.2</td>
<td>3.8</td>
<td>-3.8</td>
<td>2.7</td>
<td>3.7</td>
<td>2</td>
<td>2.1</td>
<td>3.4</td>
<td>3.8</td>
</tr>
<tr>
<td>GDP Growth 2017 (2010 US$)*</td>
<td>2.3</td>
<td>2.8</td>
<td>4.8</td>
<td>4.7</td>
<td>3.4</td>
<td>5.3</td>
<td>3.9</td>
<td>2</td>
<td>3.4</td>
<td>4.1</td>
</tr>
<tr>
<td>Labor productivity, GDP 2010 US$/worker</td>
<td>8519</td>
<td>7923</td>
<td>5012</td>
<td>4233</td>
<td>22370</td>
<td>25103</td>
<td>12193</td>
<td>16913</td>
<td>64864</td>
<td>39269</td>
</tr>
<tr>
<td>Poverty at 5.5 USD a day*</td>
<td>26</td>
<td>49</td>
<td>50</td>
<td>35</td>
<td>11</td>
<td>13</td>
<td>31</td>
<td>24</td>
<td>12</td>
<td>26</td>
</tr>
<tr>
<td>Gini coefficient*</td>
<td>39</td>
<td>48</td>
<td>52</td>
<td>46</td>
<td>48</td>
<td>49</td>
<td>47</td>
<td>46</td>
<td>32</td>
<td>36</td>
</tr>
<tr>
<td>External debt/GDP</td>
<td>71</td>
<td>29</td>
<td>43</td>
<td>91</td>
<td>49</td>
<td>NA</td>
<td>53</td>
<td>49</td>
<td>70</td>
<td>57</td>
</tr>
<tr>
<td>Gross government debt/GDP</td>
<td>67</td>
<td>24</td>
<td>40</td>
<td>37</td>
<td>54</td>
<td>39</td>
<td>39</td>
<td>60</td>
<td>56</td>
<td>45</td>
</tr>
<tr>
<td>Net general budget/GDP</td>
<td>-2.5</td>
<td>-1.7</td>
<td>0.3</td>
<td>-4.3</td>
<td>-6</td>
<td>-2</td>
<td>-2.7</td>
<td>-3.2</td>
<td>-0.2</td>
<td>-0.4</td>
</tr>
<tr>
<td>Current account/GDP</td>
<td>-4.8</td>
<td>0.8</td>
<td>-4.2</td>
<td>0.6</td>
<td>-3.1</td>
<td>-7.8</td>
<td>-2.7</td>
<td>-3</td>
<td>0</td>
<td>-1.2</td>
</tr>
<tr>
<td>Inflation</td>
<td>1.1</td>
<td>3.8</td>
<td>4.3</td>
<td>4.9</td>
<td>2.2</td>
<td>0.8</td>
<td>3.2</td>
<td>3.2</td>
<td>2.7</td>
<td>2.7</td>
</tr>
<tr>
<td>Savings/GDP</td>
<td>16</td>
<td>13</td>
<td>21</td>
<td>24</td>
<td>15</td>
<td>NA</td>
<td>18</td>
<td>19</td>
<td>24</td>
<td>33</td>
</tr>
<tr>
<td>Investment/GDP</td>
<td>20</td>
<td>12</td>
<td>26</td>
<td>23</td>
<td>19</td>
<td>NA</td>
<td>20</td>
<td>21</td>
<td>24</td>
<td>28</td>
</tr>
<tr>
<td>Innovation index</td>
<td>25</td>
<td>26</td>
<td>25</td>
<td>NA</td>
<td>36</td>
<td>32</td>
<td>30</td>
<td>30</td>
<td>44</td>
<td>44</td>
</tr>
<tr>
<td>Human capital index</td>
<td>0.5</td>
<td>0.5</td>
<td>0.5</td>
<td>0.5</td>
<td>0.6</td>
<td>0.5</td>
<td>0.5</td>
<td>0.6</td>
<td>0.7</td>
<td>0.6</td>
</tr>
<tr>
<td>Exports/GDP</td>
<td>29</td>
<td>18</td>
<td>42</td>
<td>42</td>
<td>34</td>
<td>NA</td>
<td>34</td>
<td>29</td>
<td>57</td>
<td>68</td>
</tr>
<tr>
<td>Imports/GDP</td>
<td>49</td>
<td>28</td>
<td>60</td>
<td>51</td>
<td>33</td>
<td>NA</td>
<td>43</td>
<td>36</td>
<td>57</td>
<td>63</td>
</tr>
<tr>
<td>Trade/GDP</td>
<td>78</td>
<td>46</td>
<td>102</td>
<td>93</td>
<td>67</td>
<td>NA</td>
<td>77</td>
<td>65</td>
<td>114</td>
<td>131</td>
</tr>
<tr>
<td>GVC Index**</td>
<td>32</td>
<td>27</td>
<td>30</td>
<td>31</td>
<td>32</td>
<td>31</td>
<td>30</td>
<td>24</td>
<td>56</td>
<td>43</td>
</tr>
</tbody>
</table>
### Annexes

