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External Shocks, Food Security, and Development

Exploring Scenarios for Central America

Eugenio Diaz-Bonilla

Valeria Piñeiro

Pablo Elverdin

Markets, Trade and Institutions Division

INTERNATIONAL FOOD POLICY RESEARCH INSTITUTE

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AUTHORS

Eugenio Díaz-Bonilla (E.Diaz-Bonilla@cgiar.org) is a visiting senior research fellow in the Markets, Trade and Institutions Division of the International Food Policy Research Institute (IFPRI), Washington, DC.

Valeria Piñeiro is a research coordinator in the Markets, Trade and Institutions Division of IFPRI, Washington, DC.

Pablo Elverdin is an independent consultant for IFPRI.

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ABSTRACT

We conduct an ex ante evaluation of the impacts of a potential global recession within the next years and the possible policy responses to support economic activity and improve social indicators in five Central American countries: Costa Rica, El Salvador, Guatemala, Honduras, and Nicaragua.

We review the economic and social evolution of the past decades in those countries, and we consider a global scenario that includes further deceleration of world growth, lower commodity prices, and a decline in remittances and capital flows to those countries.

We simulate those scenarios and related policy issues using recursive dynamic CGE models for the countries considered. The global shock is run under fixed exchange rates and flexible exchange rates (in the case of El Salvador, which has adopted the US dollar as the domestic currency, the simulation of a flexible exchange rate is just indicative). In all cases, a flexible exchange rate delivers better results in terms of GDP per capita, by softening the overall economic impact of the external shocks.

Two possible interventions to deal with the recession are simulated: one focuses on policies to strengthen the safety net for the poor; the other applies a more general macroeconomic stimulus (a tax cut plus a modest increase in public investments, financed by un-conventional monetary policy) to try to cushion the shock. For all countries except El Salvador, these two simulations are run with a flexible exchange rate.

In the first policy simulation GDP per capita in those countries does not change much, but the poor groups targeted clearly improve their incomes and consumption, helping them the most during the years of the negative shocks.

In the second simulation, the macroeconomic stimulus improves the performance of the economies, allowing GDP per capita to be higher than in the case of the shock alone.

In summary, facing a potential global downturn as the one simulated here, those countries that have flexible exchange rates and the use of domestic monetary policies can use a mix of adjustment in exchange rates combined with targeted poverty transfers and macroeconomic stimulus to alleviate the shock. El Salvador, which does not have the exchange rate and monetary instruments, will require further support from multilateral and bilateral sources to soften the shock.

Keywords: Central America, global recession, safety nets, macroeconomic policies

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1. INTRODUCTION

Central America is a region with small and open economies exposed to different global macroeconomic and natural shocks. This paper focuses on five countries in that region: Costa Rica, El Salvador, Guatemala, Honduras, and Nicaragua. They differ in their economic, social, and institutional structure, but there is still enough similitude and interdependence among them to merit a joint consideration.[1] The purpose of this analysis is to conduct an ex ante evaluation of the impacts of potential global macroeconomic scenarios within the next few years and the possible policy responses to support economic activity and improve social indicators.

In general, the impacts of exogenous shocks depend on their nature and intensity; the economic, social, and institutional structure of the country; and the policies implemented to soften the consequences of those shocks. The Central American countries suffered significant economic and political shocks during the 1980s that negatively affected their development. More recently they were also affected by the series of global economic events of the late 2000s, including the two food and oil price spikes in 2008 and 2011 and the world economic and financial crisis of 2009. In some of those countries, those recent shocks worsened migratory problems, with negative humanitarian and security spillovers for other countries. Currently, the world economy is clearly decelerating, as we subsequently discuss. A relevant question is what possible global scenarios should Central American countries consider in the short and medium term in order to discuss potential impacts and policy responses.

In Section 2 we review the economic and social evolution in the countries considered over the several past decades. In Section 3, we consider potential global scenarios in the short and medium term (a decade-long view of possible developments). In a fourth section, we simulate those scenarios and related policy issues using recursive dynamic computable general equilibrium (CGE) models for the countries considered. We discuss the results in the fifth section, and a final section concludes.

[1] The United Nations classification of regions includes Mexico, Belize, and Panama in Central America, along with Costa Rica, El Salvador, Guatemala, Honduras, and Nicaragua. Mexico is a larger country and member of the Organization for Economic Co-operation and Development, and Panama presents a different reality, considering the presence of the Panama Canal and an economic structure based mostly on transportation and financial services. Furthermore, the World Bank places Belize among the Caribbean countries. Therefore, trying to reduce the heterogeneity of the analysis, the focus of the paper is only on the five Central American countries mentioned in the text.

2. EVOLUTION OF SOCIOECONOMIC INDICATORS

Evolution of Gross Domestic Product

Table 2.1 shows the average growth rate of gross domestic product (GDP) per capita (measured in constant local currency) for the individual decades since the 1960s (data are from the World Bank; the 2010s cover 2010 through 2015) and for the whole period (1961–2015). The table also includes the coefficient of variation (the standard deviation of the growth rate divided by the average growth, during the whole period) as an indicator of volatility in growth.

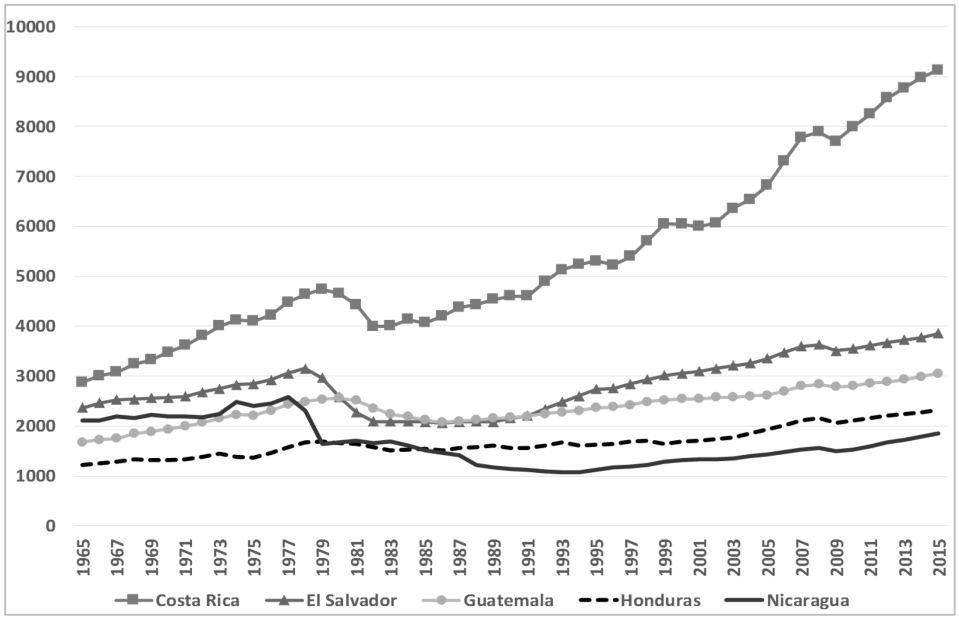
Table 2.1 GDP growth per capita

Country/Region	1960s (%)	1970s (%)	1980s (%)	1990s (%)	2000s (%)	2010s (%)	Average, 1961–2015 (%)	Coefficient of variation, 1961–2015
Costa Rica	2.5	3.6	-0.3	2.9	2.5	2.9	2.3	1.4
El Salvador	2.0	1.5	-3.3	3.8	1.6	1.6	1.1	3.6
Guatemala	2.7	3.0	-1.6	1.6	1.0	1.5	1.3	1.7
Honduras	1.8	2.7	-0.5	0.2	2.4	2.0	1.4	2.1
Nicaragua	4.3	-2.4	-3.2	1.0	1.6	3.6	0.5	11.2
Latin America and the Caribbean	2.8	4.1	0.1	0.7	1.8	1.4	1.8	1.3
Developing countries	2.9	3.6	1.5	1.0	4.5	3.9	2.8	0.7

Source: World Bank (2015b).
Notes: Coefficient of variation is the standard deviation divided by the average growth for the period.

Figure 2.1 shows the evolution over time of GDP per capita (from now on GDPpc; calculated in constant 2010 US dollars to facilitate comparisons across countries).

Figure 2.1 GDP per capita (constant 2010 US dollars)



Source: World Bank (2015b).

Costa Rica has had higher per capita growth rates (average of 2.3 percent per year) and less volatility (coefficient of variation of 1.4) than the other countries in the region. It has also been growing faster than Latin America and the Caribbean (LAC) as a whole,[2] but at a slower pace than the average for developing countries in general (Table 2.1). On the other extreme, Nicaragua shows the lowest growth in GDPpc (0.5 percent) and highest volatility (a large coefficient of variation of 11.2), followed by El Salvador (1.1 percent growth and 3.6 volatility). Much of that volatility, however, results from the multiple shocks of the 1980s (discussed subsequently). Considering the level of income per capita (Figure 2.1), Costa Rica is placed among the upper-middle-income group according to the classification of the World Bank,[3] while El Salvador, Guatemala, Honduras, and Nicaragua are in the lower-middle-income category.

Both Table 2.1 and Figure 2.1 show that Central American countries and LAC were hit hard during the early 1980s, due to a combination of increases in world interest rates, a strong recession in the United States and the world, and declines in commodity prices, all of which led to the debt crisis and the slow or negative economic growth of that period.[4] Central America was also badly affected in the 1980s by a series of military confrontations associated with Cold War geopolitics. Therefore, the magnitude of the economic slowdown was larger in that subregion than in LAC as a whole (Table 2.1). The peaks in GDPpc (measured in 2010 US dollars) that the countries in Central America had reached in the late 1970s, before all those negative global economic and geopolitical shocks, were not achieved again until several decades later: Costa Rica reached that level in the early 1990s; Honduras, Guatemala, and El Salvador only got back to the same GDPpc in the early 2000s; while Nicaragua, the country worst affected by the conflicts, with very low average growth and the highest volatility, has not yet reached the GDPpc of 1977 after almost four decades.[5]

Compared to the problems of the 1980s, the 2009 recessions in the Central American countries associated with the global financial crisis that started in 2007–2008 were smaller: in 1982, the worst year in the global recession of the 1980s, the unweighted average decline of GDPpc for all five countries was -6.3 percent (ranging between -3.5 percent and -9.8 percent), while in 2009 the average drop in GDPpc was a smaller, but still substantive, -3.1 percent (ranging between -2.3 percent and -4.1 percent). Furthermore, it should also be noted that all five countries experienced negative growth during the whole decade of the 1980s, while the period since the year 2000 shows positive growth on average.6 However, the performance of the Central American countries in the period after the recent global recession (2010–2015) has not been homogeneous: Costa Rica and Nicaragua grew at 2.9 percent and 3.6 percent, respectively, while El Salvador, Guatemala, and Honduras have experienced lower growth rates of 1.6 percent, 1.5 percent, and 2.0 percent, in that order. It should be noted that all five countries grew more than LAC, but less than developing countries as a whole.

A pattern can be noticed in Figure 2.1 that is made more evident in Figure 2.2, which combines the data for all five countries:[7] after the 2009 recession, GDPpc in each country, although it recovers and eventually surpasses the lows of the recession, stays below the previous trend (the same happens with

[2] By the mid-2010s Costa Rica has not only exceeded the GDPpc of all countries in Central America but also the average for LAC (in 2014 Costa Rica had about US$6,200 in GDPpc measured at 2005 US dollars, against some US$5,700 for LAC).

[3] The other two categories considered by the World Bank are "low income" and "high income." The low- and middle-income groups (the latter includes both lower-middle and upper-middle-income categories) are referred to in the text as "developing countries" in general. It should be noted that the International Monetary Fund (IMF) distinguishes "developing" (which would be mainly low-income and lower-middle-income countries in the categories of the World Bank) from "emerging" countries (mostly upper middle income according to the World Bank).

[4] The period of the 1980s has been called in LAC the "lost decade of growth."