<table>
<thead>
<tr>
<th></th>
<th>SLV</th>
<th>GTM</th>
<th>HND</th>
<th>NIC</th>
<th>CRI</th>
<th>PAN</th>
<th>CAM</th>
<th>LAC</th>
<th>ECA</th>
<th>EAP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Remittances</td>
<td>21</td>
<td>12</td>
<td>20</td>
<td>11</td>
<td>1</td>
<td>1</td>
<td>9</td>
<td>6</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Net FDI Inflows/GDP</td>
<td>1.6</td>
<td>1.4</td>
<td>5.7</td>
<td>2.7</td>
<td>4.6</td>
<td>10.1</td>
<td>4.9</td>
<td>4.2</td>
<td>0.3</td>
<td>5.2</td>
</tr>
<tr>
<td>Net ODA/GNI</td>
<td>0.2</td>
<td>0.2</td>
<td>0.2</td>
<td>1</td>
<td>0.1</td>
<td>2.7</td>
<td>0.8</td>
<td>0.5</td>
<td>0.1</td>
<td>0</td>
</tr>
<tr>
<td>Doing Business score†</td>
<td>65</td>
<td>63</td>
<td>56</td>
<td>54</td>
<td>69</td>
<td>67</td>
<td>62</td>
<td>59</td>
<td>73</td>
<td>63</td>
</tr>
<tr>
<td>Doing Business ranking†</td>
<td>91</td>
<td>96</td>
<td>133</td>
<td>142</td>
<td>74</td>
<td>86</td>
<td>104</td>
<td>116</td>
<td>54</td>
<td>92</td>
</tr>
<tr>
<td>Importing time (hours)†</td>
<td>49</td>
<td>104</td>
<td>168</td>
<td>88</td>
<td>106</td>
<td>30</td>
<td>91</td>
<td>99</td>
<td>41</td>
<td>121</td>
</tr>
<tr>
<td>Importing cost (US$)†</td>
<td>195</td>
<td>442</td>
<td>553</td>
<td>486</td>
<td>575</td>
<td>540</td>
<td>465</td>
<td>723</td>
<td>236</td>
<td>531</td>
</tr>
<tr>
<td>Exporting time (hours)</td>
<td>33</td>
<td>84</td>
<td>156</td>
<td>120</td>
<td>44</td>
<td>30</td>
<td>78</td>
<td>91</td>
<td>40</td>
<td>113</td>
</tr>
<tr>
<td>Exporting cost (US$)†</td>
<td>178</td>
<td>415</td>
<td>681</td>
<td>287</td>
<td>530</td>
<td>330</td>
<td>404</td>
<td>608</td>
<td>233</td>
<td>490</td>
</tr>
<tr>
<td>Time spent on tax compliance (hours)†</td>
<td>168</td>
<td>248</td>
<td>203</td>
<td>201</td>
<td>151</td>
<td>408</td>
<td>230</td>
<td>316</td>
<td>206</td>
<td>173</td>
</tr>
<tr>
<td>Total effective tax rate†</td>
<td>36</td>
<td>35</td>
<td>39</td>
<td>61</td>
<td>58</td>
<td>37</td>
<td>44</td>
<td>47</td>
<td>31</td>
<td>34</td>
</tr>
<tr>
<td>Registering a business time (days)†</td>
<td>17</td>
<td>15</td>
<td>42</td>
<td>14</td>
<td>23</td>
<td>6</td>
<td>19</td>
<td>28</td>
<td>13</td>
<td>26</td>
</tr>
<tr>
<td>Registering a business cost (% of GNI pc)†</td>
<td>43</td>
<td>17</td>
<td>28</td>
<td>66</td>
<td>10</td>
<td>6</td>
<td>28</td>
<td>31</td>
<td>4</td>
<td>17</td>
</tr>
<tr>
<td>Corruption perception, 0 high 100 low</td>
<td>35</td>
<td>27</td>
<td>29</td>
<td>25</td>
<td>56</td>
<td>37</td>
<td>35</td>
<td>42</td>
<td>55</td>
<td>48</td>
</tr>
<tr>
<td>Informal output (DGE method) **</td>
<td>41</td>
<td>46</td>
<td>44</td>
<td>41</td>
<td>22</td>
<td>40</td>
<td>39</td>
<td>32</td>
<td>34</td>
<td>26</td>
</tr>
<tr>
<td>Informal labor (self-employment) **</td>
<td>41</td>
<td>30</td>
<td>55</td>
<td>56</td>
<td>23</td>
<td>33</td>
<td>40</td>
<td>34</td>
<td>30</td>
<td>44</td>
</tr>
<tr>
<td>Agriculture Value added/GDP</td>
<td>4.9</td>
<td>10</td>
<td>11.6</td>
<td>15.3</td>
<td>4.6</td>
<td>2.2</td>
<td>8.1</td>
<td>4.7</td>
<td>1.9</td>
<td>8.1</td>
</tr>
<tr>
<td>Services value added/GDP</td>
<td>60</td>
<td>63</td>
<td>57</td>
<td>50</td>
<td>68</td>
<td>65</td>
<td>61</td>
<td>60</td>
<td>64</td>
<td>52</td>
</tr>
<tr>
<td>Manufacturing value added/GDP</td>
<td>16</td>
<td>18</td>
<td>17</td>
<td>14</td>
<td>12</td>
<td>5.8</td>
<td>14</td>
<td>13</td>
<td>14</td>
<td>28</td>
</tr>
</tbody>
</table>

Notes: All ratios and growth rates are in percentages; *All poverty and Gini data from 2018 except Guatemala and Nicaragua whose data are in 2014. + Latin American average does not include Venezuela. ** Data is from 2015 and LAC average only includes rest of LAC excluding Central America; † All data are from World Bank (2019c) Doing Business 2020 report covering 2019. ++ Data are from 2016. DGE refers to dynamic general equilibrium model. LAC average does not include Central America. Informal employment is proxied by survey-based self-employment data, see Elgin et al. (2019) and World Bank (2019) for details; † LAC average excludes Central America's average.
Annex 2 – Country-level analysis on the impact of uncertainty

7.4.1. Costa Rica

Trade via exports is an important transmission channel of uncertainty for Costa Rica. Close to 40 percent of Costa Rican exports are destined for the United States, while over 35 percent of its imports are sourced from there (Figure A1). As seen in Figure A2, an uncertainty shock reduces monthly economic activity in Costa Rica by around 0.4 percent during the first 18 months and reduces exports up to 1 percent for around 5–20 months after the shock.

Figures A1 and A2 illustrate the impact of uncertainty shocks on Costa Rican exports and economic activity.

Remittances represent less than 2.5 percent of its GDP. As there are not monthly data available, we do not run a model with remittances as a transmission channel for Costa Rica.

Source: WDI; EPU 2019; CBOE 2019.
7.4.2. El Salvador
About 45 percent of El Salvador’s exports go to the United States, and more than 30 percent of El Salvador’s imports originate in the United States (Figure A3). Like the other three Central American countries, El Salvador is linked to the United States economy through both international trade and remittances. According to World Bank estimations for 2017, more than 91 percent of the remittances received by El Salvador originated in the United States. Remittances represent more than 17.5 percent of the GDP (Figure A4).