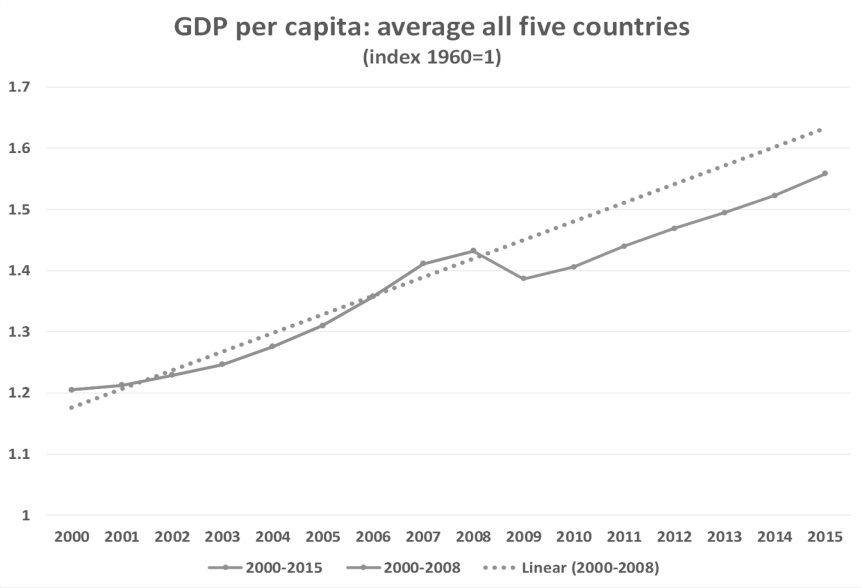
[5] While the text uses constant 2010 US dollars, similar patterns can be shown using GDPpc in constant local currency units.

[6] This is related to the fact that the region had relatively strong growth before the global 2009 recession, and that the world as a whole rebounded strongly in 2010 thanks to a very expansionary policy response coordinated at the global level that sustained growth going forward. However, as discussed subsequently, policy options may be more limited in the near future and the likelihood of a global slowdown is increasing significantly. Those potential scenarios are discussed later in this paper.

[7] Figure 2.2 shows the average for all five countries from 2000 to 2015 of the index of the level of GDPpc (based on data from World Bank 2015b).

total GDP, not shown). The dotted line is the lineal trend for the period 2000–2008, while the continuation in blue shows the actual evolution after the 2009 recession until 2015. As discussed later, our simulations capture this persistence of the negative effects of the shocks.

Figure 2.2 Average growth per capita before and after the 2009 recession



Source: World Bank (2015b).

Evolution of Selected Social Indicators

All of the countries have reduced poverty incidence (since the 1980s) and the percentage of undernourishment (since the 1990s) (Tables 2.2 and 2.3), although the evolution has been unequal. Costa Rica has done better than the rest of the region, and also compared with Latin America and developing countries in general. El Salvador shows better indicators for poverty than the other three countries, yet all four are in worse condition than the average for LAC.

Table 2.2 Poverty headcount ratio at $3.10 a day (2011 PPP) (% of population)

Country/Region	1985–1989	1990–1994	1995–1999	2000–2004	2005–2009	2010–2014
Costa Rica	24.9	17.7	13.1	12.1	7.4	4.0
El Salvador	35.6	35.2	34.9	23.8	17.7	14.7
Guatemala	62.0	na	26.7	27.2	23.7	26.5
Honduras	47.2	51.9	43.7	40.0	33.6	33.4
Nicaragua	na	42.2	37.6	40.7	32.3	25.2
LAC	33.6	29.5	26.7	25.8	17.9	12.9
Developing countries	67.6	65.2	59.6	55.0	46.2	37.5

Source: World Bank (2015b).
Notes: LAC = Latin American and the Caribbean; PPP = purchasing power parity; na = not available.

Table 2.3 Prevalence of undernourishment (percentage of population)

Country/Region	1990–1994	1995–1999	2000–2004	2005–2009	2010–2015
Costa Rica	5.4	5.7	5.5	5.5	5.4
El Salvador	15.5	14.9	10.1	10.9	12.6
Guatemala	15.2	19.2	18.9	15.6	15.2
Honduras	22.2	19.6	17.8	15.9	13.4
Nicaragua	51.7	41.5	29.2	22.5	18.3
LAC	15.6	14.3	11.7	9.3	8.3
Developing countries	23.4	20.2	18.3	16.5	13.6

Source: World Bank (2015b).
Notes: LAC = Latin America and the Caribbean.

Although poverty and undernourishment indicators should move relatively closer together,[8] in Guatemala poverty is shown as increasing in the 2010s while undernourishment declines, and the reverse happens in El Salvador (poverty appears declining in the last period while undernourishment increases).

There are no similar data with which to compare the impact of the economic and geopolitical crises of the 1980s on poverty and undernourishment. Regarding the impact during the last crisis, Tables 2.4 and 2.5 provide some further analysis of the variables over time.

Table 2.4 Incidence of poverty (percentage of population)

Country	Average 2007–2008	2009	Highest incidence during or after the crisis	Year of the highest incidence
Costa Rica	6.0	6.6	6.6	2009
El Salvador	16.3	17.5	18.6	2010
Guatemala	23.7[a]	No data	26.5	2011
Honduras	30.7	26.8	37.3	2012
Nicaragua	39.4[b]	25.2	25.2	2009

Source: World Bank (2015b).
Notes: [a] 2006. [b] 2005.

Table 2.5 Incidence of undernourishment (percentage of population)

Country/Region	Average 2007–2008	2009	Highest incidence during or after the crisis	Year of the highest incidence
Costa Rica	5.2	5.3	5.7	2013
El Salvador	11.1	11.5	12.9	2012
Guatemala	15.3	15.2	15.6	2014
Honduras	15.6	15	15	2009
Nicaragua	21.9	21	21	2009

Source: World Bank (2015b).

[8] Besides the obvious link between poverty and food insecurity, there is also a definitional link: the general poverty line is based on the cost of minimum caloric requirements that also define undernourishment, plus an additional margin of goods and services covering other basic needs (and the line for indigence is usually only the cost of minimum caloric requirements with few additional expenditures). Therefore, measurements of poverty and food insecurity based on consumption of calories should move closely together by statistical construction. However, differences in the sources of data and methodologies used for the poverty and food insecurity indicators weaken the empirically observed links between these two measurements.

The indicators on the incidence of poverty, with lags in some cases, seem to have worsened after the 2009 crises (except in the case of Nicaragua); the same occurs regarding the incidence of undernourishment (except in the cases of Honduras and Nicaragua). But comparing Tables 2.4 and 2.5, it appears that after the initial shock poverty and undernourishment indicators did not worsen further, but rather they seem to have been improving lately.

Summary

The global economic and political problems of the 1980s and the 2009 world recession both negatively affected economic growth and incomes per capita in Central America, although the decline in the 1980s was deeper. Moving to poverty and undernourishment, recent data suggest that the recent global economic problems were associated with a higher incidence of poverty and undernourishment in most of the countries considered. There are no comparable data across countries with similar methodologies for the 1980s, but given that (as noted) the economic decline was then worse than in 2009, the negative impacts on social indicators must also have been stronger.

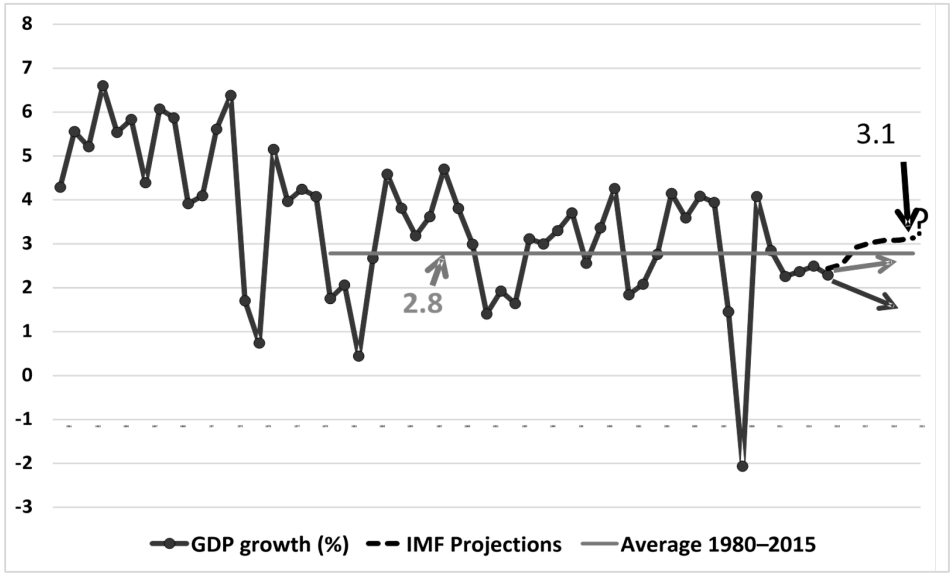
The next section discusses potential global economic scenarios and the channels through which they may affect Central American countries.

3. POTENTIAL SCENARIOS

Growth

A main question is this: will the world finally emerge from the global financial crisis of 2007–2008 that led to the 2009 recession, the largest at the global level since the Great Depression of the 1930s, or, on the other hand, will the global economy enter another period of slowdown, or even recession, in the next one to three years?[9] Figure 3.1 shows the growth rate of the world economy (total, not per capita) since the 1960s and alternative future trends.[10]

Figure 3.1 World growth rate (market exchange rates)



Source: World Bank (2015b) and IMF (2016).
Notes: GDP = gross domestic product; IMF = International Monetary Fund.

Figure 3.1 shows the significant drop in world GDP growth in 2009 and the strong rebound of the world economy in 2010, due to expansionary fiscal and monetary policies globally coordinated by governments and international organizations. Since then, global growth, although still positive, has been declining (that is, the world is still growing but at lower rates). Official projections of international organizations suggesting a return to high growth rates in recent years have been repeatedly adjusted downward in line with the gradual global slowdown. The last International Monetary Fund projections (dotted black line; from the World Economic Outlook database, April 2016) are above the average for the last 30 years (blue line), while the recent downturn in trend (red line) suggests further declines in global growth.

[9] Here we discuss the short-to-medium-term cycles. Longer-term growth trends, which appear to be slower than in the last two decades, are discussed in Díaz-Bonilla (2016a).

[10] World growth estimates may differ depending on whether the aggregation is made using market exchange rates (MERs, which reflect the values at which transactions take place in international markets with the prevailing exchange rates) or at purchasing power parity (PPP) values (these estimates reflect a more stable valuation of national incomes that is separate from transitory changes in market exchange rates). Figure 3.1 in the text reflects the aggregate with market exchange rates, which tends to be lower than when calculated in PPP terms, because the latter gives a greater weight in the aggregation to developing countries, which have been growing faster lately. It should be noted that individual growth rates for each country do not change (if they were calculated, as they should be, in constant local currency units) with either method. The only difference is the weight for the aggregation given to each country at MERs or PPP values. In any case, the trends discussed in the text are similar with both types of aggregation.

A convergence of factors increases the probability of a global economic slowdown or recession in the next two to three years (see Díaz-Bonilla et al. 2014 and Díaz-Bonilla 2016a): the reduction of the strong expansionary bias of monetary policy in the United States, now that the Federal Reserve has finished the policy of quantitative easing and has begun to normalize interest rates from December 2015; the fragile fiscal and banking situation in Europe and other developed countries; Japan's fiscal difficulties, where the aggregate public- and private-sector (including families) debt exceeds 500 percent of GDP; overinvestment in China generated by export policies and the significant increase in aggregate debt as a result of the large monetary and fiscal stimulus since 2009; and difficulties in emerging economies generated by the reversal in capital flows linked to the change in monetary policy in the United States and other industrialized countries, and adverse developments in commodity markets.

Although the monetary and fiscal stimulus engineered since 2010 helped the world avoid a worse recession in 2009, those policies have also led to a worrying increase in world debt, both in developed and developing countries and encompassing the public sector and also the three components of the private sector (households, companies, and financial institutions). In fact, the McKinsey Global Institute estimated that total world debt grew from 142 trillion dollars in the fourth quarter of 2007 (at the beginning of the recent crisis) to 199 trillion dollars at the end of 2014; this implies that total debt has gone from 269 to 286 percent of global GDP in that period (McKinsey Global Institute 2015).