Remittances to El Salvador originate largely in the United States, and they correlate strongly with the United States’ business cycle (Coronado 2009; Vargas-Silva and Huang 2006). In addition, Borja, K. (2012) finds that United States’ business cycles have an important, immediate, and lasting impact on remittances sent by Salvadoran workers located in the United States.

The models for El Salvador confirm that both trade and remittances are transmission channels of an external uncertainty shock. Figure A5 shows the IRF of an increase in uncertainty on El Salvador’s exports, remittances, and economic activity. The three Salvadoran variables show a substantial decrease after the VIX shock: remittances go down to 0.8 percent and this impact remains for about 4–30 months, as well as a decline in economic activity of up to 0.4 percent. The impact on exports lasts for a shorter duration, but is still significant (around 18–20 months) and is up to 1 percent (Figure A5).

Note: Remittances/GDP, exports/GDP, and economic activity indicators are in logs, and their IRFs above are presented in the same order.

Source: WDI; EPU 2019; CBOE 2019.
7.4.3. Guatemala

Guatemala is linked to the United States’ economy mainly through international trade and remittances. About 35 percent of exports from Guatemala are destined for the United States, and more than 70 percent of imports originate in the United States (Figure A6). Remittances represent more than 9 percent of GDP and according to World Bank estimations, in 2017 around 90 percent of the remittances received by Guatemala originated in the United States (Figure A7).

**Figure A6. U.S. share in Guatemalan exports and imports (%)**


**Figure A7. Remittances to Guatemala (% of GDP)**


**Figure A8. Impulse response function of the U.S. industrial production (log) to uncertainty (VIX) shock**

*Source: EPU 2019; CBOE 2019.*

...and according to World Bank estimations, in 2017 around 90 percent of the remittances received by Guatemala originated in the United States (Figure A7).

The findings reveal that remittances are a stronger transmission channel for Guatemala than trade. Figure A9 shows the IRF of Guatemala’s exports, remittances, and economic activity to an orthogonalized uncertainty shock (measured by the VIX). As seen in Figure A9, the shock:

- reduces the remittances to Guatemala up to 1 percent 8–30 months after the shock;

- moderately increases exports, after a short period of decrease; and

- reduces economic activity up to 0.2 percent during the first 20 months after the shock, after which the negative impact of the shock wears off, but the economy does not fully recover during the period analyzed (36 months following the shock).
Annexes

Figure A9. IRFs of remittances, exports, and economic activity in Guatemala to a US uncertainty shock

<table>
<thead>
<tr>
<th>Model</th>
<th>VIX -&gt; Inrem_gtm</th>
<th>VIX -&gt; Inx_gtm</th>
<th>VIX -&gt; Ineai_gtm</th>
</tr>
</thead>
<tbody>
<tr>
<td>90% CI</td>
<td>Orthogonalized irf</td>
<td>90% CI</td>
<td>Orthogonalized irf</td>
</tr>
<tr>
<td>Months after shock</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>10</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>20</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>30</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>40</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>90% CI</td>
<td>Orthogonalized irf</td>
<td>90% CI</td>
</tr>
</tbody>
</table>

Note: Remittances/GDP, exports/GDP, and economic activity indicators are in logs, and their IRFs above are presented in the same order.
Source: WDI; EPU 2019; CBOE 2019.

7.4.4. Honduras

Honduras also depends on the United States’ economy through remittances and trade. More than 30 percent of its exports are destined for the United States and more than 35 percent of its imports come from the United States (Figure A10). Remittances represent between 12 percent and 21 percent of its GDP, and more than 87 percent of the remittances received by Honduras are from the United States, according to the World Bank estimations for 2017 (Figure A11).

Figure A10. U.S. share in Honduran exports and imports (%)

Figure A11. Remittances to Honduras (% of GDP)

Source: WDI.

Arayavechkit, Scott, and Sousa (2018) find that the business cycles of the United States and the countries of the Northern Triangle (El Salvador, Guatemala, and Honduras) are highly synchronized, due to the strong trade and financial linkages between these countries. Higher economic growth in the United States results in higher United States’ imports from the Northern Triangle, as well as higher United States’ investment in these economies. In addition to these transmission channels (capital flows and trade), remittances are a growing financial link between the United States and these three economies.

Figure A12 shows the IRF of an increase in uncertainty (shock to the VIX) on Honduras’ exports, remittances, and economic activity. A shock to uncertainty in the United States:

- increases the remittances to Honduras up to 2 percent 15–32 months after the shock;
- reduces the exports of Honduras up to 1 percent around 10 months after the shock; and
- reduces Honduran monthly economic activity up to 0.5 percent 5–20 months after the shock.
The results suggest that both export performance and remittances are important channels through which poor economic performance and uncertainty in the United States can hit the Honduran economy. The fact that remittances to Honduras increase as a result of a negative shock to the United States’ economy may suggest that Hondurans’ perceived risk, given the historical context, increases along with the uncertainties in the United States. As mentioned earlier, remittances to Honduras and Guatemala have increased substantially during the last two years.

**Figure A12. IRFs of remittances, exports, and economic activity in Honduras to a US uncertainty shock**

![Graph showing the impact of a US uncertainty shock on remittances, exports, and economic activity in Honduras.]

Note: remittances/GDP, exports/GDP and economic activity indicators are in logs, and their IRFs above are presented in the same order.

Source: WDI; EPU 2019; CBOE 2019.

### 7.4.5. Nicaragua

More than 25 percent of Nicaragua's exports go to the United States (more than 40 percent since 2014), and 15–30 percent of imports originate in the United States (Figure A13). Nicaragua is also dependent on remittances (Figure A14), which represent more than 9 percent of its GDP. According to World Bank estimations for 2017, more than 50 percent of the remittances received by Nicaragua came from the United States.

**Figure A13. U.S. share in Nicaraguan exports and imports (%)**

![Bar chart showing the percentage of Nicaragua's exports and imports from the US from 2004 to 2018.]

Source: WDI.

**Figure A14. Remittances to Nicaragua (% of GDP)**

![Line graph showing remittances to Nicaragua as a percentage of GDP from 2004 to 2017.]

Results show that remittances are the main transmission channel for Nicaragua. Figure A15 shows the IRF of Nicaragua's exports, remittances, and economic activity to an orthogonalized uncertainty shock (VIX shock). The first observation from the figure is that the uncertainty shock causes an immediate reduction in remittances, exports, and economic activity in Nicaragua. However, the impact on exports is moderate and does not last more than three to four months after the shock. On the contrary, the drop in remittances is up to 1 percent and the impact on economic activity is up to 0.8 percent, and both last around ten to fifteen months.
7.4.6. Panama

Exports are transmission channels of external uncertainty in Panama. More than 30 percent of Panama’s exports go to the United States, while over 35 percent of its imports originate in the United States (A16). Figure A17 plots the IRF of a shock to external uncertainty (via the VIX) on Panama’s exports and economic activity. The shock has a statistically significant effect on Panamanian exports for around 15 months, with a drop of up to 1 percent (Figure A17). The impact on economic activity is less significant, lasting a few months, and amounting to up to 0.25 percent (Figure A17).

Figure A16. U.S. share in Panamanian exports and imports (%)

Source: WDI; EPU 2019; CBOE 2019. Note; A17 first figure is the IRF of exports and the second figure is the IRF of industrial output.

Figure A17. IRF of exports and economic activity in Panama to the US uncertainty shocks

Source: WDI; EPU 2019; CBOE 2019. Note; A17 first figure is the IRF of exports and the second figure is the IRF of industrial output.
Figure A18. Impact of COVID-19 on remittances through its impact on the U.S. industrial output

The U.S. industrial production index, index 2012=100, monthly, seasonally adjusted

Source: Federal Reserve Bank of St. Louis

IRFs of remittances/GDP: Guatemala, Honduras, Nicaragua and El Salvador

Note: IRFs - Impact on the Guatemala, Honduras, Nicaragua and El Salvador's remittances of a negative 15% of shock to the U.S. industrial output.
Source: Federal Reserve Bank of St. Louis and WDI.
Annex 3 – Country-level Analysis on Remittances