A disorderly management of fiscal, monetary, and financial conditions in developed and emerging countries may lead to a new global recession in the near future, but then many governments will no longer have the fiscal and monetary space to implement countercyclical policies comparable to those applied in 2009–2010. In particular, a concern is the level of debt of private companies and governments in some emerging economies that are being affected by falling commodity prices and capital outflows, all of which is generating devaluations affecting the payment of foreign currency debts. Those companies and countries will be hardest hit by subsequent increases in global interest rates (IMF 2015).

Economic growth has already suffered in many LAC countries, in part as a result of the current world economic deterioration and the decline in the prices of the region's commodity exports. After enjoying GDPpc growth above 3 percent through part of the 2000s, LAC per capita growth turned negative in 2015, and projections by international organizations indicate negative per capita growth in 2016 as well (World Bank 2015a).

As small economies, the Central American countries are affected by changes in growth rates in other regions, but the linkages do not seem to be the same across all of them. Table 3.1 shows simple correlation coefficients in GDPpc growth across countries/regions. Cells in dark grey indicate correlations above 0.50 (that is, a change of 1 percent annual growth rate in a partner country/region appears correlated with a change of 0.50 percent annual growth rate in the reference country); cells in grey are correlations of more than 0.30 and less than 0.50; and in the white cells, the correlations are less than 0.30.

Table 3.1 Correlations in gross domestic product per capita growth, 1990–2015

	Costa Rica	El Salvador	Guatemala	Honduras	Nicaragua
Costa Rica	1.00	0.59	0.65	0.37	0.26
El Salvador	0.59	1.00	0.66	0.24	0.01
Guatemala	0.65	0.66	1.00	0.42	0.39
Honduras	0.37	0.24	0.42	1.00	0.30
Nicaragua	0.26	0.01	0.39	0.30	1.00
LAC	0.36	0.18	0.40	0.57	0.45
USA	0.50	0.51	0.42	0.24	0.56
China	0.42	0.39	0.37	0.45	0.00
European Union	0.31	0.51	0.56	0.22	0.51
World	0.44	0.36	0.51	0.48	0.71

Source: Authors' worksheets.

The growth rates of Costa Rica, Guatemala, and El Salvador seem more related to each other than to Honduras and Nicaragua, while the last two countries (but particularly Nicaragua) have smaller correlations with the neighboring countries. Growth in the United States and the European Union appears correlated with growth in most Central American countries, except Honduras, which seems more correlated with growth in LAC. Although with somewhat lower intensity than in the case of the United States and the European Union, China's growth also seems correlated with the growth performance in Costa Rica, Guatemala, El Salvador, and Honduras, but not Nicaragua.

Prices of Commodities

A combination of slow global growth, technological change in energy, and other macroeconomic factors[11] has led to a fall in energy prices: by the first quarter of 2016 the average oil price had declined about 60 percent from the average in 2011–2014 (data from World Bank's Pink Sheet Commodity Database).[12] Prices of agricultural commodities also declined since the last peaks in 2008 and 2011. For Central American countries, which are basically net oil importers, the decline in the price of that product is a positive terms-of-trade effect, while the declines in the prices of sugar, coffee, and bananas are negative shocks as net exporters, with the impact of the other food products depending on the respective net trade position in them (see Díaz-Bonilla and Torero 2016).

Remittances and Capital Flows

In addition to the impacts on growth and commodity prices already mentioned, a new recession could potentially entail declines in remittances and capital flows. Table 3.2 shows the importance of remittances as a percentage of GDP for the five countries considered.

Table 3.2 Personal remittances, received (percentage of GDP; average 2010–2014)

Costa Rica	1.3
El Salvador	16.3
Guatemala	9.9
Honduras	16.3
Nicaragua	9.6
LAC	1.3
Developing countries	1.7

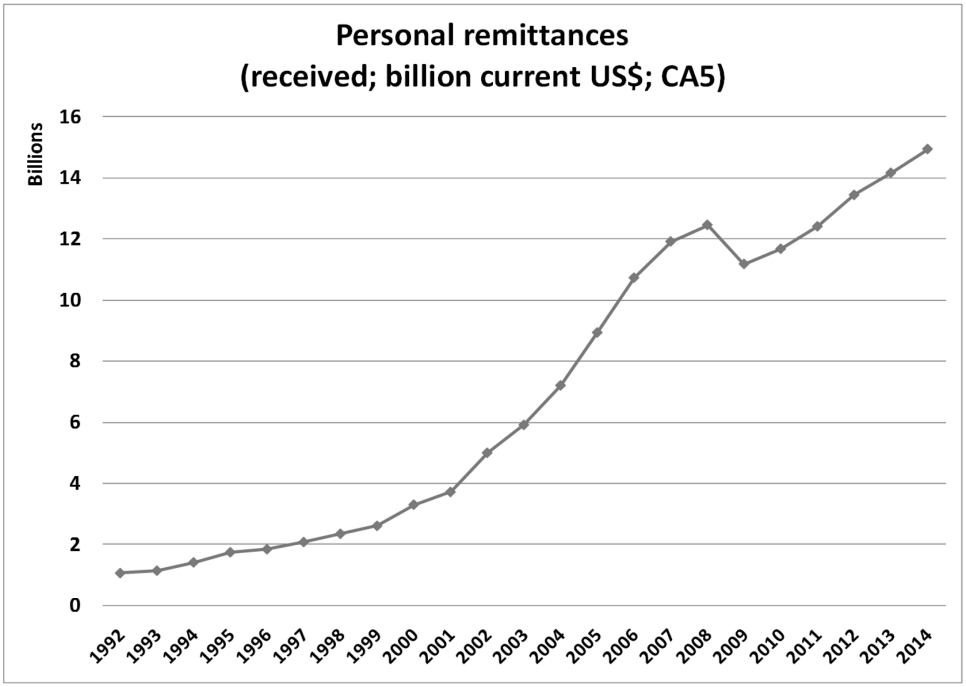
Source: World Bank (2015b).
Notes: GDP = gross domestic product; LAC = Latin American and the Caribbean.

Except for Costa Rica, the countries show a far larger incidence of remittances as a percentage of GDP compared with the rest of LAC, or developing countries as a whole. Figure 3.2 shows the evolution of remittances during the past decades (in nominal dollars) for all five countries combined.

[11] The US dollar has been strengthening, which lowers commodity prices; the growth slowdown in China, as well as uncertainties in growth and financial prospects elsewhere in the world, is also putting downward pressure on commodity prices, particularly energy and metals (see Díaz-Bonilla 2015).

[12] See Díaz-Bonilla (2013).

Figure 3.2 Remittances (in billion US dollars)



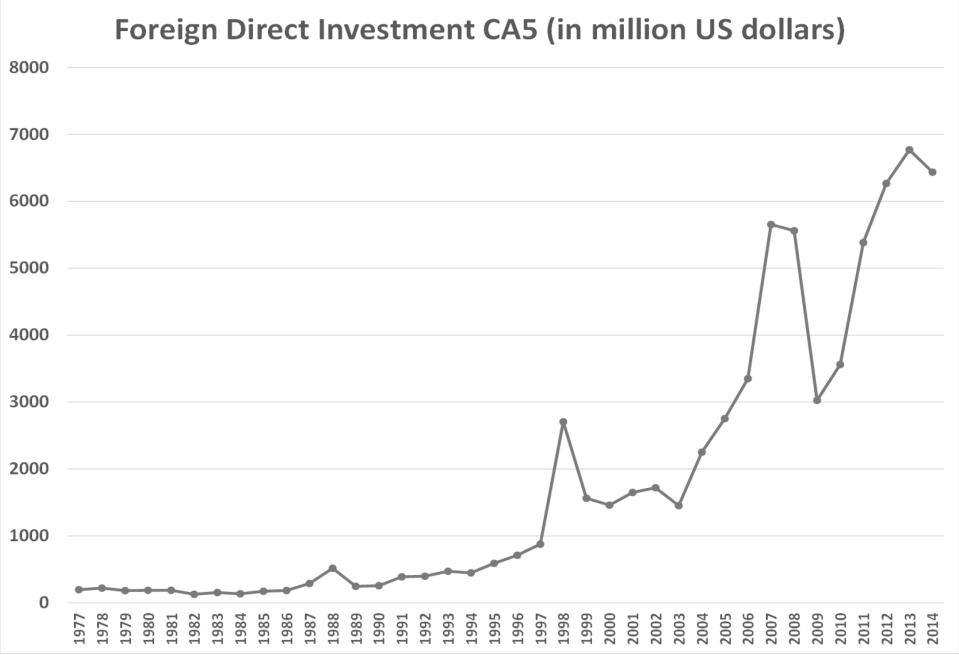
Source: World Bank (2015b).
Notes: CA5 refers to all five countries.

Remittances have been growing in the aggregate for all five countries (although as noted in Table 3.2, they are far less relevant for Costa Rica). There was a noticeable decline in 2009: about a US$1.3 billion drop or somewhat more than 10 percent from the 2008 peak. This was associated with the recessions in the United States and the European Union (the main sources of remittances), and in particular their construction sectors. After that, remittances started to increase again, but it took two to three years to reach the same pre-2009 levels. Also the growth trend in remittances has been slower than in the previous years: from 2000 to 2007 the nominal value of remittances increased at about 21 percent per year on average, but in 2010–2014 the annual growth rate had slowed down to about 6 percent.

Figure 3.3 shows foreign direct investment (FDI, a component of private capital flows) in millions of dollars. One can clearly see the large nominal increases in FDI during the first part of the 2000s, the decline in 2009, and the subsequent recovery to levels above the 2008 peak. FDI is only a component of the capital/financial account,[13] which includes other financial flows, such as loans and portfolio investments. Those financial flows plus the use of official reserves are the counterpart to the current account: if the latter is negative (a deficit in the current account), it means that a country is borrowing from the rest of the world (through FDI public and private loans, and so on), is using official reserves to pay for the deficit, or both.

[13] The new IMF methodology for balance-of-payments accounting distinguishes a capital and a financial account; in the past, the current financial account was usually called the capital account. Here we use the combined name "capital/financial account."

Figure 3.3 Foreign direct investment (millions of US dollars, for all five countries combined)



Source: World Bank (2015b).
Notes: CA5 refers to all five countries.

Table 3.3 shows the countries' current accounts. The current account consists of a combination of the net trade in goods and services, plus net payments of interest and other primary income, plus net receipts of personal and other transfers (this item includes net remittances). Those remittances represent a positive financial inflow to the economy that only partly compensates for the negative trade balance and payments of interest and related items.

Table 3.3 Current account (percentage of gross domestic product)

Country	Average 2005–2008	Average 2010–2014	Reduction in deficits comparing both periods	Reduction in the 2009 deficit compared to 2008
Costa Rica	-6.7	-4.6	-2.1	-7.4
El Salvador	-5.8	-4.7	-1.0	-5.6
Guatemala	-4.6	-2.4	-2.2	-4.3
Honduras	-9.4	-7.4	-2.0	-11.6
Nicaragua	-15.3	-9.9	-5.4	-9.1

Source: World Bank (2015b).

All the countries show significant current account deficits in the past few years. The 2009 recession marks important adjustments in the current accounts compared with 2008 (last column), what has been called "sudden stops" (see Calvo 1998) referring to the fact that capital flows that were financing the deficit "stopped" flowing. This implies the need to reduce the trade deficit, which was also further compressed because of the decline in remittances. Table 3.3 also shows that the countries reduced their deficits in the period after 2009 when compared to the previous one, implying lower financial inflows in their economies.

Potential Scenarios: Shocks and Policy Responses

In this paper we consider a global scenario that includes further deceleration of world growth, lower commodity prices, and a decline in remittances and capital flows to Central American countries. Compared to the experience since 2007–2008, we do not consider the type of price spikes in commodities that happened in 2008 and 2011. Rather, the scenario is one of declining nominal prices with a slow rebound to the baseline values. This is related to the other assumption of the scenario simulated, which is the expectation of a further slowdown in global growth with a slow recovery to previous levels. The sharp rebound in world growth that happened in 2010 (see Figure 3.1) is not likely to happen in the next global recession given the constraints in deploying a strong fiscal and monetary policy response similar to the one that followed the 2009 crisis. The scenarios are further explained in subsequent sections, along with the policy responses considered.

4. THE MODEL

We use a dynamic CGE model to simulate different scenarios and possible alternative economic policies, based on the standard model used by IFPRI (see Lofgren, Harris, and Robinson 2001 and Thurlow 2004).

General Considerations[14]

The model is recursive dynamic and is solved in two stages. First, the model determines a within-period equilibrium, given parameters and exogenous variables. Second, some parameters and exogenous variables change over time. The model contains transition equations that determine how the exogenous variables and parameters relate to past solution values for particular endogenous variables or are assumed to grow according to some exogenous path. These transition equations define the values for all exogenous variables and parameters for the next period for the static CGE model, which is then updated and solved for a new within-period equilibrium. Thus the economy evolves through a sequence of temporary equilibria (see Hicks 1939 and also Grandmont 2006).

The model is solved forward in a dynamically recursive fashion, starting with the base year for the data, with each temporary-equilibrium solution depending on current and past values of variables and parameters. It covers 10 years for a baseline run (a "business-as-usual" scenario) and for each one of the different scenarios analyzed in this paper. The behavior of agents is based on historical information and model-consistent expectations for the period of the temporary equilibrium.

The model includes an equation that relates changes in investment to changes in total-factor productivity for each production function. The increase of the level of investment can bring changes in national productivity through several channels, including learning by doing and access to new knowledge, and by gaining access to capital goods and intermediate goods of better quality (see, for instance, De Long 1992 and De Long and Summers 1991 for equipment investment, and Calderón and Servén 2010 for infrastructure investment).

First Step: The Single-Period Solution

Each producer maximizes profits under constant returns to scale and perfect competition. Different factors of production—including labor, land, and capital—are further divided as discussed in the different social accounting matrixes (SAMs; see below). Production is related to factor inputs in a constant elasticity of substitution (CES) production function, which allows producers to substitute the different factors until they reach the point where the marginal revenue of each factor equals the factor price (wage or rent). Intermediate inputs are utilized according to fixed coefficients in a Leontief-type input-output matrix. Finally, output prices depend on the value-added (cost of labor, land, and capital), the intermediate inputs, and any relevant taxes and subsidies.

The aggregate output of each good or service[15] (let's call it QQ) may be sold domestically (QD) or it may be exported (QE) (Figure 4.1). The producers' allocation between domestic sales and exports is specified via a constant elasticity of transformation (CET) function, assuming imperfect transformability between exports and domestic sales.

$$QX = CET(QD, QE). \quad (1)$$

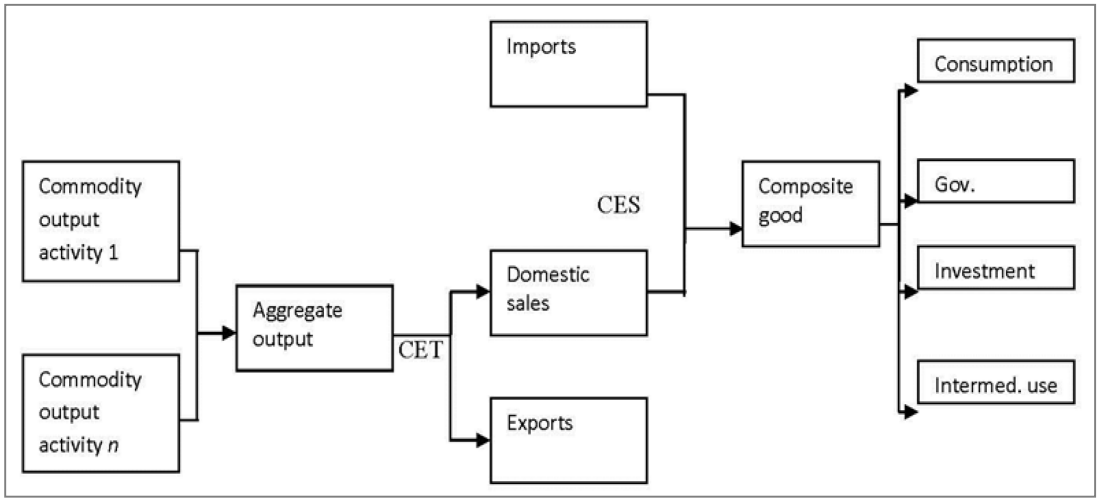
The producers will sell their products to the market with the highest profitability. The domestic price of the exported good (PE) is the international price multiplied by the exchange rate plus any possible export taxes or export subsidies.

[14] This section is in part based on Morley and Piñeiro (2013).
[15] In what follows, we will refer simply to as "goods."

The domestic good (QD) is combined with imports (QM) to produce the composite good that is used internally by the country (QQ). The domestically produced and imported goods are imperfect substitutes according to the CES (Armington 1969).

$$QQ = CES(QD, QM). \quad (2)$$

Figure 4.1 Flow of goods from producers to the national composite commodity



Source: Lofgren, Harris, and Robinson (2001).
Notes: CET = constant elasticity of transformation; CES = constant elasticity of substitution.

In this model, three institutions—households, government, and the rest of the world—perform three functions: produce, consume, and accumulate capital. Household income is the sum of salaries, profits, and transfers from the government and the rest of the world. Households save a constant fraction of their disposable income and buy consumption goods with the remainder. Household consumption of goods and services (the different QQs) is determined by a linear expenditure system. Government receives taxes, consumes goods and services, and makes transfers to households. The capital account collects the savings from the households, government, and rest of the world, and buys capital goods (investment).

Factor Markets and Macro Closures

The macro closures of a model define the mechanisms that determine how various macro constraints are satisfied by the economic system. Three macroeconomic balances need to be specified: (1) the external balance, which equates the supply of and demand for foreign exchange (in flows, given how the data are collected in the SAMs); (2) the fiscal balance, government savings (or deficit) being the difference between government income and expenditures; and (3) the overall savings-investment balance for the economy. The closures used are discussed later in the different scenarios.

Second Step: Between Periods

In the second stage, intertemporal equations create the dynamic linkages that update the variables that drive growth between periods. Those equations provide values for all exogenous variables needed for the next period, and the CGE model is then solved for a new temporary equilibrium. The model is solved forward in a dynamically recursive fashion, with each static solution depending only on current and past variables. As noted, the behavior of the agents is model consistent within each temporary equilibrium. The variables and parameters used as linkages between periods are the aggregate capital stock (which is

updated endogenously, given previous investment and depreciation), population, the domestic labor force, and factor productivity (which are updated exogenously, based on historical trends, as discussed subsequently).

The allocation of new capital across sectors is done by adjusting the proportion of each sector's share in aggregate investment as a function of the relative profit rate of each sector compared with the average profit rate of the economy as a whole. Sectors with higher average profit rates will get higher shares of the available investment, and those with lower rates will get lower shares. Once new investment has been allocated to a sector it remains there (that is, the reallocation of capital due to changes in profitability across sectors takes place only through new investment).

Growth in the labor force by skill class is exogenous and related to population growth, which in turn is based on population growth projections taken from national data (as reported in the World Bank's World Development Indicators database). Those additional workers are added to the supply of skilled labor or to the surplus of unskilled labor. For unskilled labor, the total size of the available labor force does not affect the solution in any period because in the simulations it is assumed that there is an excess of unemployed labor, which is not necessarily absorbed by the end of our simulations.

The growth of capital is determined by the amount of investment, net of depreciation. We also update the rate of disembodied technical change exogenously, based on historical values.

There are other exogenous variables (such as, among others, export and import prices and transfers to and from the rest of the world), policy instruments (for example, import tariffs, several tax rates, and subsidies), and parameters in the model that can be changed exogenously over time to determine the effects of such changes on the economy.

The simulations for the countries considered give us the growth path for the economy for 10 years under a number of different shocks and policy alternatives. We compare those paths with the one obtained using the baseline simulation (in which no shocks or exogenous policy changes are included).

The Social Accounting Matrix

In all cases, each SAM contains specific features for each country, which largely depend on the availability of data and the level of disaggregation contained in the different input-output matrixes and household surveys conducted by each country. The base year of each matrix also varies by country, depending on data availability.

Costa Rica

In this case, we use the 2011 SAM built by Piñeiro and Elverdin. The SAM is disaggregated into 83 sectors and four specific regions (Brunca, Huetar, Central, and Chorotega). At the same time, the families are separated into rural and urban, and the household consumption shares are obtained from the 2013 Household Income and Expenditure National Survey[16]. There are six factors of production: land, capital, and four labors (divided into skilled and unskilled, and rural and urban).

El Salvador

The SAM is for 2005 and was used in a previous work of Morley, Piñeiro, and Robinson (2011). The SAM is divided into 44 sectors and four regions. The 44 sectors include six agricultural activities. The SAM has been regionalized using information from the 2011 Household Survey Multipurpose[17] and the IV Agricultural Census (conducted in 2007/2008)[18].

[16] http://www.inec.go.cr/multimedia/encuesta-nacional-de-ingresos-y-gastos-de-los-hogares-2013-enigh.

[17] http://www.digestyc.gob.sv/phocadownload/DIVISION_DE_ESTADISTICAS_SOCIALES/Publicacion_EHPM_2011.pdf.

[18] http://old.mag.gob.sv/index.php?option=com_phocadownload&view=category&id=35&Itemid=229.

There are also four factors of production: skilled and unskilled labor, land, and capital. Land is incorporated within the matrix by region, allowing a regional consideration of agricultural production. Household incomes are also regionalized.

Guatemala

The SAM built by Piñeiro and Elverdin is for 2012. It is disaggregated into 65 sectors, corresponding to 91 activities, which include 14 agricultural activities. Labor data are separated by region (rural and urban), skill level (skilled and unskilled), and sector (formal and informal). For this, data of the 2011 Living Conditions Survey[19] were used. The same survey was used to disaggregate household consumption by activity, region (rural and urban), sector, and poverty level used (not poor, not extremely poor, and extremely poor).

Honduras

The SAM built by Piñeiro and Elverdin is for 2012 and is disaggregated into 63 sectors. The factors of production are labor, capital, and land. Labor data, as for some of the other countries, are disaggregated by activity, sector, skill level (skilled and unskilled), sector (formal and informal), and region (rural and urban). Family income is broken down by region and income quintile. The labor market data were obtained from the 2011 Permanent Household Survey[20]. For household consumption, the data are disaggregated by activity, region (rural and urban), and income quintile. Consumption data by sector were taken from the last expenditure survey available.

Nicaragua

In this case the SAM used is for 2006, was built by Piñeiro and Martínez, and was based on work done by the Central Bank of Nicaragua. The SAM includes land and capital and divides the labor factor by level of education and by being rural or urban. Finally, household incomes are regionalized to show geographical impacts.

The SAM is divided into 66 sectors and four geographical regions (Central, Atlantic, Pacific, and Managua). In turn, the families are disaggregated by rural and urban. Separately, there are also eight factors of production: labor, divided by primary, secondary, and tertiary education, and by zone (rural and urban); land; and capital.

Scenarios and Simulations

As noted, the base growth path (baseline) is the business-as-usual scenario, where the population and labor force grow at historical values (taken from World Bank 2015b). The economywide total-factor productivity growth rate is adjusted to match the historical GDP growth rate reported by the World Bank, and then is kept constant. Capital accumulation is endogenous with an assumed depreciation per year depending on the country studied (range from 3.7 to 5 percent per year).

The baseline is shocked by a global recession that leads to lower commodity prices and a decline in remittances and capital flows to Central American countries, as discussed below. That shocked baseline is then analyzed considering adjustments in potential policy levers.

The global shock includes three components. First, lower global growth leads to a decline of international prices for traded goods equivalent to the average effects of global recessions on international prices during the last four decades. The decline was imposed in the first year of the scenario and kept at that level for the second year; then prices are assumed to increase to the previous nominal values in equal steps during the next two years (third and fourth year). From the fifth year onward, international prices of all commodities stay at the nominal values of the base year. The second component is the effect of a

[19] https://www.ine.gob.gt/index.php/encuestas-de-hogares-y-personas/condiciones-de-vida.

[20] http://www.ine.gob.hn/index.php/25-publicaciones-ine/87-encuesta-permanente-de-hogares-de-propositos-multiples-ephpm.

decline in growth in the United States on the levels of remittances to Central American countries. It is assumed that the shock is equivalent to half of the reduction in remittances observed in the last recession in 2009 in each country. As in the case of international prices, the impact is considered to happen in the first year of the scenario and kept at the same level for the second year. Then remittances recover in installments during the following five years, until they return to the levels before the shock. The third component is a decline in capital flows to Central America because of a "flight to quality" given increases in uncertainty in global markets. We used the reduction observed in the 2008–2009 recession for this scenario, following the same recovery pattern as the previous two other components of the global shock.