Figure A19. Remittances and labor productivity in El Salvador

A. Remittances and net FDI inflows, % of GDP

B. Labor productivity in El Salvador relative to LAC and OECD levels

C. Capital formation in El Salvador, % of GDP

D. Institutional quality in Central America

E. Public sector governance in Central America

F. Rule of law in Central America

Source: IMF, World Bank. A. Dashed lines indicate median for LAC. B. OECD (LAC) productivity level = 1. C. Gross fixed capital formation, % of GDP. D. Country's standing in the regional Doing Business ranking: a lower value indicates better quality of business environment. CPI refers to Corruption Perception Index (higher value indicates lower level of corruption). Solid lines indicate Mexico's rank—it is a regional leader in the ease of doing business. E. F. Higher values indicate better performance. Solid lines display OECD average.
Figure A20. Remittances and labor productivity in Guatemala

A. Remittances and net FDI inflows, % of GDP

B. Labor productivity in Guatemala relative to LAC and OECD levels

C. Capital formation in Guatemala, % of GDP

D. Institutional quality in Central America

E. Public sector governance in Central America

F. Rule of law in Central America

Source: IMF, Transparency International, World Bank. Notes: A. Dashed lines indicate median for LAC.; B. OECD (LAC) productivity level = 1. C. Gross fixed capital formation, % of GDP; D. Country’s standing in the regional Doing Business ranking; a lower value indicates better quality of business environment. CPI refers to Corruption Perception Index (higher value indicates lower level of corruption). Solid lines indicate Mexico’s rank, as it is the regional leader in the ease of doing business.; E. F. Higher values indicate better performance. Solid lines display OECD average.
Figure A21. Remittances and labor productivity in Honduras

A. Remittances and net FDI inflows, % of GDP

B. Labor productivity in Honduras relative to LAC and OECD levels

C. Capital formation in Honduras, % of GDP

D. Institutional quality in Central America

E. Public sector governance in Central America

F. Rule of law in Central America

Source: IMF, World Bank. A. Dashed lines indicate median for LAC. B. OECD (LAC) productivity level = 1. C. Gross fixed capital formation, % of GDP. D. Country’s standing in the regional Doing Business ranking; a lower value indicates better quality of business environment. CPI refers to Corruption Perception Index (higher value indicates lower level of corruption). Solid lines indicate Mexico’s rank—regional leader in the ease of doing business. E. F. Higher values indicate better performance. Solid lines display OECD average.
Figure A22. Remittances and labor productivity in Nicaragua

Source: IMF, World Bank. Notes: A. Dashed lines indicate median for LAC. B. OECD (LAC) productivity level = 1. C. Gross fixed capital formation, % of GDP. D. Country's standing in the regional Doing Business ranking: a lower value indicates better quality of business environment. CPI refers to Corruption Perception Index (higher value indicates lower level of corruption). Solid lines indicate Mexico's rank—a regional leader in the ease of doing business. E. F. Higher values indicate better performance. Solid lines display OECD average.
cdij is the fraction summed up over all country-industry (d,j) combinations who use inputs from industry i and country c using $\phi_{ij}$ as weights. $\phi_{ij}$ is the fraction of production from industry i in country c that is purchased as an intermediate good by industry j in country d.

13 Direct domestic content of gross exports is defined as $DDC_c = \hat{V}_c diag(B) EXG_B$, and indirect domestic content of gross exports (IDC) as $IDC_c = \hat{V}_c (B_{-A} X E X G - DDC)$. Where $B = (I-A)^{-1}$ is the local Leontief inverse, diagB a matrix that consists of the diagonal elements of the local Leontief inverse, and EXG a vector of gross exports.

14 Foreign final demand expenditure is equal to the sum of final consumption expenditure by households and government as well as gross fixed capital formation abroad. Domestic value added embodied in foreign final demand (FVD $V_F$) is defined as $FVD V_F = (\hat{V}_F F D)_{dp}$, where $\hat{V}$ is the diagonalized value added share of production, B the global Leontief inverse and FD the global final demand matrix showing the demand for country p.


China’s structural transformation was fueled by trade and foreign direct investment liberalization that encouraged intermediate input producers in China to expand their product varieties.


World Bank (2019).