The global shock is run under two policy settings related to exchange rates. Given the tendency in Central American countries to try to maintain stable values for that variable, we run one scenario with fixed exchange rates (SIM6, "EXR Fix") and the other (SIM3, "EXR Flex") with flexible exchange rates. In the case of El Salvador, which has adopted the US dollar as the domestic currency, the simulation of a flexible exchange rate is just a notional exercise.

The last two simulations show two possible interventions to help deal with the recession: one that focuses on policies to strengthen the safety net for the poor (SIM7, "Poverty") and another that applies a more general macroeconomic stimulus to try to cushion the shock (SIM8, "Aggregate Demand"). For Honduras, Guatemala, Nicaragua, and Costa Rica, these two simulations are run with a flexible exchange rate, while for El Salvador, they are run under dollarization (a permanently fixed exchange rate).

The first policy simulation (SIM7, "Poverty") considers a government transfer to the poorest families in each country, attempting to compensate them for lost income as a consequence of the negative external shock. The size of the transfers is calculated to compensate the chosen families for their lost income comparing the levels those families would have under the global shock (under flexible exchange rates for all countries except El Salvador) and the baseline. The specific definition of poor families is discussed in the simulations. These transfers are financed in the simulations by a loan from the concessional windows of multilateral and bilateral institutions.[21]

The other policy simulation (SIM8, "Aggregate Demand") focuses on supporting private consumption and total investment, through a tax cut plus a modest increase in public investment. Regarding the first aspect, the prerecession income tax is reduced by 33 percent the first year; it is kept at that level in the second year; and it then returns to the original rate gradually over the course of the next five years. At the same time, government savings are allowed to change so as to finance the increased public investment (over what would have been the benchmark level) of 0.5 percent of GDP for two years; over the next five years, the extra public investment imposed in the first two years of the simulation is reduced gradually. The tax cut and the modest increase in public investment increase the public deficit, which is assumed to be financed by unconventional monetary policy. Table 4.1 shows the closures for the different simulations.

[21] Given the usual terms and conditions for concessional loans, it is assumed that the repayment of the debt falls outside the 10-year period of the projections.

Table 4.1 Closures

Costa Rica, Guatemala, Honduras, and Nicaragua				El Salvador		
	SIM3 and SIM7	SIM6	SIM8	SIM3 and SIM7	SIM6	SIM8
Investment and savings	Savings driven	Savings driven	Savings driven	Savings driven	Savings driven	Savings driven
Government deficit	Fixed	Fixed	Flexible	Fixed	Fixed	Flexible
Government income	Flexible	Flexible	Flexible	Flexible	Flexible	Flexible
External savings	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed
Exchange rate	Flexible	Fixed	Flexible	Fixed	Flexible	Fixed
Numeraire	CPI	ER	CPI	ER	CPI	ER
Factors of production						
Skilled labor	Full employment			Full employment		
Unskilled labor	Unemployment			Unemployment		
Land	Full use; mobile			Full use; mobile		
Capital	Full use; activity specific			Full use; activity specific		

Source: Authors.
Notes: CPI = consumer price index; ER = exchange rate.

For the external balance, in all simulations foreign savings are fixed, leaving the exchange rate to adjust. In the simulations where the exchange rate is assumed to be fixed, the internal reference price used as numeraire (in this case, the consumer price index) was allowed to adjust, making the exchange rate the numeraire. This specification allows us to consider what would be the impact of trying to face the external shocks simulated with a fixed exchange rate. The fiscal balance is kept fixed, except in SIM8, where the tax cut leads to declines in the overall public balance.[22] The closure for savings and investment assumes that the former drive the latter (a savings-driven closure), with fixed marginal saving propensities and a flexible investment demand.

Factor market closure defines the operation of factor markets. Although it varies by country, depending on data availability, labor is mostly disaggregated by qualification (skilled and unskilled), sector (formal and informal), and/or region (rural and urban). Labor can be utilized in different sectors according to labor demand. Skilled labor is assumed to be fully employed and wages are the equilibrating variable. On the other hand, we assume that there is a perfectly elastic supply of unskilled labor at a fixed minimum wage, at least over the range of solutions that we analyze. Therefore, the level of employment of unskilled labor is endogenous.

Capital is activity specific with returns determined endogenously, and it is fully employed. We assume land is in full employment and that there is no increase in its supply. All simulations except the one with a fixed exchange rate use as numeraire the consumer price index.

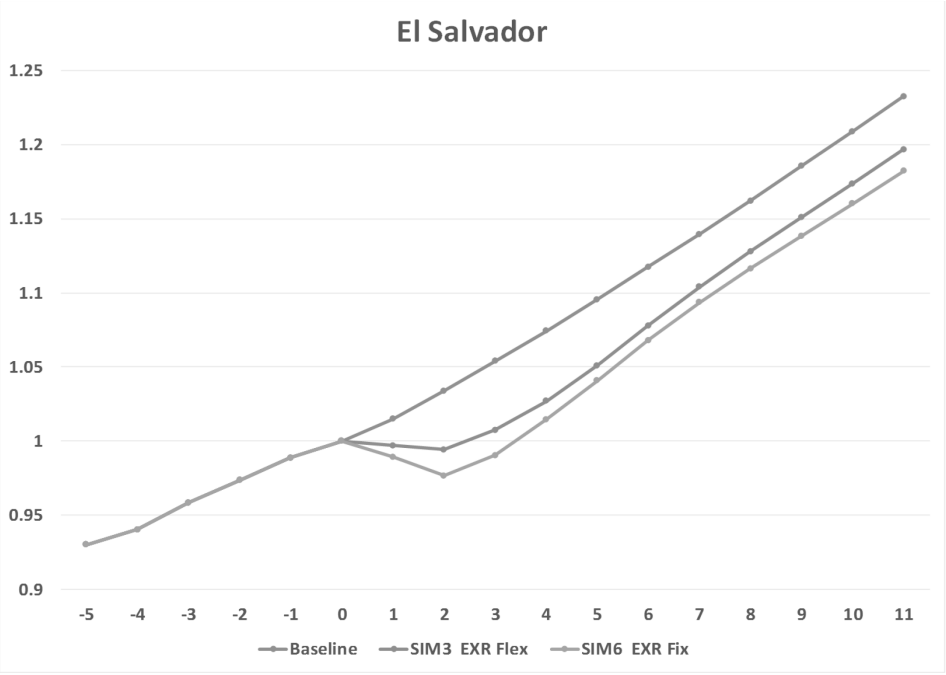
[22] It should be noted that the transfer to poor families in SIM7 also increases the overall deficit; the closure here refers to the rest of the fiscal deficit, which is kept fixed, while the transfer, as noted, is financed by a concessional loan.

5. RESULTS

Fixed versus Flexible Exchange Rates

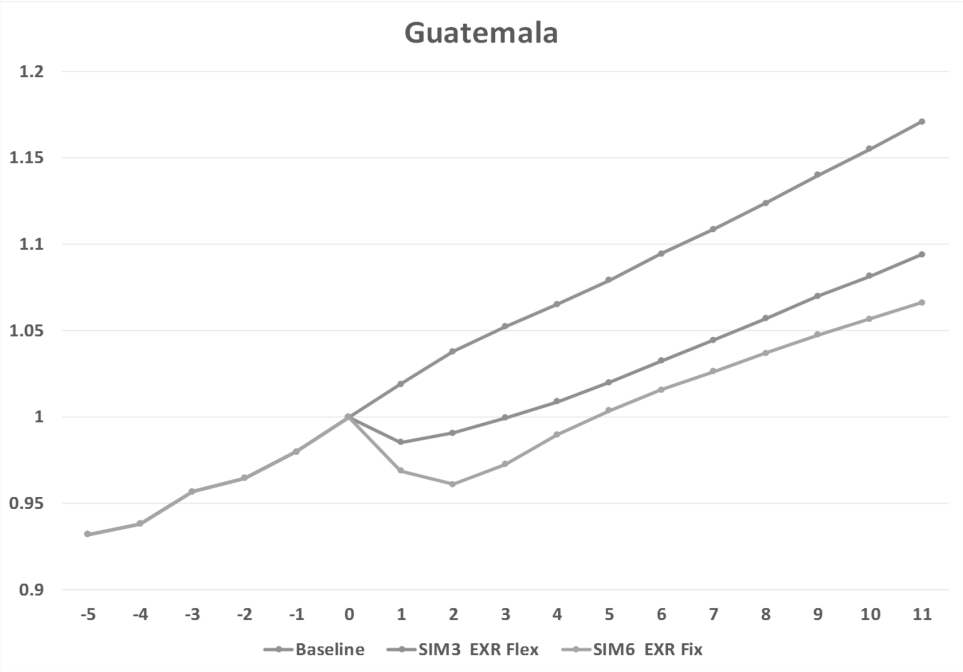
The first policy response we consider is the comparison between facing the shocks with a fixed or a flexible exchange rate. Figures 5.1 through 5.5 show the evolution of GDPpc (in constant values of the domestic currency) in all countries comparing both policies. The charts are presented in indexes where the year before the shock is labeled as time zero (0). The first year of the shock is +1 and the projections continue for a decade (until +11). As a reference, the figures include five years before year zero (-1 to -5) based on the real evolution of the economy of each country before the year zero (assumed to be 2014–2015). Then the baseline continues without shocks, while the other two lines reflect the evolution of the countries with the global shocks described before under fixed and flexible exchange rates.

Figure 5.1 GDPpc, fixed versus flexible exchange rates, El Salvador



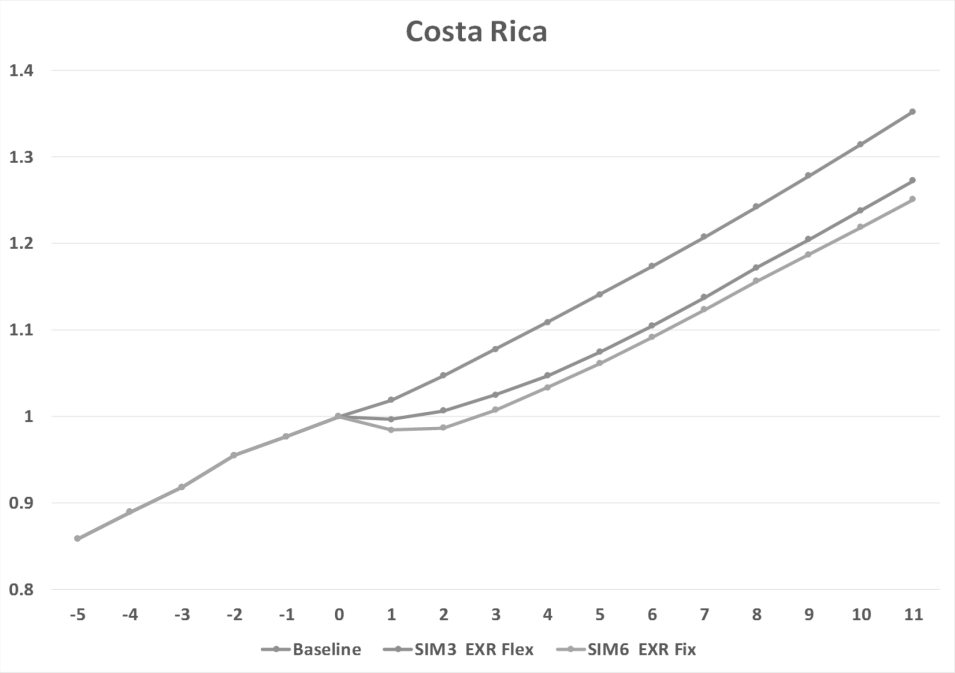
Source: Authors' worksheets.
Notes: GDPpc = gross domestic product per capita.

Figure 5.2 GDPpc, fixed versus flexible exchange rates, Guatemala



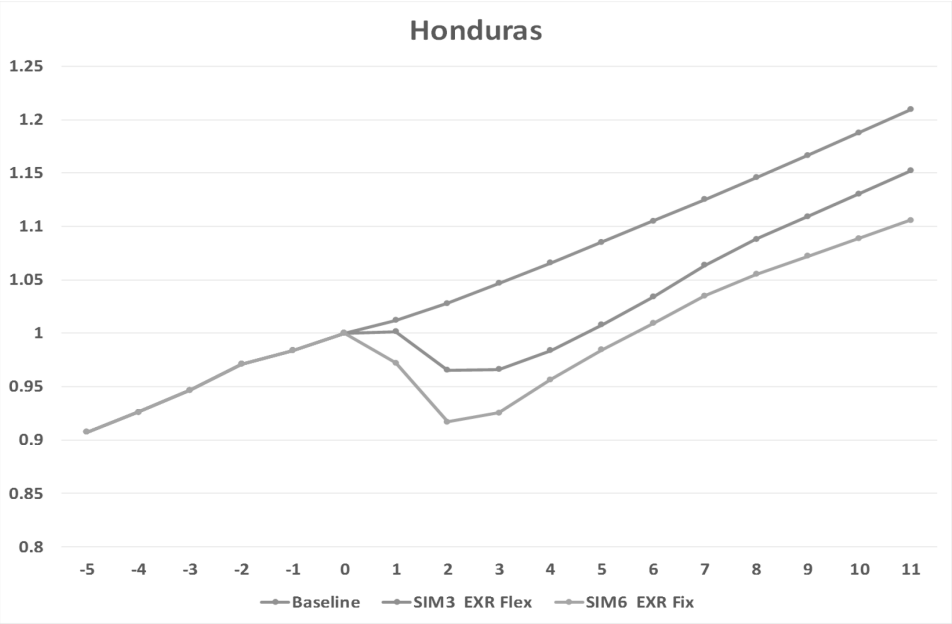
Source: Authors' worksheets.
Notes: GDPpc = gross domestic product per capita.

Figure 5.3 GDPpc, fixed versus flexible exchange rates, Costa Rica



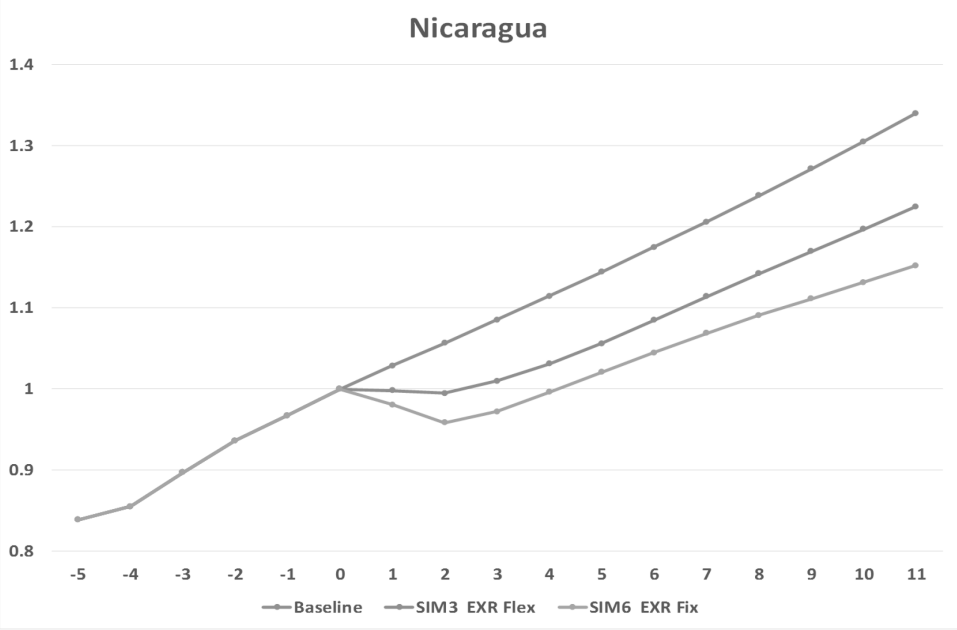
Source: Authors' worksheets.
Notes: GDPpc = gross domestic product per capita.

Figure 5.4 GDPpc, fixed versus flexible exchange rates, Honduras



Source: Authors' worksheets.
Notes: GDPpc = gross domestic product per capita.

Figure 5.5 GDPpc, fixed versus flexible exchange rates, Nicaragua



Source: Authors' worksheets.
Notes: GDPpc = gross domestic product per capita.

As noted before, each country's GDPpc growth follows a similar path as in the 2009 recession: although the economy recovers and eventually surpasses its level in the year of the recession, it stays below the previous trend (see Figure 2.2). The persistence of the negative effects of the shocks, noticeable in the 2009 crisis, is also captured in the simulations, where, in general, even with the policies considered

the path for GDPpc stays below the baseline without shocks, at least for the period considered in the simulations.

However, the impacts of those policies are different: in all cases, a flexible exchange rate delivers better results in terms of GDPpc, by softening the overall economic impact of the external shocks. This is in line with most traditional analyses that emphasize the advantages of exchange rate flexibility to absorb the type of real (as opposed to monetary) external shocks suffered by developing countries (see a more detailed discussion in Díaz-Bonilla 2015, chapter 10).

Theoretical studies generate a variety of results regarding whether fixed or flexible exchange rates are better for developing countries (or for any country, for that matter), depending on several factors:

- what the meaning of "better" is—answers may differ if the policymaker is concerned more about inflation or growth or the probability of crises;
- how rigid prices and wages are and whether there may be some other nominal rigidities in the economy;
- the extent of "dollarization" in the economy (as discussed subsequently);
- how exchange rate policy is coordinated with the whole macroeconomic policy framework, in particular the type of monetary policy implemented and the fiscal position;
- whether the capital account is open, closed, or something in between (that is, the type of constraints that can affect transactions in asset markets, segmenting the country from world financial markets); and
- what the nature of the shocks are—whether they come from the real economy (say, a drought) or whether they are nominal disturbances (such as increased inflationary pressures in a trading partner).

Table 5.1 (from Díaz-Bonilla 2015 and adjusted from Rogoff et al. 2004) summarizes some theoretical effects of flexible and fixed regimes on several economic dimensions (inflation, growth and volatility, and crises), mostly assuming economies with some level of rigidity in prices and wages.

Table 5.1 Economic performance across exchange rate regimes

Exchange Rate	Inflation	Growth and volatility	Crises
Fixed	May enhance monetary policy credibility and lower inflation if the fixed exchange rate (ER) is expected to last. But individual emerging markets are less likely to be able to import credibility only through a fixed ER (except by becoming members of a monetary union, such as the European Union). Moreover, inflation may be just repressed temporarily, but then reappear and lead to overvalued domestic currencies and sudden devaluation.	May reduce transaction costs and help increase trade. More trade may lead to improved productivity and higher growth. May also reduce domestic interest rates and uncertainty, also raising investment and growth. In general, it works better when shocks are nominal. On the other hand, it may increase volatility in the presence of real shocks and nominal rigidities, which negatively affects growth.	Higher risk of speculative attacks against currency, especially when exposed to volatile capital flows. Susceptibility to generalized debt and banking crises when the fixed ER has to be sharply adjusted in the face of shocks and macroeconomic imbalances.
Flexible	May lead to higher average inflation if the macroeconomic and institutional frameworks are weak. However, with stronger institutions and financial sectors the inflationary performance can be adequate.	May facilitate smoother adjustment and fewer distortions following real shocks (as opposed to nominal ones), therefore increasing growth. On the other hand, real exchange rate volatility may reduce trade and investments, reducing growth.	Lower risk of currency and banking crises.

Source: Díaz-Bonilla (2015), adapted from Rogoff et al. (2004).

The framework, however, does not say anything about what the rest of the policy framework is or the presence or absence of restrictions in asset markets. A main economic concern for full flexibility relates to the degree of dollarization of the economy, particularly in the banking system[23]: a strong devaluation may lead to financial distress for borrowers indebted in foreign currencies (mostly dollars in Central America), affecting in turn the solvency and liquidity of the banking system and generating panic among depositors that may want to withdraw their dollar deposits. Bankruptcies in the banking system may lead to the interruption of the payment system and deep economic crises. Since the current accounts began to be liberalized and the banking systems got more integrated in global markets, the most damaging economic crises in developing countries have been related to strong exchange rate devaluations, leading to banking crises in the context of partial dollarization of the economies (see, for instance, Reinhart and Rogoff 2009). Therefore, many developing countries display what has been called "fear of floating" (Calvo and Reinhart 2000). However, not allowing exchange rate adjustments earlier may lead to deeper adjustments later, with even more negative impacts on the banking system and the economy.

Therefore, a policy lesson is to avoid being placed in the situation where not much else can be done to restore macroeconomic balances other than to devalue, and the resulting devaluation ends up being sharper and more disruptive than if the exchange rate had been allowed to move earlier in order to stay closer to equilibrium values. When a country is hit by negative shocks, it is better to correct the exchange rate earlier rather than to let imbalances accumulate. In fact, in developing countries integrated with private international capital markets, fixed exchange rates appear associated with somewhat less growth, more inflation, and more banking and currency crises than managed floats; in particular, the probability of dual banking and currency crises (resulting from strong devaluations that affect debtors holding dollar liabilities) appears more than three times more likely under a fixed exchange rate than under other more flexible arrangements (Rogoff et al. 2004).

In these simulations, the average nominal depreciation with flexible exchange rates to absorb the shocks is between 3.5 percent (Costa Rica) and 6.5 percent (Nicaragua).[24] Of course, in the simulation for El Salvador the nominal devaluation is only notional, considering that the economy is already fully dollarized, and it would be economically and politically very difficult to reverse the present arrangement. Still, because it has to absorb the global shocks, the adjustment happens in the domestic prices (summarized in the consumer price index), which suffer from deflation (somewhat more than -4 percent in year one of the shock) and then return slowly to previous levels.

In the next two simulations (focusing on poverty transfers and a program to support private consumption and investment in general), El Salvador is considered to operate under a fully fixed nominal exchange rate, while the other four countries are assumed to follow a policy of a flexible nominal exchange rate.

Safety Nets

As mentioned, the policy simulation we discuss in this section (SIM7, "Poverty") considers a government transfer to the poorest families in each country. The transfers are quantified to compensate those families for the drop in incomes and consumption as a consequence of the negative external shock: in particular, the level of consumption by poor families in the baseline without a shock is compared with the incomes that they would have when affected by the global shock considered here. Those depressed income levels are calculated under flexible exchange rates for all countries except El Salvador, which is simulated under

[23] The level of dollarization varies in the countries considered. On the one hand, El Salvador is fully dollarized and cannot then devalue its currency. The other countries show different levels of dollarization, depending also on the type of indicator used (for different indicators of dollarization, see Reinhart, Rogoff, and Savastano 2003). Using the ratio of foreign currency deposits to total bank deposits (a common measure of dollarization), the levels range from above 90 percent in 2009 in Nicaragua, to about 50 percent in Costa Rica, to somewhat more than 30 percent in Guatemala and Honduras (see Cartas 2010).

[24] Given that the consumer price index is the numeraire, a real exchange rate defined as EXR/CPI would move similarly (the "foreign" consumer price index can be considered fixed and normalized to 1).

fixed exchange rates. Of course, the transfer would return the poor groups that are being compensated only to the levels they would have had in the baseline, which would still have been at poverty levels. Countries have different disaggregations of households in the SAMs; therefore, the size of the safety nets implemented are not necessarily comparable across countries. The specific definitions of poor groups by country are as follows:

- Costa Rica: rural Huetar and Chorotega, urban Huetar
- El Salvador: rural North, Central, and South
- Guatemala: extreme poor rural and urban
- Honduras: income quintiles 1 and 2 for urban and rural households
- Nicaragua: rural Atlantic and rural Central

As mentioned, the transfers are financed by concessional loans from multilateral and bilateral institutions. Table 5.2 shows the size of the loans needed to cover the gap to the baseline.