16 Measured as $\sum_{c,j} = 1 \sum_s \sigma_{s,c} D_j$. $D_j$ is the distance to final demand in terms of number of production stages in country d and industry j. These are summed up over all country-industry (d,j) combinations who use inputs from industry i and country c using $\sigma_{ij}$ as weights. $\sigma_{ij}$ is the fraction of production from industry i in country c that is purchased as an intermediate good by industry j in country d.

17 See the Appendix for a detailed discussion on various definitions of informality: World Bank 2019b

20 See Perry et al. (2007, p.27) for a more detailed description of informal employment and different types of informal employment.

21 See La Porta and Shleifer (2014) and Loayza, Servén, and Sugawara (2010). As defined by the 1993 International Classification of Status in Employment (ICSE-93), self-employed workers are those who work on their own account or with one or a few partners or in a cooperative and hold the type of jobs defined as “self-employment jobs.” The other measure of informal employment comprises of all workers of the informal sector and informal workers outside the informal sector. The former covers all persons who, during a given reference period, were employed in at least one informal sector enterprise, irrespective of their status in employment and whether it was their main or a secondary job. The latter covers self-employment and employees holding informal jobs. See World Bank (2019) for details.

22 Here, following Gysman and van de Ven (2014), illegal production is production activities that generate goods and services that are forbidden by law or unlawful when carried out by unauthorized procedure. See Medina and Schneider (2018) and Schneider (2017) for a detailed comparison.

23 See Elgin et al. (2019) and World Bank (2019) for details. In the data set, the Multiple Indicators Multiple Causes (MIMIC) model is a model of structural equations that use observable causes and indicators to capture the latent level of informal output. Elgin et al. (2019) follow Schneider, Buehn, and Montenegro (2010) closely when estimating the MIMIC model for 160 countries over the period 1993-2015 (updated to 2016 by the author here). The dynamic general equilibrium (DGE) model of Elgin and Oztunali (2014) provides an alternative estimate of the size of the informal sector for 158 countries (36 AEs and 122 EMDEs) over the period 1950-2016. The details about the DGE model is provided in the Appendix. It is worth noting that both DGE and MIMIC estimates are updated here for Panama by using the estimate on informal output in year 2016 (provided by the national statistical office) as the benchmark. To make the measures comparable with those in the literature, both measures are reported.
in percent of official GDP. In the following sections, “in percent of GDP or output” is used as the equivalent of “in percent of official GDP” in the context of the share of informal output (both DGE-based and MIMIC-based estimates), while “in percent of employment” is used as the equivalent of “in percent of total employment.”

As shown in Figure 1, DGE and MIMIC estimates do not differ qualitatively. The same applies to survey-based and model-based shares of self-employment. For presentation simplicity, throughout this study, the output share of informality refers to the share of informal output based on DGE model estimates, unless otherwise noted. The two measures are preferred for their rich country and year coverage.

As shown in Loayza 2018, the ratio can be computed by using DGE-based informal output in percent of official GDP and self-employment in percent of total employment.

All model-based and survey-based figures confirm the same finding. Hence, the following sections focus on DGE estimates and survey-based shares of self-employment (SEMP, survey-based).

Models also predict that the informal sector may shrink during economic development, as households move away from agricultural and informal sectors as their incomes grow (Saracoglu 2008).

Distance to the frontier from Doing Business database is used here. The measure ranges from 0 to 100, where 0 represents the lowest performance.

Models also predict that the informal sector may shrink during economic development, as households move away from agricultural and informal sectors as their incomes grow (Saracoglu 2008).

As shown in Figure 1, DGE and MIMIC estimates do not differ qualitatively. The same applies to survey-based and model-based shares of self-employment (SEMP, survey-based).

Results are not reported in the interest of space but are available upon request. The following cross-section regressions are carried out in Table 1 and (2): \( y_i = \alpha + \beta x_i + \gamma C_i + \epsilon_i \) and \( y_i = \alpha + \beta x_i + \gamma C_i + \epsilon_i \), where \( y_i \) is the average informal output (DGE)/employment (SEMP)/productivity ratio over the period 1990-2016 in country \( i \), \( x_i \) is the variable of interest averaged over the period 1990-2016 in country \( i \), \( C_i \) is a dummy that equals 1 if country \( i \) is in Central America and 0 otherwise, and \( \epsilon_i \) is a set of regional dummies. “Access to credit” is measured as “domestic credit to private sector in percent of GDP”. “Trade openness” is proxied by “the sum of imports and exports in percent of GDP”. “Productivity ratio” are the ratios of informal labor productivity over total labor productivity.