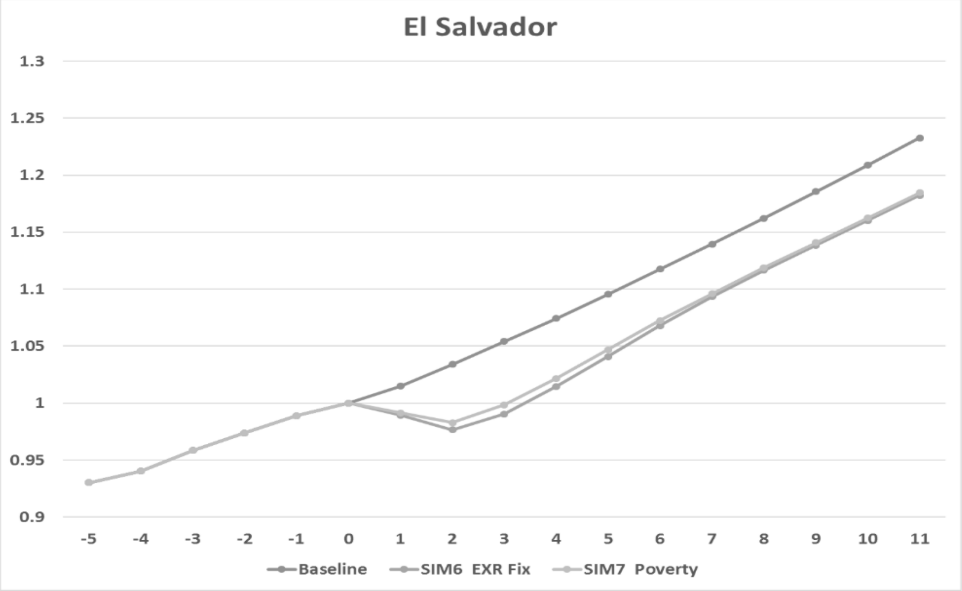
Table 5.2 Concessional loan as percentage of gross domestic product

Country	Average 2015–2019
Costa Rica	0.51
El Salvador	0.71
Guatemala	0.19
Honduras	0.33
Nicaragua	0.58

Source: Authors' worksheets.

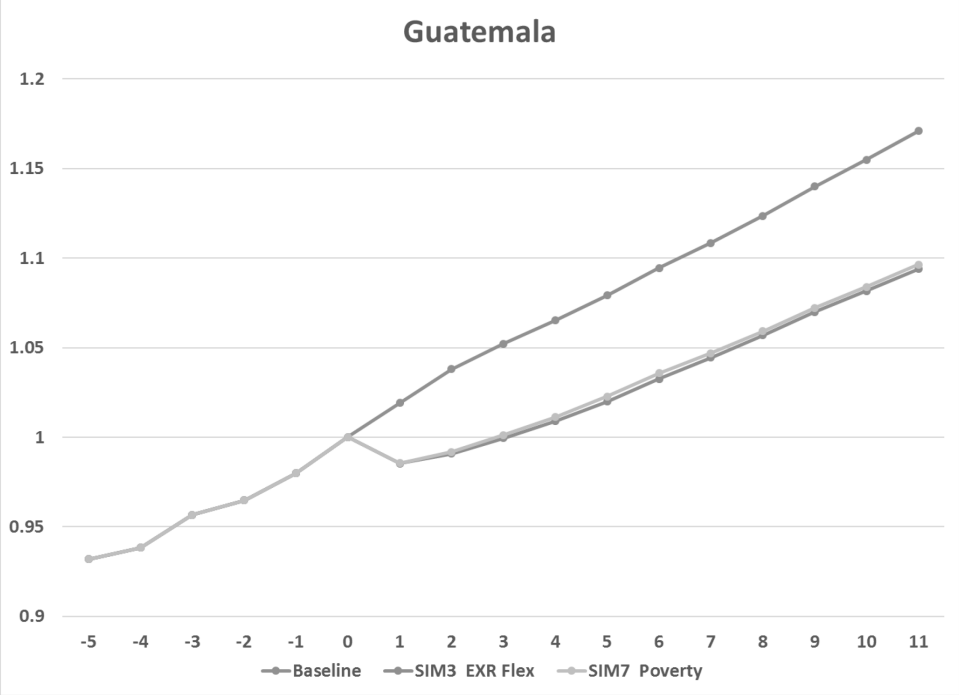
At the level of the whole economy, the differences in average GDPpc between the scenario with transfers to the poor and the one without transfers are small. Figure 5.6 shows the case of El Salvador (where the comparison is with the simulation with the global shock and fixed exchange rates), and Figure 5.7 shows Guatemala (here the comparison is with the scenario with the global shock and flexible exchange rates).

Figure 5.6 GDPpc, transfer versus exchange rate policy only, El Salvador



Source: Authors' worksheets.
Notes: GDPpc = gross domestic product per capita.

Figure 5.7 GDPpc, transfer versus exchange rate policy only, Guatemala



Source: Authors' worksheets.
Notes: GDPpc = gross domestic product per capita.

In both figures the scenario including transfers shows a small increase in average GDPpc in the economy (about 0.4 percent annually on average for the whole period of the simulations in El Salvador, and 0.2 percent in Guatemala; the average for all countries is less than 0.1 percent). This results from the multiplier effects of additional demand (admittedly, very small) from the poor.

Although the overall impact on average GDPpc is small, the beneficial impact on the poor families targeted is clearly larger. Table 5.3 shows the difference in consumption of poor families, considering the levels in the scenario with transfers[25] compared with the scenario without those transfers (which as noted, considers flexible exchange rates for all countries except El Salvador).

Table 5.3 Difference in consumption of poor families (percentage)

Country	Average during period of transfers
Costa Rica	3.7
El Salvador	5.1
Guatemala	4.6
Honduras	3.3
Nicaragua	6.0

Source: Authors' worksheets.

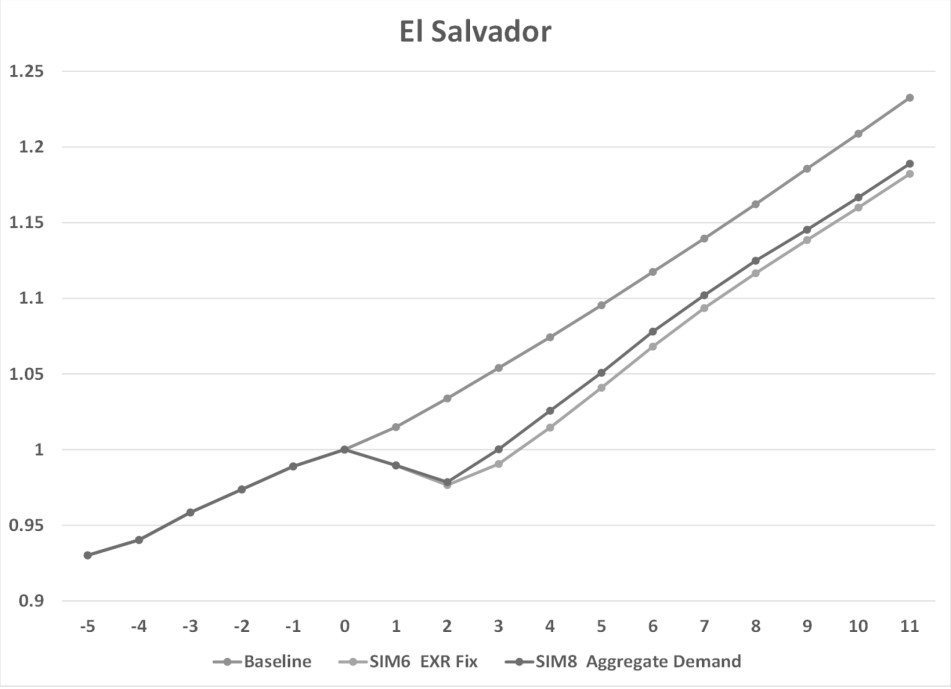
[25] It should be noted that the differences in consumption result not only from the transfers but also from the (small) expansion of economic activity and employment resulting from the multiplier effects on demand mentioned before.

Poor groups show higher levels of consumption of between 3.3 percent (Honduras) and 6 percent (Nicaragua). As mentioned before, because the definition of poor groups differs by country, the size of the external loans (Table 5.2) and the consumption effects (Table 5.3) cannot be compared across countries. It is also important to note the effect of the transfer on poor families in the transition period (or adjustment period), when the economy is recovering from the external shock: although that effect may not seem relevant at an aggregate level, the transfers are important for the poor families during that period.

Support to Private Consumption and Investment

The final policy scenario focuses on supporting aggregate demand by the private sector, through a macroeconomic stimulus based on an income tax cut and a moderate increase in public investment, both financed by unconventional monetary policy. It should be noted that the simulation in the case of El Salvador is only notional, given that the country does not have an independent monetary policy (therefore the stimulus would have to be financed by external support from multilateral and bilateral financial organizations). Figures 5.8 through 5.12 show the impact of those policies in each country, compared to both the baseline without the shock and the simulation with only the shock and the specific exchange rate policy followed (flexible for all countries, except El Salvador). It should be noted that the tax cuts (and therefore the simulations as a whole) are not comparable across countries because the amount of income tax as a percentage of GDP (and therefore the size of a 33 percent cut) is different in each country: Guatemala's income tax as a percentage of GDP is the smallest at 3.57 percent and Honduras the largest at 9.7 percent.[26]

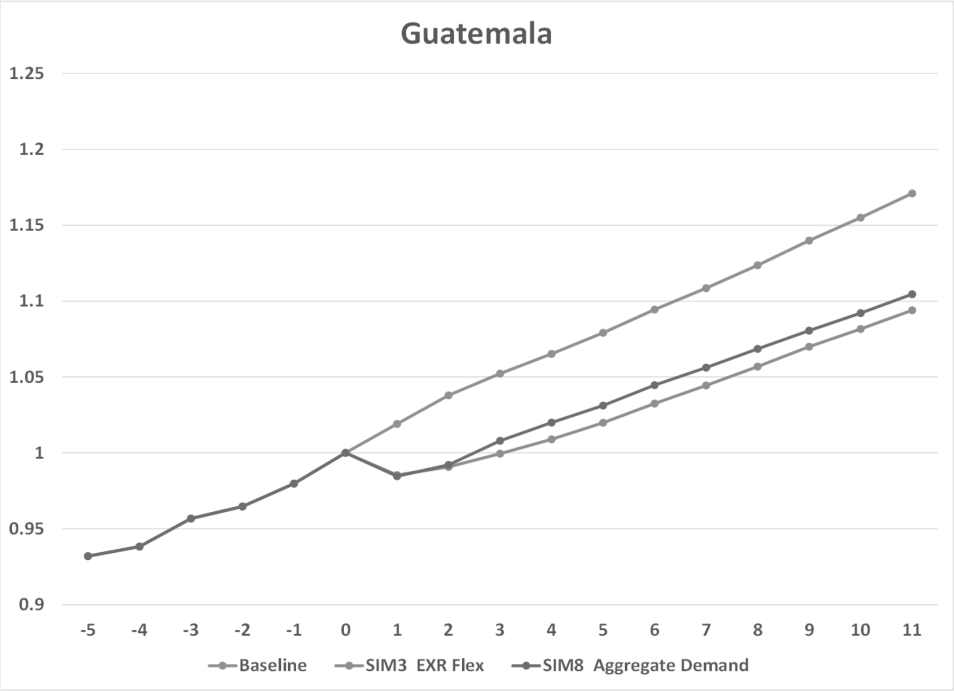
Figure 5.8 GDPpc, macroeconomic stimulus versus exchange rate policy only, El Salvador



Source: Authors' worksheets.
Notes: GDPpc = gross domestic product per capita.