See also Loayza, Servén, and Sugawara (2010) and La Porta and Shleifer (2014).

Empirically, greater access to credit has been associated with lower informality (Maloney 2004; Straub 2005; La Porta and Shleifer 2014).

Doing-Business scores cover a range of issues that could make business operation less productive. In particular, easy access to electricity or credit will help boost both informal and formal labor productivity. The finding is in line with Amin, Ohsorge, and Okou (2019), who found that a business environment that is freer and closer to best-practices is associated with a significantly narrow productivity gap between formal and informal firms.

See Bruhn and Loeprick (2014), Fajnzylber, Maloney, and Montes-Rojas (2011), Slonimczyk (2012), and Waseem (2018). See the Appendix (A3) for a review of empirical studies on the impact of reforms on formalization.

See the Appendix (A3) for details.

Unfortunately, the impact of the reform could be short-lived (e.g., Bruhn and Loeprick 2014) and not robust to various empirical strategies. In the latter case, Monteiro and Assunção (2012) and Piza (2016) showed the impact of SIMPLeS in Brazil on formalization and firm performance could be limited when using different identification strategies.

As summarized by Luttmer and Singhal (2014), tax administrators tend to place a great deal of emphasis on the importance of improving “tax morale,” by which they generally mean increasing voluntary compliance with tax laws and creating a social norm of compliance. They further provide a review of existing studies that demonstrate the important role of tax morale in shaping people’s tax compliance decisions.

In a randomized experiment in Malawi, Campos, Goldstein, and McKenzie (2018) found that providing firms with registration assistance jointly with the bank information session increases the use of formal financial services, and results in increases in firm sales by 20 percent and profits by 15 percent.


Unfortunately, the impact of the reform could be short-lived (e.g., Bruhn and Loeprick 2014) and not robust to various empirical strategies. In the latter case, Monteiro and Assunção (2012) and Piza (2016) showed the impact of SIMPLeS in Brazil on formalization and firm performance could be limited when using different identification strategies.

As summarized by Luttmer and Singhal (2014), tax administrators tend to place a great deal of emphasis on the importance of improving “tax morale,” by which they generally mean increasing voluntary compliance with tax laws and creating a social norm of compliance. They further provide a review of existing studies that demonstrate the important role of tax morale in shaping people’s tax compliance decisions.

In a randomized experiment in Malawi, Campos, Goldstein, and McKenzie (2018) found that providing firms with registration assistance jointly with the bank information session increases the use of formal financial services, and results in increases in firm sales by 20 percent and profits by 15 percent.


Unfortunately, the impact of the reform could be short-lived (e.g., Bruhn and Loeprick 2014) and not robust to various empirical strategies. In the latter case, Monteiro and Assunção (2012) and Piza (2016) showed the impact of SIMPLeS in Brazil on formalization and firm performance could be limited when using different identification strategies.

As summarized by Luttmer and Singhal (2014), tax administrators tend to place a great deal of emphasis on the importance of improving “tax morale,” by which they generally mean increasing voluntary compliance with tax laws and creating a social norm of compliance. They further provide a review of existing studies that demonstrate the important role of tax morale in shaping people’s tax compliance decisions.

In a randomized experiment in Malawi, Campos, Goldstein, and McKenzie (2018) found that providing firms with registration assistance jointly with the bank information session increases the use of formal financial services, and results in increases in firm sales by 20 percent and profits by 15 percent.
ENDNOTES

56 OECD 2020.
57 Borja 2020.
58 World Bank 2020b.
59 Wainer 2012.
60 Rajan and Subramanian 2005.
61 Barajas et al. 2009; Catrinescu et al. 2006; Chami et al. 2003.
63 Abdish et al. 2008.
64 Wainer 2012.
68 Ambler et al. 2015.
69 Lubambu 2014.
References


REFERENCES