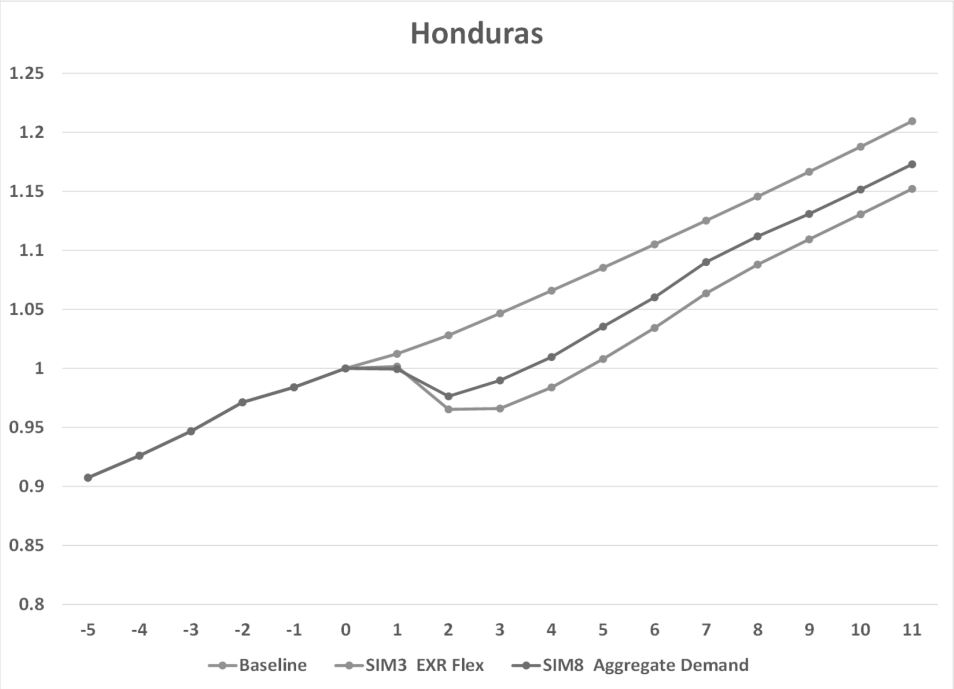
[26] Costa Rica, 5.0 percent; El Salvador, 4.4 percent; and Nicaragua, 4.1 percent.

Figure 5.9 GDPpc, macroeconomic stimulus versus exchange rate policy only, Guatemala



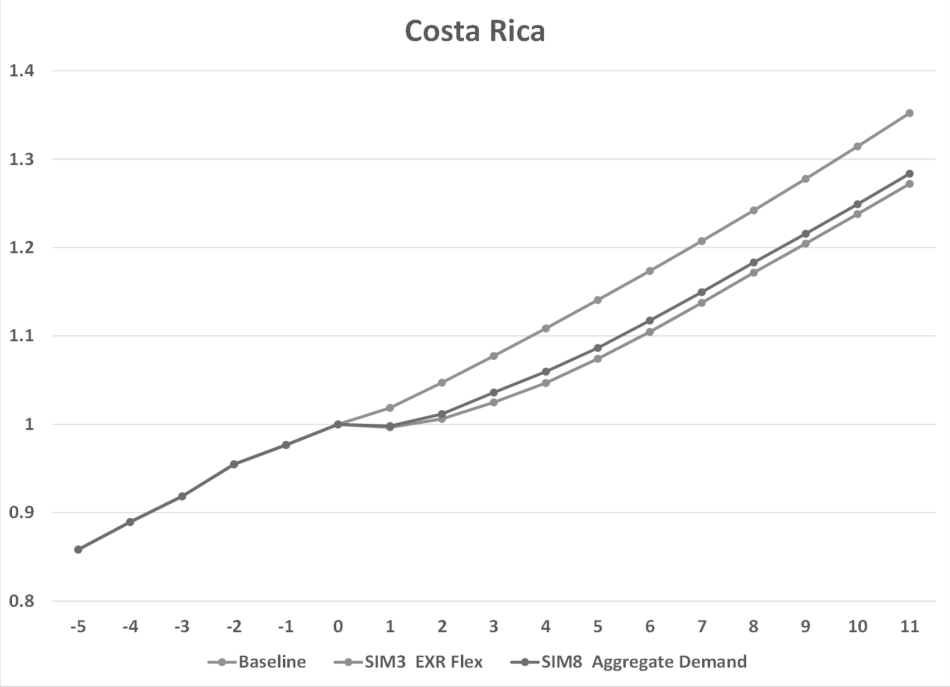
Source: Authors' worksheets.
Notes: GDPpc = gross domestic product per capita.

Figure 5.10 GDPpc, macroeconomic stimulus versus exchange rate policy only, Honduras



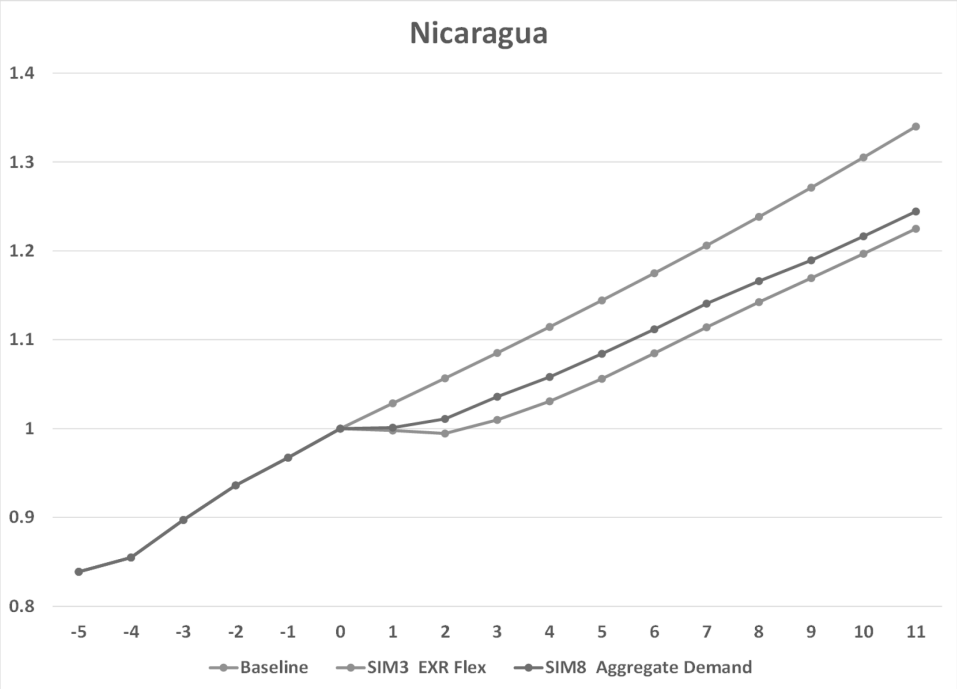
Source: Authors' worksheets.
Notes: GDPpc = gross domestic product per capita.

Figure 5.11 GDPpc, macroeconomic stimulus versus exchange rate policy only, Costa Rica



Source: Authors' worksheets.
Notes: GDPpc = gross domestic product per capita.

Figure 5.12 GDPpc, macroeconomic stimulus versus exchange rate policy only, Nicaragua



Source: Authors' worksheets.
Notes: GDPpc = gross domestic product per capita.

In all cases the macroeconomic stimulus improves the performance of the economies, allowing GDPpc to be higher (SIM8) than in the case of the shock alone (SIM3). By year five of the stimulus, GDPpc is higher, between 1 percent in El Salvador and 2.7 percent in Honduras and Nicaragua, with the other countries in between.

Table 5.4 shows the size of the stimulus as a percentage of GDP (on average during the period it is being applied) and the multiplier in terms of additional GDP obtained from the macroeconomic stimulus. The macroeconomic expansion is, on average, between 0.7 percent to almost 2 percent of total GDP. For Honduras, Guatemala, and Nicaragua, the multiplier implies impacts that are 20 to 50 percent larger than the size of the intervention (while in Costa Rica and El Salvador they are equal to the macroeconomic expansion). It should be noted that the size of the multiplier is limited by the assumptions of full employment of skilled labor, capital, and land (and the latter is fixed). Under specifications that allow for expansion in the use of factors, the impacts would be larger (this applies to all simulations).

Table 5.4 Size of the stimulus as a percentage of GDP

Country	Average stimulus (% of GDP)	Multiplier 2016–2021
Costa Rica	1.0	1.0
El Salvador	0.9	1.0
Guatemala	0.7	1.3
Honduras	1.9	1.2
Nicaragua	1.6	1.5

Source: Authors' worksheets.

Notes: The multiplier is the average percentage increase in total GDP during the period of the stimulus divided by the average stimulus during that period measured as a percentage of the GDP as well.

If the comparison is made against the scenario with the negative shock and fixed exchange rate (Table 5.5), the improvements in GDPpc are larger,[27] showing the combined effect of the macro stimulus and flexibility in the exchange rate (as noted, all the simulations for El Salvador are run with a fixed exchange rate).

Table 5.5 Increase in GDP per capita (in constant values)

Country	Percentage increase in GDPpc
Costa Rica	2.8
El Salvador	0.8
Guatemala	3.3
Honduras	6.5
Nicaragua	11.8

Source: Authors' worksheets

Notes: GDPpc = gross domestic product per capita. Five-year average after shock, compared to fixed exchange rate and no stimulus.

[27] The GDP increase in Table 5.4 is against the past (and it is total GDP), while the GDP increase in Table 5.5 is against the counterfactual scenario of shocks and fixed exchange rates (and it is GDP per capita).

6. CONCLUSION

The paper offers an ex ante evaluation of the impacts of potential global macroeconomic scenarios within the next few years, and of the possible policy responses to support economic activity and improve social indicators, in five Central American countries: Costa Rica, El Salvador, Guatemala, Honduras, and Nicaragua.

A review of the economic and social evolution of the last decades in those countries finds that the global economic and political problems of the 1980s and the 2009 world recession both negatively affected economic growth and incomes per capita in Central America, although the decline in the 1980s was deeper.

In considering potential global economic scenarios, and the channels through which they may affect the five Central American countries, we focus on a global scenario that includes further deceleration of world growth, lower commodity prices, and a decline in remittances and capital flows to those countries. Compared with experience since 2007–2008, we do not consider the type of price spikes in commodities that happened in 2008 and 2011 to be likely.

We simulate those scenarios and related policy issues using a recursive dynamic CGE model for the countries considered. First, a baseline growth path without the shock is projected. That baseline is shocked by a global recession, which, as indicated, leads to lower commodity prices and a decline in remittances and capital flows to Central American countries. That shocked baseline is then analyzed considering adjustments in potential policy levers.

The global shock is run under two policy settings related to exchange rates: given the tendency in Central American countries to try to maintain stable values for that variable, we run one scenario with fixed exchange rates (SIM6, "EXR Fix") and the other (SIM3, "EXR Flex") with flexible exchange rates (because El Salvador has adopted the US dollar as the domestic currency, its simulation of a flexible exchange rate is just indicative).

The impacts of those policies are different: in all cases, a flexible exchange rate delivers better results in terms of GDPpc, by softening the overall economic impact of the external shocks. This is in line with most traditional analyses that emphasize the advantages of exchange rate flexibility to absorb the type of external shocks suffered by developing countries. When a country is hit by negative shocks, it is better to correct the exchange rate earlier rather than to let imbalances accumulate.

Two further simulations show two possible interventions to help deal with the recession: one that focuses on policies to strengthen the safety net for the poor (SIM7, "Poverty") and another that applies a more general macroeconomic stimulus to try to cushion the shock (SIM8, "Aggregate Demand"). For Honduras, Guatemala, Nicaragua, and Costa Rica, we run the two simulations with a flexible exchange rate, while for El Salvador, it is done under dollarization (a permanently fixed exchange rate).

The first of those two simulations considers a government transfer to the poorest families in each country, in an attempt to compensate them for lowered incomes as a consequence of the negative external shock. The transfers are financed in the simulations by a loan from the concessional windows of multilateral and bilateral institutions.

In this simulation, GDPpc in the countries, although increasing compared to the alternative of no poverty-based transfers, does not change much, but the poor groups targeted clearly improve their incomes and consumption, helping them the most during the years of the negative shocks.

The other policy simulation (SIM8, "Aggregate Demand") focuses on supporting private consumption and total investment, through a tax cut plus a modest increase in public investment, financed by unconventional monetary policy. Again, for El Salvador this option is only notional, given that the country does not have an independent monetary policy, and thus the stimulus would have to be financed by external support from multilateral and bilateral financial organizations. In all cases the macroeconomic stimulus improves economic performance, allowing GDPpc to be higher (SIM8) than in the case of the shock alone (SIM3).

In summary, facing a potential global downturn such as the one simulated here, those countries that have flexible exchange rates and the use of domestic monetary policies can use a mix of adjustment in exchange rates combined with targeted poverty transfers and macroeconomic stimulus to alleviate the shock. El Salvador, which lacks the exchange rate and monetary instruments, will require further support from multilateral and bilateral sources to soften the shock.

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Email: ifpri@cgiar.org